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OCTOBER - 2021

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1. INDIAN SOCIETY & POLITY

1. Farmers have Right to Protest, but can't block roads: SC

Why in News?

- The Supreme Court has said farmers protesting at Delhi borders against the three farm laws have the right to agitate but they cannot block roads indefinitely.

What is Protest?

- When a group, community, or even a person goes up to protest, it is usually to showcase their disapproval or demur against any action, policy, statement, etc of state or government or any organization.
- Mostly the flow of protest is driven through political waves that also demonstrate the collective organization of people to make the government or state address their issues and take steps to overcome them.
- Issues with ongoing protest in Delhi:
- The question as to the absolute nature of the right to protest is not even a question in the true sense here.
- We have seen the vandalism protest at Red Fort last year.
- Hence the rights mentioned above are subject to reasonable restrictions under 19 (2) and 19 (3) on grounds such as sovereignty and integrity of India, and public order.
- Right to Protest in India
- The right to protest is the manifestation of three FRs:
- Right to Freedom of Assembly
- Right to Freedom of Association and
- Right to Freedom of Speech
- The Constitution of India provides the right of freedom, given in Article 19 with the view of guaranteeing individual rights that were considered vital by the framers of the constitution.
- The Right to protest peacefully is enshrined in Article 19(1) (a) guarantees the freedom of speech and expression; Article 19(1) (b) assures citizens the right to assemble peaceably and without arms.
- In detail: Article 19(1)
- It states that All citizens shall have the right:
 - a) to freedom of speech and expression;

- b) to assemble peaceably and without arms;
 - c) to form associations or unions;
 - d) to move freely throughout the territory of India;
 - e) to reside and settle in any part of the territory of India; and
 - f) omitted
 - g) to practice any profession, or to carry on any occupation, trade or business
- Reasonable restrictions do exist in practice:
 - Fundamental rights do not live-in isolation. The right of the protester has to be balanced with the right of the commuter. They have to co-exist in mutual respect.
 - Article 19(2) imposes reasonable restrictions on this.
 - The court held it was entirely the responsibility of the administration to prevent encroachments in public spaces.

2. Supreme Court forms committee to examine Pegasus allegations

Why in News?

- The Supreme Court has appointed an independent expert technical committee overseen by a former apex court judge, Justice R.V. Raveendran, to examine allegations that the government used Israeli spyware, Pegasus, to snoop on its own citizens.

Why Need a committee?

- Decisions in cases seeking enforcement of fundamental rights are based on facts.
- The task of determining these facts, when they are disputed or unknown, are often assigned to committees, which act as an agent of the court.
- Such committees or fact-finding teams can summon individuals, prepare ground reports, and inform the court.
- The Pegasus case involves technical questions, and requires extensive fact-finding for the court to determine whether fundamental rights were violated, and to pass suitable orders.

— TO MAKE RECOMMENDATIONS —

<p>1 Regarding enactment or amendment of law and procedures on surveillance, and to secure improved right to privacy.</p> <p>2 Regarding enhancing and improving cyber security of nation and its assets.</p> <p>3 To ensure prevention of invasion of right to privacy, other than lawfully, by State and/or non-State entities using such spyware.</p> <p>4 Regarding establishment of a mechanism to flag suspicion of</p>	<p>illegal surveillance of devices.</p> <p>5 Regarding setting up a well-equipped independent premier agency to investigate cyber security vulnerabilities and cyberattacks, and assess cyberattack threats.</p> <p>6 Regarding any <i>ad hoc</i> arrangement for protection of citizen's rights until Parliament is able to fill the lacunae.</p> <p>7 On any ancillary matter the Committee may deem fit and proper. <i>(From SC order, edited)</i></p>
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Functions of the committee: / Pegasus:

- All spyware do what the name suggests — they spy on people through their phones.
- Pegasus works by sending an exploit link, and if the target user clicks on the link, the malware or the code that allows the surveillance is installed on the user's phone.

- A presumably newer version of the malware does not even require a target user to click a link.
- Once Pegasus is installed, the attacker has complete access to the target user's phone.

Why in News?

- The three-judge bench, headed by CJI N V Ramana rejected the government's plea to let it constitute an expert panel to investigate the issue.

What did the SC Rule?

- The SC order broadly addresses three issues that have been flagged in the Pegasus row:
- Citizen's right to privacy (Article 21)
- Judicial review when the executive invokes national security (Article 13, Article 32)
- (Article 13: declares that any law which contravenes any of the provisions of the part of Fundamental Rights shall be void.
- Articles 32 and 226 entrusts the roles of the protector and guarantor of fundamental rights to the Supreme and High Courts.)

Implications of surveillance on free speech:

a) Upholding Right to Privacy:

- The Court, pointing to its own judgment in K S Puttaswamy Case (2017) has said that "right to privacy (under Article 21) is as sacrosanct as human existence.
- It is inalienable to human dignity and autonomy.
- While agreeing that it is not an absolute right, the Court has said any restrictions "must necessarily pass constitutional scrutiny". Any surveillance or snooping done on an individual by the state or any outside agency is an infringement of that person's right to privacy.
- Hence, any violation of that right by the state, even in national interest, has to follow procedures established by the law.

b) Linking surveillance and censorship:

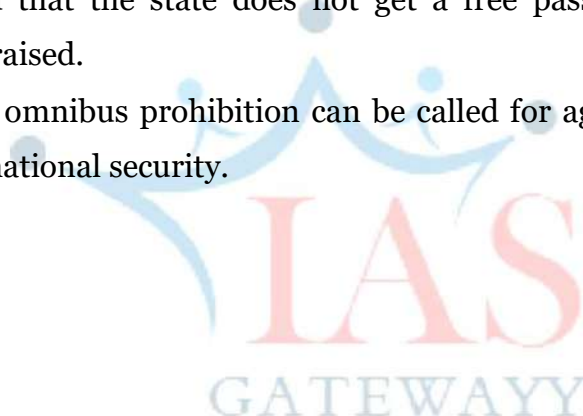
- The Court has also drawn a link between:
- Surveillance, especially the knowledge that one is under the threat of being spied on", and
- Censorship, particularly self-censorship, to reflect on the potential chilling effect that snooping techniques may have
- The chilling effect surveillance can produce, is an assault on the vital public-watchdog role of the press, which may undermine the ability of the press to provide accurate and reliable information.

c) Constituting a Panel:

- The Court has constituted a panel of experts under former SC judge Justice R V Raveendran.
- It has sharply defined the questions it needs to ask and find answers to: Was any Pegasus suite of spyware acquired by the central or any state government for use against the citizens of India.
- It would inquire under what law, rule, guidelines, protocol or lawful procedure was such deployment made.
- These are vital questions at the heart of a citizen's basic rights.

Significance of the Judgement:

- The order is a strong rebuttal of the government's specious and self-serving use of national security.
- The Court has ruled that the state does not get a free pass every time the spectre of 'national security' is raised.
- This also means "no omnibus prohibition can be called for against judicial review" if the matter impinges on national security.



2. GOVERNANCE

1. 2nd phase of SBM-U and AMRUT Mission

Why in News?

- The PM has launched the second phase of the Swachh Bharat Mission-Urban and Atal Mission for Rejuvenation and Urban Transformation.

Swachh Bharat Mission-Urban 2.0:

- The Mission will focus on ensuring complete access to sanitation facilities to serve additional populations migrating from rural to urban areas in search of employment and better opportunities over the next 5 years.
- Complete liquid waste management in cities in less than 1 lakh population to ensure that all wastewater is safely contained, collected, transported, and treated so that no wastewater pollutes our water bodies.
- Source segregation- Under Sustainable Solid Waste Management, greater emphasis will be on source segregation. Material Recovery Facilities and waste processing facilities will be set up, with a focus on phasing out single-use plastic.
- Construction & demolition waste processing facilities will be set up.
- Mechanical sweepers deployed in National Clean Air Programme cities and in cities with more than 5 lakh population.
- Remediation of all legacy dumpsites will be another key component of the Mission.

AMRUT 2.0:

- Water management: It will build upon the progress of AMRUT to address water needs, rejuvenate water bodies, better manage aquifers, reuse treated wastewater, thereby promoting circular economy of water.
- Water supply: It would provide 100% coverage of water supply to all households in around 4,700 ULBs.
- Sewerage: It will provide 100% coverage of sewerage and septage in 500 AMRUT cities.
- Rejuvenation of water bodies and urban aquifer management: It will be undertaken to augment sustainable fresh water supply.
- Recycle and reuse of treated wastewater: It is expected to cater to 20% of total water needs of the cities and 40% of industrial demand.
- Pey Jal Survekshan: It will be conducted in cities to ascertain equitable distribution of water, reuse of wastewater and mapping of water bodies.

2. BSF Powers and Jurisdiction

Why in News?

- The Ministry of Home Affairs (MHA) has extended the jurisdiction of the Border Security Force (BSF) up to 50 km inside the international borders in Punjab, West Bengal and Assam.

Border Security Force (BSF):

- The BSF is India's border guarding organization on its border with Pakistan and Bangladesh.
- It comes under the Ministry of Home Affairs.
- It was raised in the wake of the 1965 War on 1 December 1965 for ensuring the security of the borders of India and for matters connected therewith.
- The BSF has its own cadre of officers but its head, designated as a Director-General (DG), since its raising has been an officer from the Indian Police Service (IPS).

What are the New Modifications?

- The MHA has exercised the powers under the Border Security Force Act of 1968.
- It has thus outlined the area of BSF's jurisdiction.
- While the places marked here are within 50 km of the respective borders, this is not meant to represent the BSF's jurisdiction.
- At the same time, the Ministry has reduced BSF's area of operation in Gujarat from 80 km from the border, to 50 km.

Powers Exercised by BSF in its Jurisdiction:

- BSF's jurisdiction has been extended only in respect of the powers it enjoys under:
- Criminal Procedure Code (CrPC)
- Passport (Entry into India) Act, 1920 and
- Passport Act, 1967

Arrest and search:

- BSF currently has powers to arrest and search under these laws.
- It also has powers to arrest, search and seize under the NDPS Act, Arms Act, Customs Act and certain other laws.
- Its powers under these will continue to be only up to 15 km inside the border in Punjab, Assam and West Bengal, and will remain as far as 80 km in Gujarat.

Sanctions behind Such Powers:

- Scarcely populated borders: At that time, border areas were sparsely populated and there were hardly any police stations for miles.
- Trans-border crimes: To prevent trans-border crimes, it was felt necessary that BSF is given powers to arrest.
- Manpower crunch: While police stations have now come up near the border, they continue to be short-staffed.
- Various issues at Borders:
 - ✓ Encroachment
 - ✓ Illegal incursion
 - ✓ Drug and cattle smuggling

Why has the Government extended the Jurisdiction?

- The objective of the move is to bring in uniformity and also to increase operational efficiency. Earlier BSF had different jurisdictions in different states.
- BSF often gets information relating to crime scenes that may be out of their jurisdiction.
- The move was also necessitated due to increasing instances of drone-dropping of weapons and drugs.

3. What the low rank on the Global Hunger Index means for India

Why in News?

- This year's Global Hunger Index (GHI) ranks India 101 out of 116 countries for which reliable and comparable data exist.

Government's stand:

- Is India's performance on hunger as dismal as denoted by the index or is it partly a statistical artefact?
- This question assumes immediacy, especially since the government has questioned the methodology and claimed that the ranking does not represent the ground reality.
- This calls for careful scrutiny of the methodology, especially of the GHI's components.

Understanding the GHI methodology:

- The GHI has four components.
- The first — insufficient calorie intake — is applicable for all age groups.
- The data on deficiency in calorie intake, accorded 33% weight, is sourced from the Food and Agriculture Organization's Suite of Food Security Indicators (2021).

- The remaining three — wasting (low weight for height), stunting (low height for age) and mortality — are confined to children under five years.
- The data on child wasting and stunting (2016-2020), each accounting for 16.6% of weight, are from the World Health Organization, UNICEF and World Bank, complemented with the latest data from the Demographic and Health Surveys.
- Under-five mortality data are for 2019 from the UN Inter-Agency Group for Child Mortality Estimation.

Issues with GHI:

- The GHI is largely children-oriented with a higher emphasis on undernutrition than on hunger and its hidden forms, including micronutrient deficiencies.
- The first component — calorie insufficiency — is problematic for many reasons.
- The lower calorie intake, which does not necessarily mean deficiency, may also stem from reduced physical activity, better social infrastructure (road, transport and healthcare) and access to energy-saving appliances at home, among others.
- For a vast and diverse country like India, using a uniform calorie norm to arrive at deficiency prevalence means failing to recognise the huge regional imbalances in factors that may lead to differentiated calorie requirements at the State level.
- Understanding the connection between stunting and wasting and ways to tackling them
- India's wasting prevalence (17.3%) is one among the highest in the world.
- Its performance in stunting, when compared to wasting, is not that dismal, though.
- Child stunting in India declined from 54.2% in 1998–2002 to 34.7% in 2016-2020, whereas child wasting remains around 17% throughout the two decades of the 21st century.
- Stunting is a chronic, long-term measure of undernutrition, while wasting is an acute, short-term measure.
- Quite possibly, several episodes of wasting without much time to recoup can translate into stunting.
- Effectively countering episodes of wasting resulting from such sporadic adversities is key to making sustained and quick progress in child nutrition.
- Way forward: If India can tackle wasting by effectively monitoring regions that are more vulnerable to socioeconomic and environmental crises, it can possibly improve wasting and stunting simultaneously.
- Low child mortality

- India's relatively better performance in the other component of GHI — child mortality — merits a mention.
- Studies suggest that child undernutrition and mortality are usually closely related, as child undernutrition plays an important facilitating role in child mortality.
- However, India appears to be an exception in this regard.
- This implies that though India was not able to ensure better nutritional security for all children under five years, it was able to save many lives due to the availability of and access to better health facilities.

Conclusion:

- The low ranking does not mean that India fares uniformly poor in every aspect. This ranking should prompt us to look at our policy focus and interventions and ensure that they can effectively address the concerns raised by the GHI, especially against pandemic-induced Nutrition Insecurity.

4. The outlines of a national security policy

Why in News?

- National security concepts have, in the two decades of the 21st century, undergone fundamental changes. Cyberwarfare has vastly reduced the deterrent value of conventional deterrents.

Emergence of Cyberwarfare:

- In the 21st century, after cybertechnology enters as an important variable in nations' defence policies.
- Geographical land size or GDP size will be irrelevant in war-making capacity or deterrence.
- These fundamental changes are entirely due to the earlier 20th century innovations in cybertechnology and software developments.
- Drones, robots, satellites and advanced computers as weapons are already in use.
- Some examples of further innovations are artificial intelligence and nanotechnology.
- Tracking those cyber warfare threat will need a new national security policy.
- By credible accounts, China, recently, publicly cautioned Indians to sit up and take notice by using cybertechnology to shut down Mumbai's electric supply in populated areas of the city, for a few hours.

Four Dimensions of National Security Policy:

- **Objectives:** the objective of the National Security Policy in the 21st century is to define what assets are required to be defended, the identity of opponents.
- Although the novel coronavirus is perhaps accidental, it has completely destabilised peoples globally and their governments in all nations of the world over.
- This is a preview of the kinds of threats that await us in the coming decades which a national security policy will have to address by choosing a nation's priorities.
- **Priorities:** National security priorities will require new departments for supporting several frontiers of innovation and technologies such as hydrogen fuel cells, desalination of seawater, thorium for nuclear technology, anti-computer viruses, and new immunity-creating medicines.
- This focus on a new priority will require compulsory science and mathematics education, especially in applications for analytical subjects.
- **Strategy:** The strategy required for this new national security policy will be to anticipate our enemies in many dimensions and by demonstrative but limited pre-emptive strikes by developing a strategy of deterrence of the enemy.
- For India, it will be the China cyber capability factor which is the new threat for which it has to devise a new strategy.
- Resource mobilisation: The macroeconomics of resource mobilisation depends on whether a nation has 'demand' as an economic deficit or not.
- If demand for a commodity or service is in deficit to clear the market of the available supply of the same, then liberal printing of currency and placing it in the hands of consumers is recommended for the economy to recover the demand-supply parity.
- A way to increase demand is by lowering the interest rate on bank loans or raising the rates in fixed deposits which will enable banks to obtain liquidity and lend liberally for enhancing investment for production.
- If it is 'supply' that is short or in deficit compared to demand, then special measures are required to incentivise to encourage an increase in supply.

5. Ayushman Bharat Health Infrastructure Mission

Why in News?

- PM has launched the Ayushman Bharat Health Infrastructure Mission (AB-HIM), one of the largest pan-India schemes for Strengthening Healthcare Infrastructure.



AB- Health Infrastructure Mission:

- AB-HIM is being rolled out as India's largest scheme to scale up health infrastructure.
- It is aimed at ensuring a robust public health infrastructure in both urban and rural areas, capable of responding to Public Health Emergencies or Disease Outbreaks.

Key Features:

- Health and Wellness Centres: In a bid to increase accessibility it will provide support to 17,788 rural HWC in 10 'high focus' states and establish 11,024 urban HWC across the country.
- Exclusive Critical Care Hospital Blocks: It will ensure access to critical care services in all districts of the country with over five lakh population through 'Exclusive Critical Care Hospital Blocks'.
- Integrated public health labs: will also be set up in all districts, giving people access to "a full range of diagnostic services" through a network of laboratories across the country.
- Disease surveillance system: The mission also aims to establish an IT-enabled disease surveillance system through a network of surveillance laboratories at block, district, regional and national levels.
- Integrated Health Information Portal: All the public health labs will be connected through this Portal, which will be expanded to all states and UTs, the PMO said.

Why is the Scheme Significant?

- India has long been in need of a ubiquitous healthcare system.
- A 2019 study has highlighted how access to public health care remained elusive to those living on the margins.
- The study found that 70 per cent of the locations have public healthcare services.
- However, availability was less in rural areas (65 per cent) compared to urban areas (87 per cent).
- In 45 per cent of the surveyed locations, people could access healthcare services by walking, whereas in 43 per cent of the locations they needed to use transport.

6. Karnataka Gambling Law: Ambit and the High Court Challenge

Why in News?

- Last month, the Karnataka legislature passed a legislation to amend the Karnataka Police Act, 1963, making all forms of gambling, including online, a cognisable and non-bailable offence.

Gambling Law:

- The Karnataka Police (Amendment) Act, 2021 was notified and came into force.
- It is aimed for broadening the scope of gambling beyond what has been defined by law.
- It was passed despite similar laws introduced in Tamil Nadu, Kerala and Telangana having faced legal challenges.
- What forms of gambling does the new law cover?
- The amended law covers all forms of wagering or betting “in connection with any game of chance” with the exception of horse racing and lotteries.
- It also puts betting on the skills of others in the category of gambling.
- It provides an exception only to any pure game of skill and not to “wagering by persons taking part in such game of skill”.

Penalties Prescribed:

- It enhances maximum punishment for owners of gambling centres from one year to three years of imprisonment and fines from Rs 1,000 to Rs 1 lakh.
- The minimum punishment proposed is six months instead of the current one month and the fine is Rs 10,000 instead of Rs 500.

Implications of the law:

- Since the new law came into effect, several online gaming firms have geo-locked their apps and sites in Karnataka to prevent attracting police action if customers access the sites.
- Legal issues raised by the amended laws
- One of the primary grounds on which the new gaming laws in these states has been challenged is: **Games of skill:** This been clubbed along with games of chance in the definition of gaming, if the games of skill are played for prizes or bets. Violation of FR: Gaming companies have argued – successfully that competitive games of skill are business activities protected under Article 19 (1) (g) of the Constitution.
- **Other examples:** Rummy and horse racing have been classified by the courts as games of skill that do not come under the purview of gaming laws.
- Competence of the state: It has been argued that states do not have “legislative competence” to prohibit games of skill and that only games of chance can be regulated for Gambling and Betting.

Why has Karnataka Amended the Law?

- Ban on online gambling: The statement of objects and reasons justify that the new law is needed to make gambling a cognisable and non-bailable offence (gambling in public streets remains cognisable and bailable).
- More power to Police: Other reasons cited is that police cannot raid gambling dens without a formal written order from a magistrate, since gambling is a non-cognisable and bailable offence. Public demands for ban: Recent public interest litigations seeking a ban on online gaming and betting, too, have been a trigger for the amendments.
- Illicit use of cyber-space: The new law has also been introduced to include the use of cyberspace as defined in the IT Act 2000 to curb the menace of gaming through internet.

Will these Amendments stand the test of law?

- As mentioned, a similar law in Tamil Nadu was struck down by the Madras High Court as being ultra vires after it was challenged by online gaming firms.
- The court ruled that- Games and sporting activities in the physical form cannot be equated with games conducted in virtual mode or in cyberspace. However, when it comes to card games or board games such as chess or Scrabble, there is no distinction between the skill involved in the physical form of the activity or in the virtual form.
- The HC said both rummy and poker are games of skill.

3. SCIENCE & TECHNOLOGY

1. Computer Tomography

Why in News?

- The first computed tomography image – a CT scan – of the human brain was made 50 years ago, on Oct. 1, 1971.

Computer Tomography (CT):

- A CT scan is a medical imaging technique used in radiology to get detailed images of the body noninvasively for diagnostic purposes.
- The multiple X-ray measurements taken from different angles are then processed on a computer using reconstruction algorithms to produce tomographic (cross-sectional) images (virtual “slices”) of a body.

How does it work?

- They use a narrow X-ray beam that circles around one part of your body. This provides a series of images from many different angles.
- A computer uses this information to create a cross-sectional picture. Like one piece in a loaf of bread, this two-dimensional (2D) scan shows a “slice” of the inside of your body.
- This process is repeated to produce a number of slices.
- The computer stacks these scans one on top of the other to create a detailed image of your organs, bones, or blood vessels.
- For example, a surgeon may use this type of scan to look at all sides of a tumor to prepare for an operation.

Its development:

- Since its development in the 1970s, CT has proven to be a versatile imaging technique.
- While CT is most prominently used in diagnostic medicine, it also may be used to form images of non-living objects. The 1979 Nobel Prize in Physiology or Medicine was awarded jointly to South African-American physicist Allan M. Cormack and British electrical engineer Godfrey N. Hounsfield “for the development of computer-assisted tomography”.

Threats:

- CT scans use X-rays, which produce ionizing radiation.
- Such radiation may damage your DNA and lead to cancer.
- The risk increases with every CT scan we get.
- Ionizing radiation may be more harmful in children.

2. Indian meteorite helps study Earth's formation

Why in News?

- The researchers from the Geological Survey of India collected about 30 meteorite fragments with the largest weighing around a kilogram near the town of Katol in Nagpur in 2012.

Significance of Meteor Study:

- Now, by studying the composition of these meteorite fragments, researchers have unraveled the composition expected to be present in the Earth's lower mantle which is at about 660 km deep.
- Studying the meteorite could also tell us more about how our Earth evolved from being a magma ocean to a rocky planet.

Key Component of the Meteor: Olivine

- Initial studies revealed that the host rock was mainly composed of olivine, an olive-green mineral.
- Olivine is the most abundant phase in our Earth's upper mantle.
- Our Earth is composed of different layers including the outer crust, followed by the mantle and then the inner core.

How to Study a Meteorite?

- The researchers took a small sample of the meteorite and examined it using special microscopy techniques.
- The mineralogy was determined using a laser micro-Raman spectrometer.
- These techniques helped the team identify, characterise the crystal structure of the meteorite and determine its chemical composition and texture.

What does the New Study Show?

- The international team of scientists examined a section of this highly-shocked meteorite. It resembles to the first natural occurrence of a mineral called bridgmanite.
- The mineral was named in 2014 after Prof. Percy W. Bridgman, recipient of the 1946 Nobel Prize in Physics.
- Various computational and experimental studies have shown that about 80% of the Earth's lower mantle is made up of bridgmanite.
- By studying this meteorite sample, scientists can decode how bridgmanite crystallized during the final stages of our Earth's formation.

- Bridgmanite: On Earth vs. on Meteorite
- Katol meteorite is a unique sample and it is a significant discovery.
- The bridgmanite in the meteorite was found to be formed at pressures of about 23 to 25 gigapascals generated by the shock event.
- The high temperature and pressure in our Earth's interior have changed over billions of years causing crystallisation, melting, remelting of the different minerals before they reached their current state.
- It is important to study these individual minerals to get a thorough idea of how and when the Earth's layers formed.
- How does it help understand evolution of Earth?
- The inner planets or terrestrial planets or rocky planets Mercury, Venus, Earth, and Mars are formed by accretion or by rocky pieces coming together.
- They were formed as a planet by increased pressure and high temperature caused by radioactive elements and gravitational forces.
- Our Earth was an ocean of magma before the elements crystallised and stabilised and the different layers such as core, mantle were formed.
- The heavier elements like iron went to the core while the lighter silicates stayed in the mantle.
- By using the meteorite as an analog for Earth, we can unearth more details about the formation.

3. Zeolite Oxygen Concentrators: Chemistry in 3-D

Why in News?

- To meet the demand of oxygen supply in the country during the peak of pandemic, the Defence Research and Development Organisation (DRDO) had chartered the Air India to import 'Zeolite' from different countries.

What are Zeolites?

- Zeolites are highly porous, 3-dimensional meshes of silica and alumina.
- In nature, they occur where volcanic outflows have met water.
- Synthetic zeolites have proven to be a big and low-cost boon.

Uses in Oxygen Concentrator:

- One biomedical device that has entered our lexicon during the pandemic is the oxygen concentrator.

- This device has brought down the scale of oxygen purification from industrial-size plants to the volumes needed for a single person.
- At the heart of this technology are synthetic frameworks of silica and alumina with nanometer-sized pores that are rigid and inflexible.
- Beads of one such material, zeolite 13X, about a millimeter in diameter, are packed into two cylindrical columns in an oxygen concentrator.

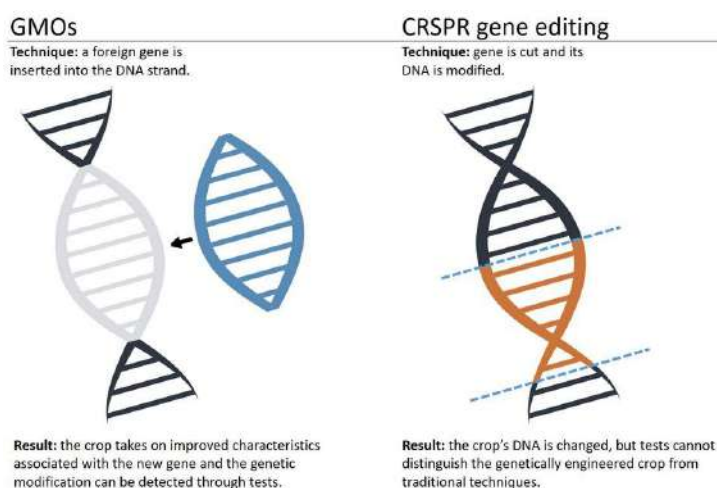
How does it work?

- Zeolite performs the chemistry of separating oxygen from nitrogen in air.
- Being highly porous, zeolite beads have a surface area of about 500 square meters per gram.
- At high pressures in the column, nitrogen is in a tight embrace, chemically speaking, with the zeolite.
- Interaction between the negatively charged zeolite and the asymmetric nucleus (quadrupole moment) of nitrogen causes it to be preferentially adsorbed on the surface of the zeolite.
- Oxygen remains free, and is thus enriched.
- Once nitrogen is captured, what flows out from the column is 90%-plus oxygen.
- After this, lowering the pressure in the column releases the nitrogen, which is flushed out, and the cycle is repeated with fresh air.

4. What are Non-Transgenic Gene Editing techniques?

Why in News?

- The Centre is yet to decide on a research proposal from scientists which would allow plants to be genetically modified without the need for conventional transgenic technology.



What is Genome Editing?

- Genome editing (also called gene editing) is a group of technologies that give scientists the ability to change an organism's DNA.
- These technologies allow genetic material to be added, removed, or altered at particular locations in the genome.
- Several approaches to genome editing have been developed.

Techs for Genome Editing:

- The core technologies now most commonly used to facilitate genome editing are
- Clustered regularly interspaced short palindromic repeats (CRISPR)- associated protein 9 (Cas9)
- Transcription activator-like effector nucleases (TALENs)
- Zinc-finger nucleases (ZFNs)
- Homing endonucleases or meganucleases

Newer Technologies:

- The Institute has now moved to newer technologies such as Site-Directed Nuclease (SDN) 1 and 2.
- They aim to bring precision and efficiency into the breeding process using gene-editing tools such as CRISPR, whose developers won the Nobel Prize for Chemistry in 2020.

CRISPR:

- CRISPR-Cas9 was adapted from a naturally occurring genome editing system in bacteria.
- The bacteria capture snippets of DNA from invading viruses and use them to create DNA segments known as CRISPR arrays.
- The CRISPR arrays allow the bacteria to “remember” the viruses (or closely related ones).
- If the viruses attack again, the bacteria produce RNA segments from the CRISPR arrays to target the viruses' DNA.
- The bacteria then use Cas9 or a similar enzyme to cut the virus DNA apart, which disables the virus. This method is faster, cheaper, more accurate, and more efficient than other existing genome editing methods.

What is Non-Transgenic Gene Editing?

- Unlike the older GM technology which involves the introduction of foreign DNA, the new proposal involves the use of gene editing tools to directly tweak the plant's own genes instead.

- It does not involve inserting any foreign DNA.

Use in India:

- Scientists at the Indian Agricultural Research Institute (IARI) are in the process of developing resilient and high-yield rice varieties using such gene editing techniques.
- However, this proposal has been pending with the Genetic Engineering Appraisal Committee (GEAC) for almost two years.

Why needs such technique?

- **Similar to Natural Mutation:** But in this case, this protein is right there in the plant, and is being changed a little bit, just as nature does through mutation.
- **Faster and Cheaper:** It is much faster and far more precise than natural mutation or conventional breeding methods which involve trial and error and multiple breeding cycles.
- **Safe for consumption:** When a protein comes from an outside organism, then you need to test for safety.
- **Pathbreaking:** It is potentially a new Green Revolution.

No Approval Issues:

- The SDN 1 and SDN 2 categories of genome-edited plants do not contain any foreign DNA when they are taken to the open field trials.
- The US, Canada, Australia and Japan are among the countries which have already approved the SDN 1 and 2 technologies as not akin to GM.
- So, such varieties of rice can be exported without any problem.
- The European Food Safety Authority has also submitted its opinion that these technologies do not need the same level of safety assessment as conventional GM.

5. Hybrid Immunity

Why in News?

- A study has shown that a combination of natural infection with a single dose of vaccine provides Greater Immunity than either natural infection without vaccination or full vaccination in Individuals.

What is the New Study?

- People without prior infection but fully vaccinated with the Pfizer or AstraZeneca vaccine showed a decline in neutralising antibodies over a period of three to seven months.
- But the decline was much less in vaccinated people with prior infection.

- People with hybrid immunity had a higher and more durable neutralising antibody response.
- The hybrid immunity offers stronger protection than just infection or full vaccination alone.

What is Hybrid Immunity?

- It is natural immunity from an infection combined with the immunity provided by the vaccine.
- The immunological advantage from hybrid immunity arises mostly from memory B cells.

What are Memory B cells?

- In immunology, a memory B cell (MBC) is a type of B lymphocyte that forms part of the adaptive immune system.
- B lymphocytes are the cells of the immune system that make antibodies to invade pathogens like viruses.
- They form memory cells that remember the same pathogen for faster antibody production in future infections.

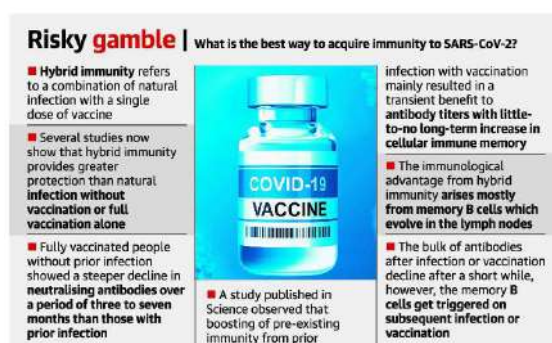
How do they Assist Hybrid Immunity?

- While the bulk of antibodies after infection or vaccination decline after a short while, the memory B cells get triggered on subsequent infection or vaccination.
- The memory B cells triggered by infection and those triggered by vaccination have different responses to viruses.
- Infection and vaccination expose the spike protein to the immune system in vastly different ways.
- After full vaccination, antibodies produced by natural infection continued to grow in potency and their breadth against variants for a year after infection.
- Unlike after vaccination, the memory B cells formed after natural infection are more likely to make antibodies that block immune-evading variants.

6. CERT-In authorized as CVE Numbering Authority (CNA)

Why in News?

- CERT-In has partnered with the Common Vulnerabilities and Exposures (CVE) Program and has been authorized as a CVE Numbering Authority (CNA) for vulnerabilities impacting all products designed, developed and manufactured in India.



Risky gamble | What is the best way to acquire immunity to SARS-CoV-2?

- Hybrid immunity refers to a combination of natural infection with a single dose of vaccine
- Several studies now show that hybrid immunity provides greater protection than natural infection without vaccination or full vaccination alone
- Fully vaccinated people without prior infection showed a steeper decline in neutralising antibodies over a period of three to seven months than those with prior infection
- A study published in Science observed that boosting of pre-existing immunity from prior infection with vaccination mainly resulted in a transient benefit to antibody titers with little to no long-term increase in cellular immune memory
- The immunological advantage from hybrid immunity arises mostly from memory B cells which evolve in the lymph nodes
- The bulk of antibodies after infection or vaccination decline after a short while, however, the memory B cells get triggered on subsequent infection or vaccination

What is CVE Program?

- CVE is an international, community-based effort and relies on the community to discover vulnerabilities.
- The vulnerabilities are discovered then assigned and published to the CVE List.
- Information technology and cybersecurity professionals use CVE Records to ensure they are discussing the same issue, and to coordinate their efforts to prioritize and address the vulnerabilities.
- Partners publish CVE Records to communicate consistent descriptions of vulnerabilities.

Mission of the Program:

- The mission of the CVE Program is to identify, define, and catalog publicly disclosed cybersecurity vulnerabilities.
- The vulnerabilities are discovered then assigned and published by organizations from around the world that have partnered with the CVE Program.

Who are the CNAs?

- CNAs are organizations responsible for the regular assignment of CVE IDs to vulnerabilities, and for creating and publishing information about the Vulnerability in the associated CVE Record.
- The CVE List is built by CVE Numbering Authorities (CNAs).
- Every CVE Record added to the list is assigned by a CNA.
- The CVE Records published in the catalog enable program stakeholders to rapidly discover and correlate vulnerability information used to protect systems against attacks.
- Each CNA has a specific Scope of responsibility for vulnerability identification and publishing.

Indian Computer Emergency Response Team (CERT-IN):

- CERT-IN is an office within the Ministry of Electronics and Information Technology.
- It is the nodal agency to deal with cyber security threats like hacking and phishing. It strengthens the security-related defense of the Indian Internet domain.
- It was formed in 2004 by the Government of India under the Information Technology Act, 2000 Section (70B) under the Ministry of Communications and Information Technology.

4. ECONOMY

1. The many benefits of a strong GI ecosystem

Why in News?

- This editorial discusses various economic and socio-cultural benefits offered by the Geographical Indication (GI) Tagging.

What is Geographical Indication?

- A GI is a sign used on products that have a specific geographical origin and possess qualities or a reputation that are due to that origin.
- India, as a member of the World Trade Organization (WTO), enacted the Geographical Indications of Goods (Registration and Protection) Act, 1999 w.e.f. September 2003.
- GIs have been defined under Article 22 (1) of the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement.
- GI is granted for a term of 10 years in India. As of today, more than 300 GI tags has been allocated so far in India (*Wikipedia).

Why must we promote GI?

- Several studies show that the patents and copyright protection of products under GIs result in higher economic gains, fostering quality production and better distribution of profits.
- **Lost in History:** Most GI are either assigned to the dusty pages of history books or left to rural artisans to propagate and preserve.
- **Source of Income:** Today, with the emphasis on climate change and sustainability, these products can be ready revenue generators.
- **Demand in e-com market:** A modern distribution system exists in India's robust global e-commerce backbone which will propel the nascent GI industry onto the national and world stage.

Need for Govt Support:

- GI products need the support of governments.
- The Europeans are masters at it, as seen by products such as Brie cheese and sparkling wine from Champagne. The EU has an \$87 billion GI economy.
- China has also done very well by GI, strengthening e-commerce in rural areas and actively promoting agricultural special product brands in lesser developed areas.

Role of GI in China's rise:

- A 2017 UNCTAD report on inclusive growth and e-commerce deems China's e-commerce-driven growth as inclusive.
- That means China has successfully empowered micro, small and medium enterprises (MSMEs) to compete with large companies on the same stage, with no geographic boundaries.
- Likewise, despite a globally depressed market for wines, the produce from the Ningxia region of China saw exports surge 46.4 per cent in 2020, benefitting 211 wineries in Ningxia. The output value of GI producers in China totalled \$92.771 billion as of 2020.
- Socio-cultural benefits offered by GI
- GI protection has wider positive benefits, especially for local communities.
- In particular, it encourages the preservation of biodiversity, local know-how and natural resources. And this is where India can do well.
- Multiple benefits flows from a strong GI ecosystem, which can be a wellspring of economic and soft power.
- It will automatically resolve the three fraught India issues of poor pay for talent, low female participation in the labour force, and urban migration.

How can GI induce economic transformation?

1. Promotes Entrepreneurship and 'Passion Economy'
 - ✓ It will convert talent into entrepreneurship with gig workers, and create a "passion" economy, that is, a new way for individuals to monetise their skills and scale their businesses exponentially.
 - ✓ It removes the hurdles associated with freelance work to earn a regular income from a source other than an employer.
2. Employment generation
 - ✓ The labour-intensive nature of GI offers the best solution to boosting the employment-to-population ratio in India. India presently has an abysmal 43 per cent compared with the 55 per cent global average.
3. Women Empowerment
 - ✓ GI production mostly involves artisanal work-from-home culture.
 - ✓ Monetising this artisanal work done at home will increase India's low female labour force participation rate, which at 21 per cent in 2019 was half the 47 per cent Global Average.

4. Prevents migration
 - ✓ The hyper-localised nature of GI offers solutions to reverse urban migration and conserve India's ancient crafts, culture and food.
5. MSME Promotion
 - ✓ A rejuvenation of MSMEs, which account for 31 per cent of India's GDP and 45 per cent of exports, will follow.
 - ✓ An estimated 55.80 million MSMEs employ close to 130 million people; of this, 14 per cent are women-led enterprises and 59.5 per cent are rural.
6. GI Tourism
 - ✓ Another revenue-earner, GI tourism, is typically a by-product of a strong GI ecosystem.
 - ✓ Hurdles in GIs progress
7. Credit Facilities and Capacity Building
 - ✓ Since GI businesses are micro, it is necessary to address the challenges of capacity-building, formal or easy access to credit.
 - ✓ There is a need for forming marketing linkages, research and development, product innovation and competitiveness in both domestic and international markets.
8. Issue of Intermediaries
 - ✓ With the shift to digital platforms, the distribution margins of these gate keepers or mandi agents must be competitive.
 - ✓ They often act as countervailing agents by getting into similar businesses or product lines which will erode GI producer incomes.
9. Ensuring smoother transition
 - ✓ As seen from the experience of the new farm laws, this will be a task for the central and state governments; they must ensure the transition without breaking down too many Existing Linkages.

2. Palk Bay Scheme

Why in News?

- The Union Government is considering increasing the unit cost of deep-sea fishing vessels under the Palk Bay scheme to make it more attractive to fisherfolk.

Palk Bay Scheme:

- The Palk Bay Scheme is the official scheme for diversification of trawl fishing boats from Palk Strait into deep sea fishing boats.



- It is aimed at encouraging fishermen to take up deep-sea fishing and put an end to disputes arising between the India and Sri Lanka.
- The project helps fishermen in the Palk Straits, who are not exposed to deep-sea fishing, to venture deep into the Indian Ocean, Arabian sea and other deep-sea areas to look for fish like tuna that are in high demand.

Why need such Scheme?

- Bottom trawling, an ecologically destructive practice, involves trawlers dragging weighted nets along the sea-floor, causing great depletion of aquatic resources.

Key Components of the Scheme:

- The project aims to replace all trawler boats and introduce over 2,000 deep sea fishing boats in a course of five years.
- The scheme, under the aegis of Blue Revolution scheme – is funded by the Centre – 50 per cent and state government – 20 per cent for a boat costing Rs 80 lakh.
- Of the balance 30 per cent, 10 per cent is contributed by the beneficiary (fisherman), and the remaining 20 per cent is funded by banks.

3. RBI's Monetary Policy Statement

Why in News?

- The Monetary Policy Committee of the RBI kept the benchmark policy rates unchanged, and retained the accommodative stance in its October review.

Factors Playing part in Monetary Policy Decisions:

- It's important to remember that monetary policy these days is influenced by both local macroeconomic developments and the global monetary policy direction, with the former playing a dominant role.
- Locally, after the second wave of the pandemic, a variety of indicators such as the Purchasing Managers Index (manufacturing and services), mobility indicators, government tax collections, exports and imports are pointing at an improvement in economic activity.
- Then there is the good news on the monsoon front. With a late pick-up in rains, the cumulative deficiency in this monsoon season has come down to just 1 per cent of the long-period average (LPA).
- Since the MPC's August 2021 policy review, Covid-19 cases have trended down and there has been admirable progress on the vaccination front.

- Also, despite high year-on-year growth numbers, the level of economic activity this fiscal will only be 1.5 per cent above 2019-2020.

Trends Emerging from the Economic Recovery:

- Role of government: Capital expenditure of both the Centre and states is on track to meet the budgetary commitment, supported by healthy tax collections.
- Large companies on recovery path: Large companies in industrial sectors such as steel, cement, non-ferrous metals are operating at healthy utilisation levels, and have deleveraged their balance sheets.
- Policy support for smaller companies: The going is not so good for the smaller ones.
- Clearly, smaller companies need policy support. The extension of the Emergency Credit Line Guarantee Scheme is a recognition of that.

Private consumption is not Broad-Based Either.

- Even in goods consumption, which is faring better than services, the nature of demand seems skewed towards relatively higher-value items such as cars and utility vehicles.
- This probably reflects the income dichotomy spawned by the pandemic.
- Inflation: Its fall to 5.3 per cent in August offers only limited comfort for two reasons.
- One, core and fuel inflation, which have 54 per cent weightage in CPI, remain stubbornly high. Second, food prices have nudged down overall inflation.
- Domestic growth-inflation dynamics suggest that the RBI has little option but to remain more tolerant of persistent price pressures, and hope that these will eventually prove transitory because they have been primarily driven by supply shocks caused by the pandemic.

Global Monetary Policy Environment:

- Globally, the monetary policy environment is veering towards normalisation/tapering/interest-rate rise largely due to an upward surprise in inflation, or because some central banks feel the objectives of quantitative easing have been met.
- Central banks in advanced economies such as Norway, Korea and New Zealand have recently raised rates.
- The two systemically important central banks — the US Federal Reserve (Fed) and the European Central Bank (ECB) — view the current spike in inflation as fleeting and have communicated greater tolerance for it for a longer period.

4. Customs Duty Waiver on Edible Oil Imports

Why in News?

- The Union Commerce Minister has announced that the government has decided to waive customs duty on import of crude sunflower, palm and soyabean oil, a move aimed at controlling their prices.

Edible Oil Imports and India:

- Given the heavy dependency on imports, the Indian edible oil market is influenced by the international markets.
- Of the 20-21 million tonnes of edible oil that India consumes annually, around 4-15 mt is imported.
- India is second only to China (34-35 mt) in terms of consumption of edible oil.
- Crude and food-grade refined oil is imported in large vessels, mainly from Malaysia, Brazil, Argentina, Indonesia etc.
- Home-grown oilseeds such as soyabean, groundnut, mustard, cottonseed etc find their way to domestic solvent and expellers plants, where both the oil and the protein-rich component is extracted.

Prices and politics:

- Prices of edible oil have been rising across the country since few months.
- Most edible oils are trading between Rs 130-Rs 190/litre.
- Also, the festive season will see increased buying of edible oils.

Impact of the Move:

- Consumers might not see a drastic reduction immediately in prices of edible oil.
- The reduction in duty is expected to affect the earnings of oilseed growers across the country.

Long-term Implications:

- Over the last few years, the government has taken a series of steps to remove India's import dependency on pulses, and tried to do the same for oilseeds through national missions.
- However, frequent market interventions that ultimately bring down prices would backfire on the government and veer farmers away from growing oilseeds.
- We need continuity in prices to help farmers stick to oilseeds or pulses.

Customs Duty:

- Customs duty refers to the tax imposed on goods when they are transported across international borders.
- In simple terms, it is the tax that is levied on import and export of goods.
- Custom duty in India is defined under the Customs Act, 1962, and all matters related to it fall under the Central Board of Excise & Customs (CBEC).
- The government uses this duty to raise its revenues, safeguard domestic industries, and regulate movement of goods. The rate of Customs duty varies depending on where the goods were made and what they were made of.

5. Powering the Energy Sector

Why in News?

- Most discoms are deep into the red as high aggregate technical and commercial (AT&C) losses are chipping into their revenues. Against this backdrop, the Electricity (Amendment) Bill of 2020 is a game-changing reform.

Why the Electricity (Amendment) Bill of 2020 is a game-changing reform:

- De-licensing power distribution: This will provide the consumers with an option of choosing the service provider, switch their power supplier and enable the entry of private companies in distribution, thereby resulting in increased competition.
- In fact, privatisation of discoms in Delhi has reduced AT&C losses significantly from 55% in 2002 to 9% in 2020.
- Open access for purchasing power: Open access for purchasing power from the open market should be implemented across States and barriers in the form of cross-subsidy surcharge, additional surcharge and electricity duty being applied by States should be reviewed.
- Issue of tariff revision: The question of tariffs needs to be revisited if the power sector is to be strengthened.
- Tariffs ought to be reflective of the average cost of supply to begin with and eventually move to customer category-wise cost of supply in a defined time frame.

This will facilitate a reduction in cross-subsidies.

- Inclusion in GST: Electrical energy should be covered under GST, with a lower rate of GST, as this will make it possible for power generator/transmission/distribution utilities to get a refund of input credit, which in turn will reduce the cost of power.

- Use of smart meters: Technology solutions such as installation of smart meters and smart grids which will reduce AT&C losses and restore financial viability of the sector.
- The impetus to renewable energy: The impetus to renewable energy, which will help us mitigate the impact of climate change, is much needed.
- Despite its inherent benefits, the segment has shown relatively slow progress with an estimated installed capacity of 5-6 GW as on date, well short of the 2022 target.
- The Bill also underpins the importance of green energy by proposing a penalty for non-compliance with the renewable energy purchase obligations which mandate States and power distribution companies to purchase a specified quantity of electricity from renewable and hydro sources
- Strengthening the regulatory architecture: This will be done by appointing a member with a legal background in every electricity regulatory commission and strengthening the Appellate Tribunal for Electricity.
- This will ensure faster resolution of long-pending issues and reduce legal hassles.
- Authority for contractual obligation: Provision in the Bill such as the creation of an Electricity Contract Enforcement Authority to supervise the fulfillment of contractual obligations under power purchase agreement, cost reflective tariffs and provision of subsidy through DBT are commendable.
- Early passage of the Bill is critical as it will help unleash a path-breaking reform for bringing efficiency and profitability to the distribution sector.

6. Gross NPAs of Banks to Rise

Why in News?

- Gross Non-Performing Assets (NPAs) of banks are expected to rise to 8-9% this fiscal from 7.5% as on March 31, 2021 but they would still remain below the peak of 11.2% seen at the end of fiscal 2018.

What are Non-Performing Assets?

- For a bank, the loans given by the bank is considered as its assets.
- Any asset which stops giving returns to its investors for a specified period of time is known as Non-Performing Asset (NPA).
- So, if the principle or the interest or both the components of a loan is not being serviced to the lender (bank), then it would be considered as NPA.

Classification of NPAs in India:

- According to the RBI, a NPA is a loan or advance for which the principal or interest payment remained overdue for a period of 90 days.
- Banks are required to classify NPAs further into Substandard, Doubtful and Loss assets.
- Substandard Assets: Assets which has remained NPA for a period less than or equal to 12 months.
- Doubtful Assets: An asset would be classified as doubtful if it has remained in the substandard category for a period of 12 months.
- Loss Assets: As per RBI, loss asset is considered uncollectible and of such little value that its continuance as a bankable asset is not warranted, although there may be some salvage or recovery value.

NPAs of Agriculture Loans:

- In terms of Agriculture/Farm Loans, the NPA is defined as under:
- For short duration crop such as paddy, Jowar, Bajra etc. if the loan (instalment/interest) is not paid for 2 crop seasons, it would be termed as an NPA.
- For Long Duration Crops, the above would be 1 Crop season from the due date

Impact of NPA on Economy:

- Depositors' loss: Depositors do not get rightful returns and many times may lose uninsured deposits.
- High interest on lending: Banks may begin charging higher interest rates on some products to compensate NPA loan losses.
- Trust issues: Bad loans imply redirecting of funds from good projects to bad ones. Hence, the economy suffers due to loss of good projects and failure of bad investments

- Steps taken to curb NPA

(A) By the Govt:

- ✓ Mission Indradhanush: to make the working of public sector bank more transparent and professional in order to curb the menace of NPA in future.
- ✓ Insolvency and Bankruptcy Code: To make it easier for banks to recover the loans from the debtors.
- ✓ Stringent NPA recovery rules: The Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act or SARFESI Act of 2002 was amended in 2016.

(B) By RBI:

- ✓ RBI introduced number of measures in last few years which include:
- ✓ Corporate Debt Restructuring (CDR) mechanism,
- ✓ Setting up a Joint Lenders' Forum, providing banks to disclose the real picture of bad loans, asking them to increase provisioning for stressed assets,
- ✓ Other terms related to NPAs

Write-off effect:

- A loan write-off is a tool used by banks to clean up their balance-sheets.
- If a loan turns bad on the account of the repayment defaults for at least three consecutive quarters, the exposure (loan) can be written off.
- A loan write-off sets free the money parked by the banks for the provisioning of any loan.

Twin Balance Sheet:

- It deals with two balance sheet problems. One with Indian companies and the other with Indian Banks.
- Debt accumulation on companies is very high and thus they are unable to pay interest payments on loans.
- Four Balance Sheet Challenge:
- In his paper named 'India's Great Slowdown', Arvind Subramanian (former Chief Economic Advisor) mentions the new 'Four balance sheet challenge'.
- It includes the original two sectors – infrastructure companies and banks, plus NBFCs and real estate companies.

7. A Global Player in Solar Power

Why in News?

- Large-scale solar projects in Tamil Nadu have seen rapid growth in recent years. By embracing advances in solar technologies, India can continue to lead in this sector.

Factors Driving Growth:

- In the past five years, the cumulative installed capacity witnessed a four-fold increase in Tamil Nadu to 4.4 GW, as of March 2021.
- **High Insolation Level:** Aiding this capacity addition is the State's reasonably high insolation levels and matching solar potential, estimated at 279GW.
- **Decline in Price:** The sharp decline in the prices for solar and resulting cost competitiveness is another factor.

- **National Target:** Additionally, in response to the ambitious national targets and to spur sector specific development, Tamil Nadu released the Solar Policy of 2019, aiming for 9GW of solar installations by 2023.

Type of Technology use for Solar Panel:

- Mono-crystalline Vs multi-crystalline panels:
 - ✓ 'First-generation' solar cells use mono-crystalline and multi-crystalline silicon wafers.
 - ✓ The efficiency of mono-crystalline panels is about 24%, while for multi-crystalline panels it is about 20%.
 - ✓ Mono-crystalline cells are dominant today.
 - ✓ Although mono-crystalline panels are priced higher than multi-crystalline ones, the difference is diminishing and will soon attain parity.
 - ✓ This would result in mono panels being preferred over multi due to their higher efficiency, greater energy yield and lower cost of energy.
- Bifacial solar cells:
 - ✓ Newer technologies incorporating crystalline silicon focus on bifacial solar cells, capable of harvesting energy from both sides of the panel.
 - ✓ Bifacials can augment the power output by 10-20%.
 - ✓ Within this, the Passive Emitter and Rear Contact technology is predicted to gain popularity. However, it is yet to achieve price parity for large-scale deployment.
- Thin-film technologies:
 - ✓ It is classified as the 'second generation of solar PVs.'
 - ✓ In addition to being used in solar farms and rooftops, thin films with their low thickness, light weight and flexibility are also placed on electronic devices and vehicles, power streetlights and traffic signals.
 - ✓ Mainstream thin films utilise semiconductor chemistries like Cadmium Telluride with module efficiencies of around 19%.
 - ✓ Other technologies include Amorphous Silicon and Copper Indium Gallium Di-Selenide. Nanocrystal and dye-sensitised solar cells are variants of the thin film technology. These are in early stages for large-scale commercial deployment
 - ✓ However, the efficiency of thin films is lower than that of crystalline silicon.
- Perovskite:
 - ✓ These are grouped as 'third generation' and contain technologies such as perovskite, nanocrystal and dye-sensitised solar cells.

- ✓ Perovskites have seen rapid advances in recent years, achieving cell efficiency of 18%.
- ✓ They have the highest potential to replace silicon and disrupt the solar PV market, due to factors such as ease of manufacture, low production costs and potential for higher efficiencies.
- Use of Graphene Quantum-dots:
 - ✓ Graphene is made of a single layer of carbon atoms bonded together as hexagons.
 - ✓ Solar cells made of graphene are of interest due to high theoretical efficiency of 60% and its super capacitating nature.
 - ✓ Quantum-dot PVs use semiconductor nanocrystals exhibiting quantum mechanical properties capable of high efficiency of about 66%.
 - ✓ However, both these are in the early stages of research.
 - ✓ Technologies to better integrate solar PVs into the grid
 - ✓ These technologies include weather forecasting and power output prediction systems; operation monitoring and control systems; and scheduling and optimisation systems.
 - ✓ Additionally, automatic systems have been developed for the smooth resolution of output fluctuations.

Way Forward:

- A portion of the budget for renewable energy targets should be set aside exclusively for new technologies.
- Grants and subsidies can also be provided for their adoption.
- Efforts must be taken to address gaps in research, development, and manufacturing capabilities in the solar sector through sector-specific investment and incentives.
- There must also be greater industry-academia collaborations and funding opportunities for startups.
- A comprehensive sector-specific skilling programme is also required for workers.

8. India's First Banni Buffalo IVF Calf Born

Why in News?

- With the birth of first IVF calf of a Buffalo breed namely Banni in the country, India's Ovum Pick-Up (OPU) – IVF work has reached to next level.

Banni Buffalo:

- Banni buffaloes are also known as “Kutchi” or “Kundi”.
- The breeding tract includes the Banni area of Kutch district of Gujarat.

- The breed is maintained mostly by Maldharis under locally adapted typical extensive production system in its breeding tract.
- What makes them unique?
- Banni buffaloes are trained to graze on Banni grassland during night and brought to the villages in the morning for milking.
- This traditional system of buffalo rearing has been adapted to avoid the heat stress and high temperature of the day.
- It has unique qualities of adaptation such as the ability to survive water scarcity conditions, to cover long distances during periods of drought and disease resistance.

Indigenous buffalo breeds in India:

S. No	BREED	BREEDING STATE
1	Banni	Gujarat
2	Bargur	Tamil Nadu
3	Bhadawari	Uttar Pradesh and Madhya Pradesh
4	Chattisgarh	Chhattisgarh
5	Chilika	Odisha
6	Gojri	Himachal Pradesh and Punjab
7	Jaffarabadi	Gujarat
8	Kalahandi	Odisha
9	Luit (Swamp)	Assam
10	Marathwadi	Maharashtra
11	Mehsana	Gujarat
12	Murrah	Haryana and Delhi
13	Nagpuri	Maharashtra
14	Nilli Ravi	Punjab
15	Pandharpuri	Maharashtra
16	Surti	Gujarat
17	Toda	Tamil Nadu

9. A clean energy transition plan for India

Why in News?

- India has a long way to go in providing electricity security to its people since its per capita electricity consumption is still only a third of the global average.

Ensuring energy security and role of coal:

- Energy security warrants the uninterrupted supply of energy at affordable prices.
- Thanks to the Electricity Act of 2003, the installed coal-fired thermal power plant (TPP) generation capacity in India more than doubled from 94 GW to 192 GW between March 2011 and 2017.
- This sharp increase in the installed capacity has enabled the government to increase per capita electricity consumption by 37% while reducing peak demand deficit from 9.8% (2010-11) to 1.6% (2016-17).
- TPPs contributed 71% of the 1,382 billion units (BU) of electricity generated by utilities in India during FY 2020-21 though they accounted for only 55% of the total installed generation capacity of 382 GW (as of March 2021).
- Coal, therefore, plays a vital role in India's ongoing efforts to achieve Sustainable Development Goal 7, which is "to ensure access to affordable, reliable, sustainable and modern energy for all".
- Renewable energy utilisation issue and implications for consumers:
- While variable renewable energy (VRE) sources (primarily, wind and solar) account for 24.7% of the total installed generation capacity, as of March 2021, they contributed 10.7% of the electricity generated by utilities during FY 2020-21.
- However, the ramp-up of VRE generation capacity without commensurate growth in electricity demand has resulted in lower utilisation of TPPs whose fixed costs must be paid by the distribution companies (DISCOMs) and passed through to the final consumer.
- The current level of VRE in the national power grid is increasing the cost of power procurement for DISCOMs, leading to tariff increases for electricity consumers.
- Therefore, India must implement a plan to increase energy efficiency and reduce the emissions of carbon dioxide (CO₂) and airborne pollutants from TPPs without making power unaffordable to industries that need low-cost 24×7 power to compete in the global market.

Way forward: time-bound Transition Plan:

- Phasing out: The plan should involve the progressive retirement of TPPs (unit size 210 MW and below) based on key performance parameters such as efficiency, specific coal consumption, technological obsolescence, and age.

- Increasing utilisation: The resulting shortfall in baseload electricity generation can be made up by increasing the utilisation of existing High-Efficiency-Low-Emission (HELE) TPPs that are currently under-utilised to accommodate VRE and commissioning the 47 government-owned TPPs.
- In addition, the Nuclear Power Corporation of India Limited (NPCIL) is also constructing 11 nuclear power plants with a total generation capacity of 8,700 MW that will supply 24×7 power without any CO₂ emissions.
- The combined thermal (220 GW) and nuclear (15 GW) capacity of 235 GW can meet the baseload requirement (80% of peak demand) during the evening peak in FY 2029-30 without expensive battery storage.
- The optimal utilisation of existing and under-construction HELE TPPs with faster-ramping capabilities and lower technical minimums also facilitates VRE integration.
- Since HELE TPPs minimise emissions of particulate matter (PM), SO₂, and NO₂, the transition plan offers operational, economic, and environmental benefits including avoidance of sustenance Capex and FGD costs in the 211 obsolete TPPs to be retired besides savings in specific coal consumption and water requirement leading to reductions in electricity tariffs and PM pollution.

10. Gov Floating Rate Bonds

Why in News?

- The Government of India has announced the Sale (Re-issue) of Floating Rate Bonds, 2028’.

What are Bonds?

- Bonds are investment securities where an investor lends money to a company or a government for a set period of time, in exchange for regular interest payments.
- Generally, bonds come with a fixed coupon or interest rate. For example, you can buy a bond of Rs 10,000 with a coupon rate of 5%.
- Once the bond reaches maturity, the bond issuer returns the investor’s money.
- Fixed income is a term often used to describe bonds, since your investment earns fixed payments over the life of the bond.

Why are Bonds Launched?

- Companies sell bonds to finance ongoing operations, new projects or acquisitions.
- Governments sell bonds for funding purposes, and also to supplement revenue from taxes.

- What are Floating Rate Bonds?
- A floating rate bond is a debt instrument that does not have a fixed coupon rate, but its interest rate fluctuates based on the benchmark the bond is drawn.
- Benchmarks are market instruments that influence the overall economy.
- For example, repo rate or reverse repo rate can be set as benchmarks for a floating rate bond.

How do Floating Rate bonds work?

- Floating rate bonds make up a significant part of the Indian bond market and are majorly issued by the government.
- For example, the RBI issued a floating rate bond in 2020 with interest payable every six months. After six months, the interest rate is re-fixed by the RBI.

11. Prakritik Kheti Khushhal Yojana (PK3Y)

Why in News?

- Women farmers in the hill State of Himachal Pradesh are gradually turning to non-chemical, low cost “natural farming”, under the Prakritik Kheti Khushhal Yojana (PK3Y).

Prakritik Kheti Khushhal Yojana:

- Launched in 2018, the State’s PK3Y is promoting the climate resilient Subhash Palekar Natural Farming (SPNF), also called ‘Zero Budget Natural Farming’.
- Over 1.5 lakh farmers have been trained in natural farming in the State so far, with substantial numbers of women participants.

Zero Budget Natural Farming (ZBNF):

- ZBNF is a set of farming methods, and also a grassroots peasant movement, which has spread to various states in India. Subhash Palekar perfected it during the 1990s at his farm in Amravati district in Maharashtra’s drought-prone Vidarbha region.
- According to the “zero budget” concept, farmers won’t have to spend any money on fertilisers and other agricultural inputs.
- Over 98% of the nutrients that crops require — carbon dioxide, nitrogen, water, solar energy — are already present in nature.
- The remaining 1.5-2% are taken from the soil, after microorganisms convert them from “non-

Four Wheels of ZBNF:

- The “four wheels” of ZBNF are ‘Jiwamrita’, ‘Bijamrita’, ‘Mulching’ and ‘Waaphasa’.

- Jiwamrita is a fermented mixture of cow dung and urine (of desi breeds), jaggery, pulses flour, water and soil from the farm bund.
- This isn't a fertiliser, but just a source of some 500 crore micro-organisms that can convert all the necessary "non-available" nutrients into "available" form.
- Bijamrita is a mix of desi cow dung and urine, water, bund soil and lime that is used as a seed treatment solution prior to sowing.
- Mulching, or covering the plants with a layer of dried straw or fallen leaves, is meant to conserve soil moisture and keep the temperature around the roots at 25-32 degrees Celsius, which allows the microorganisms to do their job.
- Waaphasa, or providing water to maintain the required moisture-air balance, also achieves the same objective.

Astra's of ZBNF against pest attacks:

- ZBNF advocates the use of special 'Agniastra', 'Bramhastra' and 'Neemastra' concoctions.
- They are based on cow urine and dung, plus pulp from leaves of neem, white datura, papaya, guava and pomegranates — for controlling pest and disease attacks.
- Is it organic farming?
- ZBNF uses farmyard manure or vermicompost.
- However, not all farmers are convinced about ZBNF. Why?
- Cost of labour: The cost of labour for collection of dung and urine, apart from the other inputs used in preparation of Jiwamrita, Neemastra or Bramhastra is quit higher.
- Bovine cost: Keeping cows is also a cost that has to be accounted for. Farmers cannot afford to keep desi cows that yield very little milk.
- Vulnerability to pest attacks: ZBNF is scarcely practiced. The crop grown would be vulnerable to attacks by insects and pests have already become pest-immune.

12. Unified Database of Birth and Death

Why in News?

- The Centre has proposed amendments to a 1969 law that will enable it to "maintain the database of registered birth and deaths at the national level".

Registration of Births and Deaths Act (RBD), 1969:

- The registration of births, deaths and stillbirths are compulsory under the provisions of RBD Act in all parts of the Country.

- The normal period of 21 days (from the date of occurrence) has been prescribed for reporting the birth, death and stillbirth events.

Why Need Amendment?

- The database may be used to update the Population Register and the electoral register, and Aadhaar, ration card, passport and driving licence databases after the amendment.
- Presently, the registration of births and deaths is done by the local registrar appointed by States.

What are the Proposed Amendments?

- It is proposed that the Chief Registrar (appointed by the States) would maintain a unified database at the State level.
- It would then integrate it with the data at the “national level,” maintained by the Registrar General of India (RGI).
- The amendments will imply that the Centre will be a parallel repository of data.

Significance of the database:

- It would help update:
- Population Register prepared under the Citizenship Act, 1955;
- Electoral registers or electoral rolls prepared under the Representation of the People Act, 1951.
- Aadhaar database prepared under the Aadhaar Act, 2016;
- Ration card database prepared under the National Food Security Act, 2013;
- Passport database prepared under the Passport Act; and
- Driving licence database under the Motor Vehicles (Amendment) Act, 2019, and
- Other databases at the national level are subject to provisions of Section 17 (1) of the RBD Act, 1969

13. APVAX Initiative

Why in News?

- The Government of India has applied for loans from the Asian Development Bank (ADB) and the Asian Infrastructure Investment Bank (AIIB) to procure as many as 667 million doses of COVID-19 vaccines under the APVAX initiative.

APVAX Initiative:

- The ADB is expected to lend \$1.5 billion and the AIIB around \$500 million for the vaccine purchase by India.

- It which has been made under the ADB's Asia Pacific Vaccine Access Facility (APVAX) initiative.
- Launched in December 2020, APVAX offers “rapid and equitable support to its developing member countries as they procure and deliver effective and safe COVID-19 vaccines”.
- The Beijing-headquartered AIIB will co-finance the Vaccine Procurement.

Asian Development Bank (ADB):

- The ADB is a regional development bank established on 19 December 1966.
- It is headquartered in the Ortigas Center located in the city of Mandaluyong, Metro Manila, Philippines.
- From 31 members at its establishment, ADB now has 68 members.
- The ADB was modelled closely on the World Bank, and has a similar weighted voting system where votes are distributed in proportion with members' capital subscriptions.
- ADB is an official United Nations Observer.
- As of 31 December 2020, Japan and the UN each holds the largest proportion of shares at 15.571%.
- China holds 6.429%, India holds 6.317%, and Australia holds 5.773%.

Asian Infrastructure Investment Bank (AIIB):

- The AIIB is a multilateral development bank that aims to improve economic and social outcomes in Asia.
- The bank was proposed by China in 2013 and the initiative was launched at a ceremony in Beijing in October 2014.
- The bank currently has 103 members, including 16 prospective members from around the world.
- The starting capital of the bank was US\$100 billion, equivalent to 2/3 of the capital of the Asian Development Bank and about half that of the World Bank.
- It received the highest credit ratings from the three biggest rating agencies in the world, and is seen as a potential rival to the World Bank and IMF.

AIIB and India:

- So far, the AIIB has approved loans for 28 projects in India amounting to \$6.7 billion, more than for any other member of the multilateral bank.
- India is the second-largest shareholder after China in the bank, which does not count the U.S. and Japan among its members.

5. GEOGRAPHY & ENVIRONMENT

1. India needs a carbon policy for agriculture

Why in News?

- The UK is set to host the 26th UN Climate Change Conference of the Parties (CoP26) in Glasgow from October 31 to November 12 with a view to accelerate action towards the Paris Agreement's goals. The focus should be on climate finance and transfer of green technologies at low cost.

Cause of Concern for India:

- According to the Global Carbon Atlas, India ranks third in total greenhouse gas emissions by emitting annually around 2.6 billion tonnes (Bt) CO₂eq, preceded by China (10 Bt CO₂eq) and the United States (5.4 Bt CO₂eq), and followed by Russia (1.7Bt) and Japan (1.2 Bt).
- India ranked seventh on the list of countries most affected due to extreme weather events, incurring losses of \$69 billion (in PPP) in 2019 (Germanwatch, 2021).
- The fact that 22 of the 30 most polluted cities in the world are in India is a major cause of concern.
- Delhi is the world's most polluted capital as per the World Air Quality Report, 2020.
- Issues raised in global negotiation on climate change:
- Nations are still quibbling about historical global emitters and who should take the blame and fix it.
- Global negotiations on climate change often talk about emissions on a per capita basis and the emission intensity of GDP.
- Per capita emission: Of the top five absolute emitters, the US has the highest per capita emissions (15.24 tonnes), followed by Russia (11.12 tonnes).
- India's per capita emissions is just 1.8 tonnes, significantly lower than the world average of 4.4 tonnes per capita.
- If one takes emissions per unit of GDP, of the top five absolute emitters, China ranks first with 0.486 kg per 2017 PPP \$ of GDP, which is very close to Russia at 0.411 kg per 2017 PPP \$ of GDP. India is slightly above the world average of 0.26 (kg per 2017 PPP \$ of GDP) at 0.27 kg, while the USA is at 0.25, and Japan at 0.21.
- In our Nationally Determined Contributions (NDCs) submitted in 2016, India committed to "reduce emission intensity of its GDP by 33 to 35 per cent by 2030 from 2005 level."

- Sector-wise emission and share of agriculture in it
- Global emissions show that electricity and heat production and agriculture, forestry and other land use make up 50 per cent of the emissions.
- But the emissions pie in India owes its largest chunk (44 per cent) to the energy sector, followed by the manufacturing and construction sector (18 per cent), and agriculture, forestry and land use sectors (14 per cent), with the remaining being shared by the transport, industrial processes and waste sectors.
- The share of agriculture in total emissions has gradually declined from 28 per cent in 1994 to 14 per cent in 2016.
- However, in absolute terms, emissions from agriculture have increased to about 650 Mt CO₂ in 2018, which is similar to China's emissions from agriculture.
- Agricultural emissions in India are primarily from the livestock sector (54.6 per cent) in the form of methane emissions due to enteric fermentation and the use of nitrogenous fertilisers in agricultural soils (19 per cent) which emit nitrous oxides; rice cultivation (17.5 per cent) in anaerobic conditions accounts for a major portion of agricultural emissions followed by livestock management (6.9 per cent) and burning of crop residues (2.1 per cent).
- Way forward: Carbon policy for agriculture
- Reward farmers through carbon credit: A carbon policy for agriculture must aim not only to reduce its emissions but also reward farmers through carbon credits which should be globally tradable.
- Focus on livestock: With the world's largest livestock population (537 million), India needs better feeding practices with smaller numbers of cattle by raising their productivity.
- Switch areas from rice to maize: While direct-seeded rice and alternative wet and dry practices can reduce the carbon footprint in rice fields, the real solution lies in switching areas from rice to maize or other less water-guzzling crops.
- Efficient fertiliser use: Agricultural soils are the largest single source of nitrous oxide (N₂O) emissions in the national inventory.
- Nitrous oxide emissions from use of nitrogen-fertiliser increased by approximately 358 per cent during 1980-81 to 2014-15.
- An alternative for better and efficient fertiliser use would be to promote fertigation and subsidise soluble fertilisers.

- Incentives and subsidies: The government should incentivise and give subsidies on drips for fertigation, switching away from rice to corn or less water-intensive crops, and promoting soluble fertilisers at the same rate of subsidy as granular urea.

2. COP26 Climate Conference and Why it is important

Why in News?

- The UK will host the COP 26 UN Climate Change Conference from October 31 to November 12.

Conference of Parties (CoP):

- The CoP comes under the United Nations Climate Change Framework Convention (UNFCCC) which was formed in 1994.
- The UNFCCC was established to work towards “stabilisation of greenhouse gas concentrations in the atmosphere.”
- It laid out a list of responsibilities for the member states which included:
 - Formulating measures to mitigate climate change
 - Cooperating in preparing for adaptation to the impact of climate change
 - Promoting education, training and public awareness related to climate change
- The UNFCCC has 198 parties including India, China and the USA. COP members have been meeting every year since 1995.

COP1 to COP25: Key takeaways

- **COP1:** The first conference was held in 1995 in Berlin.
- **COP3:** It was held in Kyoto, Japan, in 1997, the famous Kyoto Protocol (w.e.f. 2005) was adopted. It commits the member states to pursue limitation or reduction of greenhouse gas emissions.
- **COP8:** India hosted the eighth COP in 2002 in New Delhi. It laid out several measures including, ‘strengthening of technology transfer... in all relevant sectors, including energy, transport and R&D, and the strengthening of institutions for sustainable development.
- **COP21:** it is one of the most important that took place in 2015, in Paris, France. Here countries agreed to work together to ‘limit global warming to well below 2, preferably at 1.5 degrees Celsius, compared to pre-industrial levels.’

Significance of COP26:

- The event will see leaders from more than 190 countries, thousands of negotiators, researchers and citizens coming together to strengthen a global response to the threat of climate change.
- It is a pivotal movement for the world to come together and accelerate the climate action plan after the COVID pandemic.

COP26 Goals:

- According to the UNFCCC, COP26 will work towards four goals:
- Secure global net-zero by mid-century and keep 1.5 degrees within reach
- The UNFCCC recommends that countries ‘accelerate the phase-out of coal, curtail deforestation, speed up the switch to electric vehicles and encourage investment in renewables’ to meet this Goal.
- Adapt to protect communities and Natural Habitats
- Countries will work together to ‘protect and restore ecosystems and build defences, warning systems and resilient infrastructure and agriculture to avoid loss of homes, livelihoods and even lives.’

Mobilise finance:

- To deliver on first two goals, developed countries must make good on their promise to mobilise at least \$100bn in climate finance per year by 2020.
- Work together to deliver
- Another important task at the COP26 is to ‘finalise the Paris Rulebook’. Leaders will work together to frame a list of detailed rules that will help fulfil the Paris Agreement.
- What India could do to reach its targets?
- Update NDCs: It is time for India to update its Nationally Determined Contributions or NDCs. (NDCs detail the various efforts taken by each country to reduce the national emissions)
- **Effective Planning:** Sector by sector plans are needed to bring about development. We need to decarbonise the electricity, transport sector and start looking at carbon per passenger mile.
- **Energy Transition:** Aggressively figure out how to transition our coal sector
- Robust legal framework: India also needs to ramp up the legal and institutional framework of climate change.

3. Why India shouldn't sign on to net zero

Why in News?

- The recent report of the Intergovernmental Panel on Climate Change made it clear that limiting the increase in the world's average temperature from pre-industrial levels to those agreed in the Paris Agreement requires global cumulative emissions of carbon dioxide to be capped at the global carbon budget.
- Understanding why reaching net zero by itself is irrelevant to forestalling dangerous warming:
- The promise of when you will turn off the tap does not guarantee that you will draw only a specified quantity of water.
- The top three emitters of the world — China, the U.S. and the European Union — even after taking account of their net zero commitments and their enhanced emission reduction commitments for 2030, will emit more than 500 billion tonnes of carbon dioxide before net zero.
- These three alone will exceed the limit of about 500 billion tonnes from 2020 onwards, for even odds of keeping global temperature increase below 1.5°C.

Issues with 'net zero' Target:

- Neither the Paris Agreement nor climate science requires that net zero be reached individually by countries by 2050, the former requiring only global achievement of this goal “in the second half of the century”.
- Claims that the world “must” reach specific goals by 2030 or 2050 are the product of specific economic models for climate action.
- They front-load emission reduction requirements on developing countries, despite their already low emissions, to allow the developed world to backload its own, buying time for its own transition.
- These stringent limits on future cumulative emissions post 2020, amounting to less than a fifth of the total global carbon budget, is the result of its considerable over-appropriation in the past by the global North.
- Promises of net zero in their current form perpetuate this hugely disproportionate appropriation of a global commons, while continuing to place humanity in harm's way.

Suggestions for India:

- India is responsible for no more than 4.37% cumulative emissions of carbon dioxide since the pre-industrial era, even though it is home to more than a Sixth of Humanity.

- India's per capita emissions are less than half the world average, less than one-eighth of the U.S.'s.
- For India to declare net zero now is to accede to the further over-appropriation of the global carbon budget by a few.
- India's contribution to global emissions, in both stock and flow, is so disproportionately low that any sacrifice on its part can do nothing to save the world.
- India, in enlightened self-interest, must now stake its claim to a fair share of the global carbon budget.
- Technology transfer and financial support, together with "negative emissions", if the latter succeeds, can compensate for the loss of the past.
- Such a claim by India provides it greater, and much-needed long-term options.
- It enables the responsible use of coal, its major fossil fuel resource, and oil and gas, to bootstrap itself out of lower-middle-income economy status and eradicate poverty, hunger and malnutrition for good.
- India's resource-strapped small industries sector needs expansion and modernisation.
- The agriculture sector, the second-largest source of greenhouse gas emissions for India after energy, needs to double its productivity and farmers' incomes and build resilience.
- Infrastructure for climate resilience in general is critical to future adaptation to climate change.
- All of these will require at least the limited fossil fuel resources made available through a fair share of the carbon budget.

6. INTERNATIONAL RELATIONS

1. India, Australia to conclude free trade pact by end 2022

Why in News?

- India and Australia have agreed to conclude a Free Trade Agreement (FTA) by the end of 2022.

What is a Free Trade Agreement (FTA)?

- A FTA is a pact between two or more nations to reduce barriers to imports and exports among them.
- Under a free trade policy, goods and services can be bought and sold across international borders with little or no government tariffs, quotas, subsidies, or prohibitions to inhibit their exchange.
- The concept of free trade is the opposite of trade protectionism or Economic Isolationism.

Key benefits offered by FTA:

- Reduction or elimination of tariffs on qualified: For example, a country that normally charges a tariff of 12% of the value of the incoming product will rationalize or eliminate that tariff.
- Intellectual Property Protection: Protection and enforcement of intellectual property rights in the FTA partner country is upheld.
- Product Standards: FTA enhances the ability for domestic exporters to participate in the development of product standards in the FTA partner country.
- Fair treatment for investors: FTA provides treatment as favourably as the FTA partner country gives equal treatment for investments from the partner country.
- Elimination of monopolies: With FTAs, global monopolies are eliminated due to increased competition.

How many FTAs does India have?

- India has signed its first Free Trade Agreement (FTA) with Sri Lanka in 1998.
- Likewise, India had FTAs with: Nepal, Bhutan, Thailand, Singapore, ASEAN, Japan and Malaysia.
- India has signed Preferential Trade Agreements such as:
- Asia Pacific Trade Agreement (APTA) with Bangladesh, China, India, Lao PDR, Republic of Korea, and Sri Lanka
- Global System of Trade Preferences (GSTP)

- India – MERCOSUR PTA etc. with South American countries

Types of Trade Agreements

- Free Trade Agreement – discussed above
- Preferential Trade Agreement
 - ✓ In this type of agreement, two or more partners give preferential right of entry to certain products.
 - ✓ This is done by reducing duties on an agreed number of tariff lines.
 - ✓ Here a positive list is maintained i.e. the list of the products on which the two partners have agreed to provide preferential access.
 - ✓ Tariff may even be reduced to zero for some products even in a PTA.
 - ✓ India signed a PTA with Afghanistan.
- Comprehensive Economic Partnership Agreement
 - ✓ Partnership agreement or cooperation agreement are more comprehensive than an FTA.
 - ✓ CECA/CEPA also looks into the regulatory aspect of trade and encompasses an agreement covering the regulatory issues.
 - ✓ CECA has the widest coverage. CEPA covers negotiation on the trade in services and investment, and other areas of economic partnership.
 - ✓ It may even consider negotiation on areas such as trade facilitation and customs cooperation, competition, and IPR.
 - ✓ India has signed CEPAs with South Korea and Japan.
- Comprehensive Economic Cooperation Agreement
 - ✓ CECA generally cover negotiation on trade tariff and Tariff rate quotas (TRQs) rates only. It is not as comprehensive as CEPA.
 - ✓ India has signed CECA with Malaysia.
- Framework Agreement
 - ✓ Framework agreement primarily defines the scope and provisions of orientation of the potential agreement between the trading partners.
 - ✓ It provides for some new area of discussions and set the period for future liberalisation.
 - ✓ India has previously signed framework agreements with the ASEAN, Japan etc.
- Early Harvest Scheme
 - ✓ An Early Harvest Scheme (EHS) is a precursor to an FTA/CECA/CEPA between two trading partners. For example, early harvest scheme of RCEP has been rolled out.

- ✓ At this stage, the negotiating countries identify certain products for tariff liberalization pending the conclusion of actual FTA negotiations.
- ✓ An Early Harvest Scheme is thus a step towards enhanced engagement and confidence building.

2. Green Pacts inked at India, Denmark Summit

Why in News?

- India and Denmark signed two agreements on research in climate change, while another MoU on setting up a “green hydrogen” electrolyzer plant.
- This was the first summit-level visit to India since the COVID pandemic and the first State visit by a Danish leader since a bilateral freeze on ties a decade ago.
- This is in continuance to the joint declaration of the “Green Strategic Partnership” that India and Denmark forged after a virtual summit between PMs Modi and Frederiksen in September 2020.

Areas of Cooperation:

- There are agreements to pursue joint cooperation in the field of health technology and agriculture. Joint ventures on food safety, cold chains, food processing, and water management are to be finalized.
- Agreement between the Council of Scientific and Industrial Research and the Geological Survey of Denmark to conduct groundwater mapping.
- MoU between the Indian Institute of Science and Danfoss Industries to set up a research center on carbon-based cooling systems.
- The commercial MoU between Reliance Industries Limited and Stiesdal Fuel Technologies will work on the development of a “Hydrogen Electrolyser” for zero-carbon hydrogen to be manufactured in India.
- There are plans to build four factories for the production of solar PV modules, electrolyzers, fuel cells, and storage batteries in Gujarat.
- The two leaders also discussed the situation in Afghanistan and shared common concerns on terrorism, the rights of women and minorities, and the need for an inclusive Government.

Significance of Green Hydrogen:

- Environmental: Reduction of Carbon Footprint, Achievement of INDC targets, net-zero emissions by 2050, and limit Global Temperature rises to 1.5C.

- **Profitable:** Could supply up to 25% of the world's energy needs by 2050 and become a US\$10 trillion addressable market by 2050.
- Production costs have fallen by 40% since 2015 and are expected to fall by a further 40% through 2025.
- Potential demand for imported hydrogen in China, Japan, South Korea, and Singapore could reach \$9.5 billion by 2030.
- Energy Security can be ensured in a sustainable manner.
- Reduce India's dependency on crude oil, helping stabilize the Current Account Deficit.
- Other Measures taken by India:
- National Hydrogen Energy Mission was formally announced in the Union budget for 2020-21.
- India also plans to extend the production-linked incentive (PLI) scheme for manufacturing electrolyzers, which are used for producing green hydrogen.
- India is scheduled to host a two-day summit on green hydrogen, with countries like Brazil, Russia, China, and South Africa set to take part in it.

3. Global Minimum Tax Deal

Why in News?

- A global deal to ensure big companies pay a minimum tax rate of 15% and make it harder for them to avoid taxation has been agreed by 136 countries.

What is the News?

- The OECD said four countries – Kenya, Nigeria, Pakistan and Sri Lanka – had not yet joined the agreement.
- However, the countries behind the accord together accounted for over 90% of the global economy.

Why a Global Minimum Tax?

- With budgets strained after the COVID-19 crisis, many governments want more than ever to discourage multinationals from shifting profits – and tax revenues – to low-tax countries.
- Increasingly, income from intangible sources such as drug patents, software and royalties on intellectual property has migrated to these jurisdictions.
- This has allowed companies to avoid paying higher taxes in their traditional home countries.

- The minimum tax and other provisions aim to put an end to decades of tax competition between governments to attract foreign investment.

How would a Deal Work?

- The global minimum tax rate would apply to overseas profits of multinational firms with 750 million euros (\$868 million) in sales globally.
- Govts could still set whatever local corporate tax rate they want.
- However, buif companies pay lower rates in a particular country, their home governments could “top up” their taxes to the 15% minimum, eliminating the advantage of shifting profits.
- A second track of the overhaul would allow countries where revenues are earned to tax 25% of the largest multinationals’ so-called excess profit – defined as profit in excess of 10% of revenue.

What Happens Next?

- The next step is for finance ministers from the Group of 20 economic powers to formally endorse the deal, paving the way for adoption by G20 leaders at an end October summit.
- Nonetheless, questions remain about the US position which hangs in part on a domestic tax reform the Biden administration wants to push through the US Congress.
- The agreement calls for countries to bring it into law in 2022 so that it can take effect by 2023, an extremely tight timeframe given that previous international tax deals took years to implement.
- Countries that have in recent years created national digital services taxes will have to Repeal Them.

What will be the Economic Impact?

- The OECD, which has steered the negotiations, estimates the minimum tax will generate \$150 billion in additional global tax revenues annually.
- Taxing rights on more than \$125 billion of profit will be additionally shifted to the countries were they are earned from the low tax countries where they are currently booked.
- Economists expect that the deal will encourage multinationals to repatriate capital to their country of headquarters, giving a boost to those economies.
- However, various deductions and exceptions baked into the deal are at the same time designed to limit the impact on low tax countries like Ireland, where many US groups base their European operations.

Base Erosion and Profit Shifting (BEPS):

- BEPS refers to corporate tax planning strategies used by multinationals to “shift” profits from higher-tax jurisdictions to lower-tax jurisdictions.
- It thus “erodes” the “tax base” of the higher-tax jurisdictions.
- Corporate tax havens offer BEPS tools to “shift” profits to the haven, and additional BEPS tools to avoid paying taxes within the haven.
- It is alleged that BEPS is associated mostly with American technology and life science Multinationals.

4. Govt pushes for a reset of India-ASEAN FTA

Why in News?

- The Commerce and Industry Minister has called for a renegotiation of the India-ASEAN free trade agreement (FTA).

Why Such Move?

- The MCI aims to prevent its misuse by ‘third parties’ and remove trade restrictions as well as non-tariff barriers that he said had hurt Indian exports disproportionately since the pact was operationalized in 2010.
- The focus needed to be on new rules to eliminate misuse ‘by third parties outside ASEAN’, the minister said, hinting at China.
- India had to deal with several restrictive barriers on exports in the ASEAN region, particularly in the agriculture and auto sectors.

ASEAN:

- Officially the Association of Southeast Asian Nations, ASEAN is an economic union comprising 10 member states in Southeast Asia.
- It promotes intergovernmental cooperation and facilitates economic, political, security, military, educational, and sociocultural integration between its members and other countries in Asia.
- India-ASEAN Free Trade Agreement:
 - The initial framework agreement for ASEAN–India Free Trade Area (AIFTA) was signed on 8 October 2003 in Bali, Indonesia.
 - The FTA came into effect on 1 January 2010.
 - The FTA had emerged from a mutual interest of both parties to expand their economic ties in the Asia-Pacific region.

Background of the AIFTA:

- India's Look East policy was reciprocated by similar interests of many ASEAN countries to expand their interactions westward.
- After India became a sectoral dialogue partner of ASEAN in 1992, India saw its trade with ASEAN increase relative to its trade with the rest of the world.
- Between 1993 and 2003, ASEAN-India bilateral trade grew at an annual rate of 11.2%, from US\$2.9 billion in 1993 to US\$12.1 billion in 2003.
- Total Indian FDI into ASEAN from 2000 to 2008 was US\$1.3 billion.
- Acknowledging this trend and recognising the economic potential of closer linkages, both sides recognised the opportunities to pave the way for the establishment of an ASEAN–India Free Trade Area (FTA).

Structure of the AIFTA:

- The signing of the ASEAN-India Trade in Goods Agreement paves the way for the creation of one of the world's largest FTAs – a market of almost 1.8 billion people with a combined GDP of US\$2.8 trillion. It sees tariff liberalisation of over 90 percent of products traded between the two dynamic regions, including the so-called “special products”.
- The products include palm oil (crude and refined), coffee, black tea and pepper.

Criticism:

- While there are many benefits to the ASEAN-India FTA, there is concern in India that the agreement will have several negative impacts on the economy.
- Opening-up its market: This FTA will allow them to increase the market access of their products.
- **No Specific Gains:** It is criticised, however, that India will not experience as great an increase in market access to ASEAN countries as ASEAN will in India.
- **Export driven ASEAN:** The economies of the ASEAN countries are largely export-driven. Considering India's expansive domestic market, the ASEAN countries will look eagerly towards India as a home for its exports.
- Huge trade deficit: Since the early 2000s, India has had an increasing trade deficit with ASEAN. It is feared that a gradual liberalisation of tariffs and a rise in imported goods into India will threaten several sectors of the economy.
- **Inaccessible Markets:** As a dominant exporter of light manufacturing products, ASEAN has competitive tariff rates that make it difficult for India to gain access to the industry market in ASEAN countries.

- **Cheaper Imports:** The state of Kerala is an important exporter in the national export of plantation products. It fears that cheap imports of oil palm, rubber, coffee, and fish would lower domestic production, adversely affecting farmers and ultimately its economy.

5. Europe as a valuable strategic partner

Why in News?

- Last week's in-person summit in Delhi was with the Danish prime minister, Mette Frederiksen.

Europe as a Valuable Partner:

- Few Asian countries view Europe with strategic suspicion. Many in Asia see Europe as a valuable partner.
- As the deepening confrontation between the US and China begins to squeeze South East Asia, Europe is widely seen as widening the strategic options for the region.
- The perspective is similar in Delhi, which now sees Brussels as a critical element in the construction of a multipolar world.
- Cultivate Europe: As External Affairs Minister Subrahmanyam Jaishankar puts it, India's strategy is to "engage America, manage China, cultivate Europe, reassure Russia, bring Japan into play".
- EU's Strategy for India: The EU outlined a strategy for India in 2018 to focus on four themes — sustainable economic modernisation, promotion of a rules-based order, foreign policy coordination, and security cooperation.
- At the summit in Portugal in May this year, the EU and India agreed to resume free trade talks and develop a new connectivity partnership that would widen options for the world beyond the Belt and Road Initiative.
- Rebalancing the international system: Above all, there is a recognition in both Delhi and Brussels that the India-EU strategic partnership is crucial for the rebalancing of the international system amidst the current global flux.
- Possibilities with smaller European countries:
- Europe looms so large in the Indian diplomatic agenda today and smaller European states draw unprecedented political attention from Delhi.
- That Denmark, a country of barely six million people, can establish a significant green partnership with India, is a reminder that smaller countries of Europe have much to offer in India's economic, technological, and social transformation.

- Luxembourg brings great financial clout, Norway offers impressive maritime technologies, Estonia is a cyber power, Czechia has deep strengths in optoelectronics, Portugal is a window to the Lusophone world, and Slovenia offers commercial access to the heart of Europe through its Adriatic Sea port at Koper.
- As India begins to realise this untapped potential, there are new openings with the 27-nation EU headquartered in Brussels.

EU's Important Role in Indo-Pacific:

- The EU's Indo-Pacific strategy is likely to have a much greater impact on the region more immediately and on a wider range of areas than military security.
- Area's of impact range from trade and investment to green partnerships, the construction of quality infrastructure to digital partnerships, and from strengthening ocean governance to promoting research and innovation.
- Defence and security are important elements of the EU's Indo-Pacific strategy that "seeks to promote an open and rules-based regional security architecture, including secure sea lines of communication, capacity-building and enhanced naval presence in the Indo-Pacific. Whatever the specific circumstances of the AUKUS deal and its impact on France, the US wants all its partners, especially Europe, to contribute actively to the reconstitution of the Asian balance of power.
- Working with Quad: The EU strategy, in turn, sees room for working with the Quad in the Indo-Pacific, while stepping up security cooperation with a number of Asian partners, including India, Indonesia, Japan, the Republic of Korea, Singapore and Vietnam.
- India is conscious that Europe can't match America's military heft in the Indo-Pacific.
- But it could help strengthen the military balance and contribute to regional security in Multiple Other Ways.

6. India invited to become full-time IEA member

Why in News?

- International Energy Agency (IEA) has invited India, the world's third-largest energy consumer, to become its full-time member.

International Energy Agency (IEA):

- The IEA is an autonomous intergovernmental organization established in the framework of the Organisation for Economic Co-operation and Development (OECD) in 1974 in the wake of the 1973 oil crisis.

- Based in Paris, IEA was initially dedicated to responding to physical disruptions in the supply of oil, as well as serving as an information source on statistics about the international oil market.
- In the decades since, its role has expanded to cover the entire global energy system, encompassing traditional energy sources such as oil, gas, and coal as well as cleaner and faster growing ones such as solar PV, wind power and biofuels.
- It is best known for the publication of its annual World Energy Outlook.

Role and Responsibility:

- The Agency's mandate has broadened to focus on providing analysis, data, policy recommendations and solutions to help countries ensure secure, affordable and sustainable energy for all.
- In particular, it has focused on supporting global efforts to accelerate the clean energy transition and mitigate climate change.
- The IEA has a broad role in promoting rational energy policies and multinational energy technology co-operation with a view to reaching net zero emissions.
- India and IEA:
- India, in March 2017, became an associate member of the Paris-based body which advises industrialised nations on energy policies.
- Today the IEA acts as a policy adviser to its member states, as well as major emerging economies such as Brazil, China, India, Indonesia and South Africa to support energy security and advance the clean energy transition worldwide.

Significance of the Invitation:

- This proposal if accepted will require New Delhi to raise strategic oil reserves to 90 days requirement.
- India is becoming increasingly influential in global energy trends.

7. Explained: Patrolling Points along LAC

Why in News?

- The standoffs between Indian and Chinese troops in Ladakh on the Line of Actual Control (LAC), where initial steps towards disengagement have taken place, are around a number of patrolling points or PPs in Galwan, Hot Springs and Gogra areas.



What exactly are Patrolling Points?

- PPs are patrolling points identified and marked on the LAC, which are patrolled with a stipulated frequency by the security forces.
- They serve as a guide to the location of the LAC for the soldiers, acting as indicators of the extent of 'actual control' exercised on the territory by India.
- By regularly patrolling up to these PPs, the Indian side is able to establish and assert its physical claim about the LAC.

Are all the Patrolling Points Numbered?

- Some of the PPs are prominent and identifiable geographical features, such as a pass, or a nala junction where no numerals are given.
- Only those PPs, where there are no prominent features, are numbered as in the case of PP14 in Galwan Valley.
- Are all on the Patrolling Points bang on the LAC?
- Mostly, yes. Except for the Depsang plains in northern Ladakh, where PP10, PP11, PP11A, PP12 and PP13 – from Raki Nala to Jivan Nala – do not fall on the LAC.
- These are short of the LAC, on the Indian side.

Are these Patrolling Points not manned?

- The PPs are not posts and thus not manned.
- Unlike on the Line of Control (LoC) with Pakistan, the border with China is not physically held by the Army all along.
- They are just physical markers on the ground, chosen for their location and have no defensive potential or tactical importance for the Army.
- If the Patrolling Points are not manned, how is the claim actually asserted?
- The claim is asserted by the Army or joint Army-ITBP patrols as they show more visible presence in these areas.
- This is done by physically visiting PPs with a higher frequency, as the deployment has moved closer to the LAC and due to improved infrastructure.
- As the Chinese may not see when the Indian patrols visit these PPs, they will leave come cigarette packets or food tins with Indian markings behind.
- That lets the Chinese know that Indian soldiers had visited the place, which indicates that India was in control of these areas.

Who has given these Patrolling Points?

- These PPs have been identified by the high-powered China Study Group, starting from 1975 when patrolling limits for Indian forces were specified.
- It is based on the LAC, after the government accepted the concept in 1993, which is also marked on the maps with the Army in the border areas.
- But the frequency of patrolling to PPs is not specified by the CSG – it is finalised by the Army Headquarters in New Delhi, based on the recommendations made by the Army and ITBP.

What is this Frequency?

- The frequency of reaching various PPs are given in the annual patrolling programme.
- Based on the terrain, the ground situation and the location of the LAC, the duration for visiting each PP is specified – it can vary from once a month to twice a year.
- Major friction area: Hot Springs:
- Hot Springs lies in the Chang Chenmo River valley, close to Kongka La, a pass that marks the Line of Actual Control.
- India's Patrolling Point 15, it is not a launchpad for any offensive action though the area did see action before and during the 1962 war.
- China's unwillingness to pull back its platoon-sized unit from Hot Springs is a sign of the difficulties that lie in normalising the situation.
- The PLA has traditionally had a major base east of Kongka La.
- The pass also marks the border between two of China's most sensitive provinces – Xinjiang to the north and Tibet to the south.

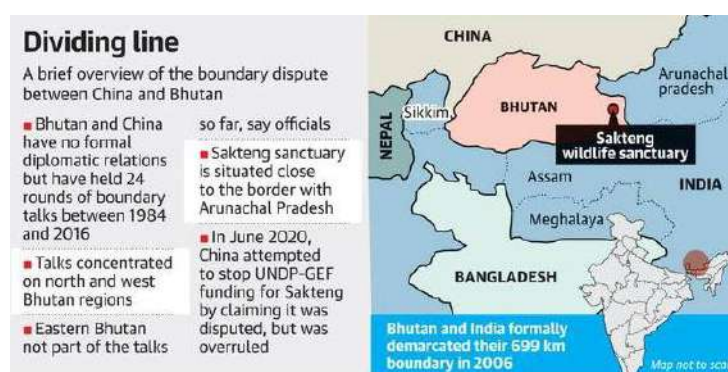
8. Bhutan-China Border Agreement

Why in News?

- In a step towards resolving their boundary disputes, Bhutan and China signed an agreement on a three-Step roadmap to help speed up talks to “break the deadlock” in negotiations.

Bhutan-China Border Issues:

- Bhutan shares an over 400-km-long border with China.



- Doklam: China wants to exchange the valleys to the north of Bhutan with the pasture land to the west (including Doklam), totalling 269 square kilometres.
- Jakarlung and Pasamlung valleys: located near Tibet to Bhutan's North, which measure 495 sq. kms.
- Sakteng Wildlife Sanctuary Project: China claims this area (near to Arunachal Pradesh) in eastern Bhutan as its own.
- What is the recent agreement?
- The roadmap "for Expediting the Bhutan-China Boundary Negotiations", is expected to progress on the boundary talks process that has been delayed for five years.
- It was stalled due to the Doklam standoff in 2017, and then by the Covid Pandemic.
- Although China and Bhutan do not have official diplomatic relations they have engaged in 24 rounds of ministerial-level talks to resolve their border dispute.

Implications for India:

- The boundary issue between China and Bhutan is special because it not only relates to Bhutan but also has become a negative factor for China-India ties.
- China control much of the Doklam: Since the 2017 stand-off with India, Beijing has already strengthened its de facto control over much of the Doklam plateau, located strategically along the India-China-Bhutan trijunction.
- Bhutan supports it: This agreement has been equally endorsed and appreciated by Bhutan and China.
- Deadlock at LAC talks: Its timing is particularly significant New, given India-China border talks on their 17-month-old standoff at the Line of Actual Control appear to have hit an deadlock.
- India's strategic risks: This has big implications for India, since the Doklam swap would have given China access to the strategically sensitive "chicken neck" of the Siliguri corridor.

India's interest

A. Doklam

- ✓ The Doklam plateau remains hugely critical for India due to the Siliguri Corridor that lies to the south of Doklam.
- ✓ The corridor, also known as the 'Chicken's Neck', is a 22-km wide major arterial road connecting mainland India with its northeastern states and thus it is a highly sensitive area for China.

B. Sakteng: the hotspot

- ✓ The Sakteng sanctuary adjoins West Kameng district and Tawang districts in India's Arunachal Pradesh state.
- ✓ Its strategic value lies in its proximity to Arunachal Pradesh, where China claims around 90,000 sq km of Indian territory.
- ✓ Tawang, the major bone of contention between India and China in the eastern sector of their border dispute, lies to the northeast of the Sakteng.
- ✓ Bhutan has to balance its ties with India as well as China.
- ✓ We need to explore channels that India can activate with Bhutan when it comes to the highly sensitive matter of settling the boundary dispute between them and China.

9. EU, India and the Indo-Pacific

Why in News?

- Last month, the EU released its “EU strategy for cooperation in the Indo-Pacific”. This document is very rich and needs to be analysed in the context of the rapprochement between the EU and India, which culminated in the June EU-India summit, a “turning point” according to some analysts.

Important takeaways from EU's Indo-Pacific strategy:

- The EU strategy in the Indo-Pacific appears to be over-determined by China's expansionism.
- “The display of force and increasing tensions in regional hotspots such as in the South and East China Sea and in the Taiwan Strait may have a direct impact on European security and prosperity,” the document says.
- If security interests are highlighted in the beginning, they are rather low in the list of the objectives of the EU Indo-Pacific strategy, which are listed as: “Sustainable and inclusive prosperity; green transition; ocean governance; digital governance and partnerships; connectivity; security and defence; human security”.
- Many paragraphs of the document are dedicated to values, including human rights.

India does not Figure Prominently in the Policy Document:

- In terms of partnerships, India does not figure very prominently.
- By contrast, ASEAN is presented as “an increasingly important partner for the EU”.
- However, India appears in the list of the countries which already have an Indo-Pacific strategy and with which the EU is interested in a deeper “engagement”, a list made of ASEAN, Australia, India, Japan, New Zealand, the Republic of Korea, the UK and US.

- However, the document does not mention the role India could play in value-chain diversification, a top priority of the EU since the Covid-19 pandemic in particular.
- Yet, India is mentioned few pages later in a similar perspective when it is said that the EU will help “low and middle-income Indo-Pacific partners to secure access to the Covid-19 vaccine through the Covax facility and through other means”.
- What the French see as India’s main asset, its strategic dimension, is not central in the EU document.
- India is listed as the EU’s first partner only in one area: “under the project Enhancing Security Cooperation in and with Asia (ESIWA), which covers counter-terrorism, cybersecurity, maritime security and crisis management.
- The pilot partners are India, Indonesia, Japan, the Republic of Korea, Singapore and Vietnam, with EU military experts already operating in Indonesia and in Vietnam.”
- Understanding the German influence on the policy document
- Thus, the EU strategy for cooperation in the Indo-Pacific is more in tune with the German vision of the Indo-Pacific than with the French one.
- The fact that the German approach prevails in the EU document is a reflection of the influence of Berlin’s weltanschauung (worldview) in Europe — something Brexit has accentuated, Great Britain’s Indo-Pacific strategy being similar to France’s.
- But China’s attitude may force Germany — and the EU — to change their mind in the near future.

10.G7 Trade Ministers’ Digital Trade Principles

Why in News?

- The Group of Seven wealthy nations agreed on a joint set of principles to govern cross-border data use and digital trade.

What are the Digital Trade Principles?

- Open digital markets: Digital and telecommunications markets should be competitive, transparent, fair, and accessible to international trade and investment.
- Cross-border data flows: To harness the opportunities of the digital economy and support the trade of goods and services, data should be able to flow freely across borders with trust.
- Safeguards for workers, consumers, and businesses: Labour protections must be in place for workers who are directly engaged in or support digital trade, providing decent conditions of work.

- Digital trading systems: To cut red tape and enable more businesses to trade, governments and industries should drive forward the digitization of trade-related documents.
- Fair and inclusive global governance: Common rules for digital trade should be agreed and upheld at the World Trade Organization.

Group of Seven:

- The G-7 or 'Group of Seven' includes Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States.
- It is an intergovernmental organization that was formed in 1975 by the top economies of the time as an informal forum to discuss pressing world issues.
- Initially, it was formed as an effort by the US and its allies to discuss economic issues.
- The G-7 forum now discusses several challenges such as oil prices and many pressing issues such as financial crises, terrorism, arms control, and drug trafficking.
- It does not have a formal constitution or a fixed headquarters. The decisions taken by leaders during annual summits are non-binding.
- Canada joined the group in 1976, and the European Union began attending in 1977.

Evolution of the G-7:

- When it started in 1975—with six members, Canada joining a year later—it represented about 70% of the world economy.
- And it was a cosy club for tackling issues such as the response to oil shocks.
- Now it accounts for about 40% of global GDP.
- Since the global financial crisis of 2007-09 it has sometimes been overshadowed by the broader G20.
- The G-7 became the G-8 in 1997 when Russia was invited to join.
- In 2014, Russia was debarred after it took over Crimea.

11. Crises in Pakistan is an occasion to reflect on the long-term Regional Consequences

Why in News?

- Whether it can or should make a difference to Pakistan's internal politics, India must pay greater attention to the internal dynamics of our most difficult neighbour and more purposefully engage a diverse set of actors in that polity.

India's Interventions in Internal Affairs of Neighbours:

- Except for Pakistan, in most other countries of the subcontinent, India is drawn quickly into their internal political arguments.
- Delhi has always exercised some influence on the outcomes of those contestations.
- It is enough to note that India's interventions are a recurring pattern in the subcontinent's international relations.
- Even when Delhi is reluctant to get into the weeds of these conflicts, the competing parties in the neighbourhood demand India's intervention on their behalf.
- All of the contestants, of course, resolutely oppose India's meddling when it goes against them. But Delhi has rarely been a decisive player in Pakistan's internal politics.
- Delhi's hands-off attitude is surprising, given India's huge stakes in the nature of Pakistan's policies and their massive impact on regional security.

Current Crises in Pakistan:

- Internal crises: Among the many challenges confronting Pakistan is the fresh breakdown in civil-military relations.
- Pakistan's economy is in a tailspin as it struggles to negotiate a stabilisation package with the International Monetary Fund.
- The militant religious movement Tehreek-e-Labbaik Pakistan (TLP) has mounted a fresh march against the capital demanding the release of its arrested leader.
- External crises: The internal crises are sharpened by worsening external conditions.
- In Afghanistan, Pakistan has succeeded in restoring the Taliban to power.
- The celebrations have not lasted too long; the long-awaited victory is turning sour.
- The Arab Gulf states that have been fast friends of Pakistan are now tilting towards India.
- Once a favourite partner of the West, Pakistan today faces tensions in its ties with the US and Europe. More broadly, nuclear weapons and a powerful army seem unable to stop Pakistan's relative decline in relation to not just India but also Bangladesh.
- Pakistan's economy is now 10 times smaller than that of India and is well behind Bangladesh.

Suggestions:

- Whether it can or should make a difference to Pakistan's internal politics, India must pay greater attention to the internal dynamics of our most difficult neighbour and more purposefully engage a diverse set of actors in that polity.

- For Delhi, it is always about narrow political arguments with Rawalpindi and Islamabad; it is as if the people of Pakistan do not exist.
- For India, the crises in Pakistan should be an occasion to reflect on the long-term regional consequences of Pakistan's internal turbulence.
- It might be argued that that unlike elsewhere in the neighbourhood, Delhi's leverage in Pakistan's politics is limited. But it is by no means negligible.

12.A festering crisis in the Palk Strait

Why in News?

- Five fishermen from Tamil Nadu have lost their lives in the Palk Strait in 2021 in reported incidents between the Indian fishermen and Sri Lankan Navy.
- Indian fishermen while trying to earn a living, reportedly cross the International Maritime Boundary Line, between India and Sri Lanka.
- They are often intercepted in Sri Lankan waters by the Sri Lankan Navy for "illegal fishing".
- Tamil Nadu fishermen's associations have accused the Sri Lankan Navy of brutally attacking the fishermen, while Sri Lanka has denied the allegations.

Palk Strait issue:

- The fishermen's deaths serve as a stark reminder of the unresolved fisheries conflict in the Palk Strait.
- The issue has become acute from the time Sri Lanka's 30 year-long civil war ended in 2009. At the end of the civil war, Sri Lanka's northern Tamil fishermen, who were displaced and barred access to the sea, began returning to their old homes. The resumption of fishing activities from North Sri Lankan fishermen led to tension with Tamil fishermen on the other side of the sea over the marine resources of the region.

Bottom Trawling:

- The practice of bottom trawling by Tamil Nadu fishermen is a grave concern.
- The bottom trawling fishing method involves dragging large fishing nets along the seabed, scooping out prawns, small fishes and virtually everything else at one go. This practice is deemed destructive and antithetical to sustainable fishing practices. It involves a large volume of bycatch which could be destructive to fishing populations. As a result, the fish catch has fallen drastically and many varieties of fish have been vanishing.

- Also, incessant bottom trawling along the coast of Tamil Nadu over the years has meant that the Tamil Nadu fishermen are drawn to the relatively resource-rich Sri Lankan waters.

Livelihood issue:

- The daily wage fishermen are largely dependent on fishing and any disruption in the fishing activity poses a huge risk to the lives of their families.
- While the vessel owners have been able to reap substantial profits, the fishermen receive only meagre incomes while facing huge risks to their lives.

Approach of Sri Lanka:

- The Sri Lankan state's response to the problem has been largely a military and legal one, tasking its Navy with patrolling the seas and arresting "encroachers", banning trawling, and levying stiff fines on foreign vessels engaged in illegal fishing in its territorial waters.
- This has been inconsistent with the need for a more holistic humanitarian approach as proposed by the Indian side.

Impact on the bilateral relation between India and Sri Lanka:

- The Palk Bay conflict could be the biggest test yet to the bilateral relationship between India and Sri Lanka.
- The issue has gained political mileage in both countries and hence could have a disastrous impact on the relationship.

13. Energy cooperation as the backbone of India-Russia ties

Why in News?

- With its abundant energy sources and appetite for trade diversification, Russia could be an ultimate long-term partner of India as it tries to diversify its trade relations.

Energy Partnership:

- Indian Prime Minister in a virtual address at 6th Eastern Economic Forum (EEF) in Russia's Vladivostok said that "India-Russia energy partnership can help bring stability to the global energy market."
- Indian and Russian Energy Ministers announced that the countries' companies have been pushing for greater cooperation in the oil and gas sector beyond the U.S.\$32 billion already invested in joint projects.
- India's Minister for Petroleum and Natural Gas Hardeep Singh Puri referred to Russia as the largest investor in India's Energy Sector.

- One of the examples of cooperation between the two countries in energy transformation is the joint venture between India's Reliance Industries Ltd. and Russia's Sibur, the country's largest petrochemicals producer.
- Apart from accounting for most of the Indian butyl rubber market, Reliance Sibur Elastomers exports its products to Asia, Europe, the United States, Brazil and other countries.
- A few years ago, Rosneft invested U.S.\$12.9 billion in India's second-largest private oil refiner, Essar Oil, renamed Nayara Energy, marking it one of the most significant foreign investments in years.
- Partnership in renewable: In efforts to transition to green energy, India has recently achieved a significant milestone of completing the countrywide installation of 100 gigawatts of total installed renewable energy capacity, excluding large hydro.
- A recent Deloitte report has forecasted that India could gain U.S.\$11 trillion in economic value over the next 50 years by limiting rising global temperatures and realising its potential to 'export decarbonization'.
- Unknowns of climate change and threats of a new pandemic suggest that the country should accelerate its energy transition. Russia, one of the key global players across the energy market, could emerge as an indispensable partner for such a transition.
- Partnership in nuclear energy: Russian companies have been involved in the construction of six nuclear reactors in the Kudankulam nuclear power project at Tamil Nadu.
- India and Russia secure the potential of designing a nuclear reactor specifically for developing countries, which is a promising area of cooperation.
- India's nuclear power generation capacity of 6,780 MW may increase to 22,480 MW by 2031, contributing to the country's efforts to turn to green energy.

Way Forward:

- In September, almost all of Russia's major energy companies were interested in projects in India, Russia's Energy Minister said at the Vladivostok forum in September, adding that he sees prospects for energy cooperation in all areas.
- However, the current bilateral exchange rate needs to accelerate for India to grasp its potential from energy transformation.