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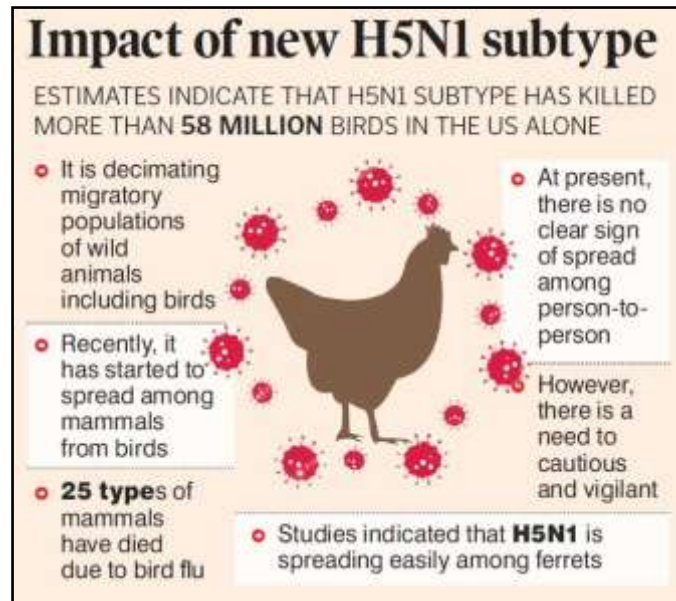
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Topic 1. H5N1 SPREADS TO MAMMALS

Important for the subject : Science and technology



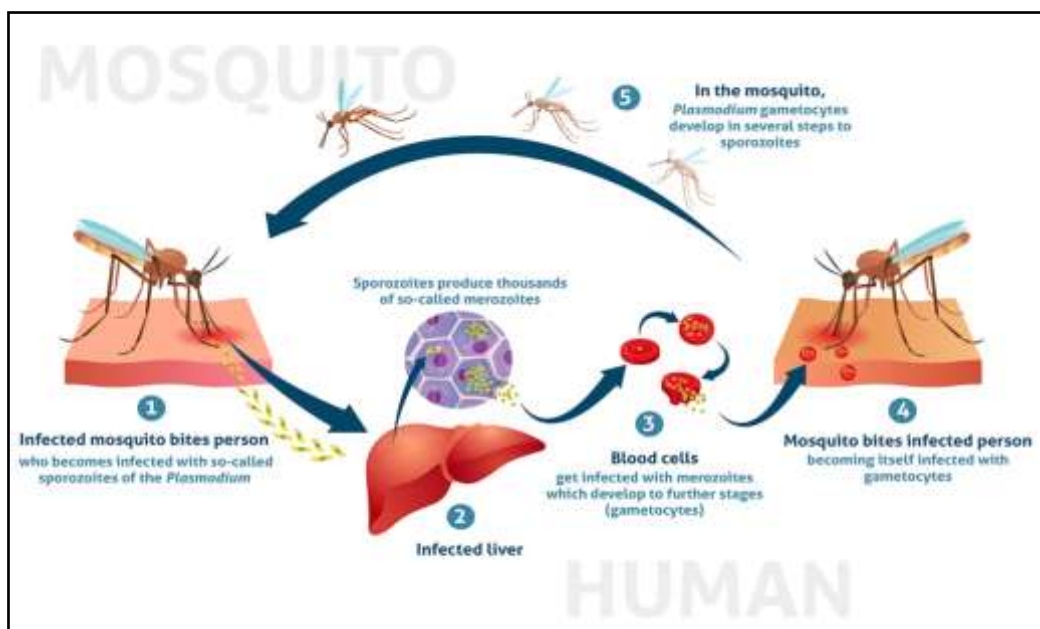
Uncontrolled spread of the virus can be catastrophic to the already endangered bird species globally, leading to the mass extinction of several species.

- Since 2022, the **virus has infected over 100 million birds across the globe**, resulting in the deaths of over 50 million and culling of millions of poultry.
- This year, the world has been witnessing one of the worst-ever documented outbreak of the **highly pathogenic avian influenza H5N1** killing millions of birds.
- The virus, which is known to cause severe disease and death in birds, has also been detected in mammalian species and also in humans. This has put health authorities on high alert regarding the implications of the large outbreak on public health.
- The **transmission of H5N1 from birds to mammals is rare**, but when it does occur, it can be a **cause for concern**, as the **virus could accumulate mutations** and acquire the ability to potentially initiate human outbreaks.
- H5N1 has a **high mortality rate of over 60% in humans** and is primarily transmitted to **humans through close contact with infected birds or animals**, either through handling infected poultry or exposure to contaminated environments. In the recent months, a **few sporadic cases of human H5N1 infections have also been reported from Ecuador, Cambodia, and more recently in Chile.**

- Given the ongoing threat of an influenza pandemic, monitoring the spread in mammalian populations is important in areas of close contact between humans and animals. However, since the **virus does not yet transmit efficiently among humans, the World Health Organization (WHO) has assessed the risk of H5N1 to humans to be low.**
- However, the large and unabated outbreak in avian species and not so rare mammalian spillovers could potentially provide the virus a chance to adapt for mammalian transmission.

Topic 2. IN MALARIA VACCINE RESEARCH, BRIGHT HOPES AND FORMIDABLE CHALLENGES

Important for the subject : Science and technology



Malaria Facts and Features

Life-threatening disease spread to humans by some types of **mosquitoes** Mostly found in **tropical countries** **Higher risk of severe infection** – Infants, children under 5 years, pregnant women, travelers and people with HIV or AIDS Preventable by avoiding mosquito bites and curable with medicines Malaria infection during **pregnancy** can also cause **premature delivery** or delivery of a baby with **low birth weight**. Kills over 4,00,000 people each year

Vector and Causes

- Spreads through the bites of some infected **female Anopheles mosquitoes** Blood transfusion and contaminated needles transmit malaria

Disease causing Microbes

5 Plasmodium parasite species cause malaria in humans.

- **Falciparum and P.vivax** pose the greatest threat. Falciparum – deadliest malarial parasite and the most prevalent on the African continent. **95% of all cases of P.falciparum occur in the African region** and are associated with severe disease and disease-associated mortality.
- **vivax – geographically most widespread** in tropical and sub-tropical regions. Dominant in most countries outside of sub-Saharan Africa
- Other 3 Plasmodium species infecting humans – **malariae, P. ovale and P. knowlesi**

Symptoms

Most common early symptoms – **fever, headache and chills**

- Symptoms usually start within 10–15 days of getting bitten by an infected mosquito Symptoms may be **mild to severe**.
- **Severe symptoms** include – Abnormal bleeding, difficulty in breathing, jaundice, impaired consciousness, multiple convulsions. Early treatment for mild malaria stops infection from becoming severe
- The vaccine has been shown to significantly reduce malaria, and deadly severe malaria, among young children.

Two New Breakthrough in Vaccination

- Since October 2021, WHO recommends broad use of the RTS, S /AS01 malaria vaccine among children living in regions with moderate to high **falciparum** malaria transmission – high transmission African countries **R21**, which like RTS, S works against the **liver stage of the parasite**

About RTS, S Vaccine

- A result of collaborative efforts of several organizations around the world including GlaxoSmithKline (GSK), Walter Reed Army Institute of Research, PATH Malaria

Vaccine Initiative, Bill and Melinda Gates Foundation, and Wellcome Trust.

- Taken more than 30 years and several hundred million dollars to develop Relatively low efficacy of 30-40%
- Already been administered to over a million children in pilot trials since 2019 resulted in a **significant reduction in severe malaria and hospitalization** in malaria-endemic countries like **Ghana, Kenya, and Malawi**.
- Hyderabad-based Bharat Biotech – granted a licence to manufacture this vaccine. Expected to be the only global manufacturer of the vaccine by 2029. GlaxoSmithKline (GSK) will provide the vaccine's key ingredient adjuvant.

About R21 Vaccine

- Developed by scientists at Oxford University.
- Formulated with proprietary **adjuvant from Novavax called Matrix M**. This adjuvant has also been used in the **protein based Covid-19 vaccine** manufactured and marketed in India by SII under the brand name
- Crucial large scale phase 3 trials of this vaccine have been conducted in several malaria endemic countries in Africa after successful phase 2 clinical studies.
- Regulatory authorities in **Ghana and Nigeria** have already **approved** the vaccine in their countries. Submitted for WHO consideration.

What is an Adjuvant

- An adjuvant is an ingredient used in some vaccines that helps **create a stronger immune response** in people receiving the vaccine. In other words, adjuvants help vaccines work better.

Initiatives to reduce malarial causes and deaths

- **Roll Back Malaria** launched by **WHO** in 1998 – to reduce deaths from malaria by half by 2010.
- A major malaria eradication programme launched in 2015. These have resulted in **significant reduction in malaria causes and deaths**.

Challenges Associated

- **Malaria parasite** is extremely complex and elusive, with a **life cycle involving multiple**

stages – very difficult to develop efficacious vaccines against malaria.

- Of the more than 100 candidates that have entered clinical trials in the last three decades, none shown the **benchmark efficacy of 75% set by the WHO**.
- **Covid-19** pandemic has disrupted malaria control, diagnosis, and treatment measures.

Other Facts

- **WHO's guiding theme 2023** – “Time to deliver zero malaria: invest, innovate, implement”
- **World Malaria Day**— observed every year on **April 25**

Serum Institute of India

- Serum Institute of India (SII) is a Pune based **world's largest vaccine manufacturer** by number of doses produced and sold globally. SII has already established the capacity to produce 200 million doses annually, underlining its commitment to the fight against malaria and its eradication.

Research in India

- **Controlled human malaria infection (CHMI) studies** have the potential to fasttrack initial assessments of vaccine efficacy and also facilitate the first clinical evaluation of vaccines involving fewer adult Important for the subjects.
- Basic malaria research is being carried out in many academic institutions in India. But human challenge model or CHMI is not set up.
- Scientists at the **International Centre for Genetic Engineering and Biotechnology (ICGEB)**, New Delhi have successfully developed and produced two experimental **recombinant blood stage malaria vaccines** against **falciparum** and **P.vivax** and carried out phase1 first-in-man clinical trials in India.
- CHMI studies with P.vivax vaccine for efficacy assessment has been completed in collaboration with scientists at Oxford University.
- Current and future vaccines for lower-and middle-income countries will mostly be manufactured in India. So India has to invest, integrate, and be the leader in finding solutions to combat deadly infectious diseases in the world.

About International Centre for Genetic Engineering and Biotechnology (ICGEB)

- The ICGEB is a unique intergovernmental organization initially established as a special project of UNIDO.
- Autonomous since 1994, it runs over 45 state-of-the-art laboratories, in Trieste, Italy, New Delhi, India and Cape Town, South Africa.
- Forms an interactive network with almost 70 Member States, with operations aligned to those of the United Nations System.
- It plays a key role in Biotechnology, promoting Research excellence, Training, and Technology Transfer to industry, to contribute in concrete terms to sustainable global development.
- The ICGEB currently has 66 full Member States, a further 19 countries are still pending ratification of, or accession to, the Statutes of ICGEB.

Topic 3. PM LAUNCHES 91 NEW FM TRANSMITTER IN 18 STATES

Important for the subject : Science and technology

The **PM of India inaugurated 91 FM transmitters spread across 18 states and two UTs** and asserted that the government was working towards giving people in every nook and corner of the country affordable access to technology.

- With this, **All India Radio was well on its way to expand its FM footprint nationally.**
- These FM transmitters will play a key role in a range of services be it timely dissemination of information, weather forecast for agriculture or connecting the women SHGs with new markets.

Frequency Modulation (FM)

- It is the **encoding of information in a carrier wave by varying the instantaneous frequency of the wave.** The technology is used in **telecommunications, radio broadcasting, signal processing, and computing.**
- In analog FM (radio broadcasting), the instantaneous frequency deviation – the **difference between the frequency of the carrier and its center frequency** – has a functional relation to the modulating signal amplitude.
- Digital data can be encoded and transmitted with a type of FM known as **frequency-shift**

keying (FSK), in which the instantaneous frequency of the carrier is shifted among a set of frequencies.

FM Transmitter

- It is a low-power FM radio transmitter that broadcasts a signal from a portable audio device (such as an MP3 player) to a standard FM radio.
- Most of these transmitters plug into the device's headphone jack and then broadcast the signal over an FM broadcast band frequency, so that it can be picked up by any nearby radio.
- This allows portable audio devices to make use of the louder or better sound quality of a home audio system or car stereo without requiring a wired connection.
- Being low-powered, most transmitters typically have a short range of 100-300 feet (30–91 metres), depending on the quality of the receiver, obstructions and elevation.

Topic 4. APES LIKE TO SPIN LIKE HUMANS

Important for the subject : Science and Technology

Why in News?

Just like humans, great ape species also seem to regularly enjoy stimulating their senses through spinning, possibly even in pursuit of altered mental states. Many animals, especially humans' closest relatives like chimpanzees, display behavioural attributes similar to humans. Studying these behaviours provides scientists with not just a greater understanding of the animals but also of evolution and human beings themselves.

News in Brief

- Videos of gorillas, chimpanzees and other animals engaging in human-like spinning around in circles, somersaulting, etc. went viral. They do so for stimulating their senses just like humans.
- 400 videos showing great apes and other primates engaged in spinning behaviors were amassed by cognitive scientists. Mostly captive apes, but a few were wild mountain gorillas.
- This led to a research by primatologist and evolutionary psychologist to find if other primates also do so for the same reason, that is for a fun and exhilarating experience felt

by children evidenced by the enduring popularity of playground merry-go-rounds.

- The new research suggests that humans are not alone in their pursuit of spin-induced buzzes.

Research Findings

- Other great ape species also seem to regularly enjoy stimulating their senses through spinning, possibly even in pursuit of altered mental states.
- Spinning, whirling, back flipping, somersaulting are not distinctly human activity as thought of so far.
- Spinning speed was rivaling professionally trained human dancers and aerialists – average rotation velocity of 1.43 revolutions per second.
- The longest spin session lasted 28 revolutions, and the fastest was a brainscrambling 4 revolutions per second by a bonobo.
- The longer an ape spun, the more likely it was to show signs of dizziness, such as letting go of the rope and immediately sitting or lying down.
- Apes tended to repeat the process of spinning and stopping, engaging in an average of three bouts of spinning per session.
- “Play faces” made by the animals while spinning – Imply that they were having fun rather than only seeking a way to relieve themselves of boredom in captivity.

Animals Getting High

- These animals also engage in other activities that can scramble the senses, including consuming fermented fruits containing alcohol and ingesting naturally occurring psychedelic substances.
- It is debated if this behavior is done on purpose or by accident.

Future Prospects of Research

- Such studies may provide data needed to explore behaviors that may be evolutionary precursors to the human desire to experience altered mental states.
- Collecting evidence of other species, including grizzly bears and pandas, that appear to enjoy activities that may make them dizzy may open a larger study.
- Researching such behavior may reveal that we are not the only animals who engage in

behaviors that intentionally produce altered states of consciousness.

- Systematic research will help us learn more about the taxonomy of getting high and change the feeling that we are all that unique.

Topic 5. DEDICATED COMMAND CYBER OPERATIONS FOR THE INDIAN ARMY

Important for the subject : Science and Technology

The Indian Army will now raise dedicated specialized agencies in each of its six operational or regional commands across the country to handle the cyberspace domain.

Army Commanders Conference

- Between April 17 and April 23, the **Army Commanders Conference** was held.
- The conference saw deliberations over wide-ranging Strategic, Training, Human Resource Development, and Administrative aspects and took key decisions in shaping the Army for the future.
- A number of welfare measures and initiatives were decided to be implemented for troops as well as veterans during the conference. One of these measures is the Command Cyber Operations and Support Wings.

About Command Cyber Operations and Support Wings (CCOSW):

- The Indian Army is rapidly migrating towards internet centricity, which entails an increased reliance on modern communication systems at all levels.
- The **CCOSWs will assist the Indian Army's formations in taking up cyberspace security** challenges posed by the growing warfare capabilities of adversaries.

Need & Significance of the CCOSW:

- This is an urgent necessity in the backdrop of China developing a wide array of cyber weapons to degrade or destroy an adversary's military assets and strategic networks even before the actual conventional war kicks off.
- China also regularly engages in malicious cyber activities as well as exploits cyberspace for its **"grey zone warfare"**.
- **Grey zone warfare basically revolves around exploitation of the operational space**

between peace and war to change the status quo or coerce an adversary.

- The Army believes the CCOSWs will help to safeguard its networks and increase the preparedness levels in this fifth dimension of warfare after land, sea, air and space.
- This step will lead to an overall strengthening of the cyber-security posture of the force for both conventional operations as well as grey zone warfare.

Comparing India's Cyber warfare Capabilities with Other Countries:

- India has so far lagged behind in developing cyber warfare capabilities. It was only in 2019 that the Union government approved the **creation of a small triservice Defence Cyber Agency (DCA) at the apex level.**
- **China, in contrast, has a major strategic support force** to oversee the People's Liberation Army's space, cyber and electronic warfare operations.
- **The US, too, has a huge Cyber Command,** led by a four-star general, to launch a "full spectrum" war if required as well as protect over 15,000 American military networks from attacks round-the-clock.

Topic 6. INS TARKASH

Important for the subject: Science and Technology

INS Tarkash from the Indian Navy recently reached Port Sudan to help in the evacuation of stranded Indians as **part of "Operation Kaveri"**. **INS Tarkash is the third ship** to join the evacuation **after INS Sumedha and INS Teg.**

About INS Tarkash:

- It is a state-of-the-art stealth frigate of the Indian Navy equipped with a versatile range of weapons.
- Tarkash belongs to the Talwar class of guided missile frigates. These are modified Krivak III class frigates built by Russia.
- It was built by the Yantar shipyard in Kaliningrad, Russia. It was commissioned into Indian Navy service on 9 November 2012 at Kaliningrad and joined the Western Naval Command on 27 December 2012.
- It is also **equipped with BrahMos missiles** instead of the Klub-N missiles, which makes it different from the earlier flight of Talwar-class ships.

INS Sumedha

- INS Sumedha is the third ship of the Saryu-class Naval Offshore Patrol Vessels (NOPV) of the Indian Navy. INS Sumedha was designed and constructed indigenously by Goa Shipyard Limited. It is fitted with a state-of-the-art weapon and sensor package.
- This ship is **designed to undertake support operations, coastal and offshore patrolling, ocean surveillance, search and rescue (SAR) operations, and humanitarian assistance and disaster relief (HADR).**

INS Teg

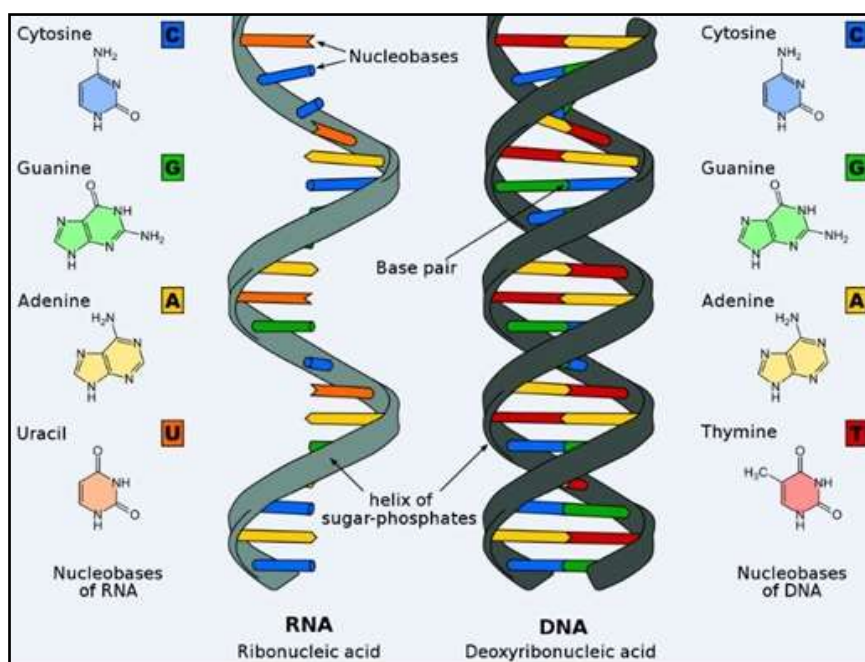
- INS Teg is the fourth Talwar-class frigate constructed for the Indian Navy. Just like the other Talwar-class frigates, INS Teg was built by the Yantar shipyard in Kaliningrad, Russia.
- The ship is named after “Teg”, which is a short single-edged curved sword, traditionally used by Sikhs. INS Teg also uses **BrahMos missiles.**

Operation Kaveri

- It is a rescue operation being carried out by the Indian Government **to bring back Indian citizens stranded in Sudan.**
- According to the official data, the number of Indians in Sudan is around 4,000. Sudan has been witnessing deadly fighting between the country’s army and a paramilitary group, the paramilitary Rapid Support Forces (RSF), that has reportedly left several hundred’s dead.
- It was triggered by **disagreement over an internationally backed plan to form a new civilian government four years after the fall of autocrat Omar al-Bashir and two years after the military coup. Both sides accuse the other of thwarting the transition.**

Topic 7. UNRAVELLING DNA'S STRUCTURE

Important for the subject : Science and Technology



Unravelling DNA's structure- A landmark achievement whose authors were **not fairly credited**. History has acknowledged how **Rosalind Franklin** was sidelined. Much has changed since 1953. However, **women are still massively underrepresented in the higher echelons of science**.

DNA:

- **Nucleus of a living cell is responsible for this transmission of inherent characters**, also called **heredity**.
- The **particles in nucleus of the cell**, responsible for heredity, are called **chromosomes** which are **made up of proteins and** another type of biomolecules called nucleic acids.
- **Nucleic acids are responsible for the transfer of characters from parents to off springs**. There are two types of nucleic acids — **DNA and RNA**.
- A nucleic acid **containing deoxyribose** is called **deoxyribonucleic acid (DNA)** while that which **contains ribose** is called ribonucleic acid (RNA).
- Both DNA and RNA contain **Adenine, Guanine and Cytosine**. The fourth base is **Thymine in DNA and Uracil in RNA**. The structure of DNA is a **double strand [helix]** whereas **RNA is a single strand molecule**. Hydrogen bonds bind the nitrogenous bases

of the two separate polynucleotide strands to make double-stranded DNA.

- The DNA backbone is resistant to cleavage, and both strands of the **doublestranded structure store the same biological information**. Biological information is replicated as the two strands are separated.
- Within cells, DNA is **organized into long structures called chromosomes**. During cell division these **chromosomes are duplicated in the process of DNA replication**, providing each cell its own complete set of chromosomes.
- **Eukaryotic organisms** (animals, plants, fungi, and protists) **store most of their DNA inside the cell nucleus and some of their DNA in organelles, such as mitochondria or chloroplasts**.
- In contrast, **prokaryotes** (bacteria and archaea) store their DNA **only in the cytoplasm**. DNA is the **chemical basis of heredity and have the coded message for proteins to be synthesized** in the cell.

DNA Fingerprinting:

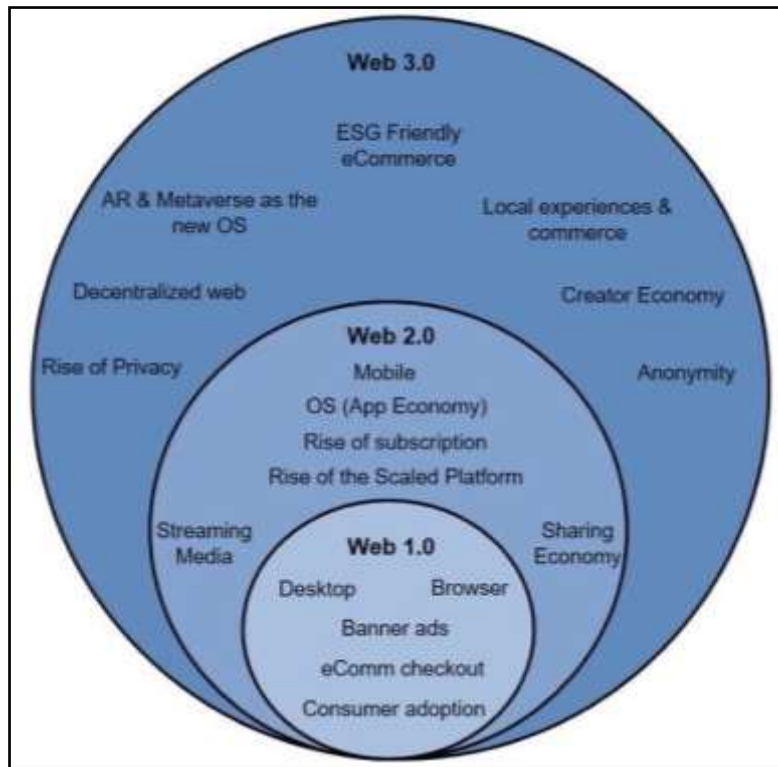
- DNA fingerprinting is a technique that is **used to identify individuals by analyzing their DNA**. It is also called DNA profiling or genetic fingerprinting. DNA fingerprinting is based on the fact that **every person has a unique DNA sequence, except for identical twins**, who have the same DNA sequence.
- The process of DNA fingerprinting involves **extracting DNA from a sample**, such as blood or saliva, and then **analyzing it to identify the unique DNA sequence**.
- This is done by using techniques such as **polymerase chain reaction (PCR)**, gel electrophoresis, and Southern blotting. DNA fingerprinting has many applications, including **forensic investigations, paternity testing, and genetic research**.

DNA Sequencing:

- DNA sequencing is a **process of determining the nucleotide sequence** of a DNA molecule, which **involves reading the DNA molecule's order** of nucleotide bases, namely **adenine (A), cytosine (C), guanine (G), and thymine (T)**.
- This process has **revolutionized the study of genetics** and has numerous applications in various fields, including medical research, forensic science, evolutionary biology, and agriculture.

Topic 8. THE THIRD-GEN WEB IS ABOUT PUBLIC GOOD

Important for the subject : Science and technology



A 2021 report by the U.S.-India Strategic Partnership Forum states that the thirdgen web will be crucial for India to realise its \$1.1 trillion digital asset opportunity by 2032.

Web 3

- Web3 is **decentralized, privacy-oriented, block chain-driven and crypto-asset friendly**.
- **Decentralized data storage systems:** Web3 seeks to radically transform the manner in which data is generated, monetized, shared and circulated. Further, it advocates decentralized data storage systems with the objective of unshackling the oligopolistic grip of technology behemoths over data.
- **Overcome the data storage barriers:** Web3 has file-sharing systems such as the Inter-Planetary File System which are cryptographically protected, more secure and capable of functioning off Internet and off block chains. In this manner, Web3 seeks to overcome the data storage barriers of block chains.

Web 3.0

- Web 3.0 upholds the property of the ‘**semantic web,**’ which is powered by **Artificial Intelligence (AI)**.
- **Authentic and creative information:** The real point about the semantic web is its ability to recombine information available on different websites to generate new content and knowledge resources that are more authentic and creative.
- **Better search engines:** Followers of Web 3.0 claim that their version is endowed with robust capability on the data analytics front. This way, it is argued that Web 3.0 will create far better search engines.

How India can benefit?

- **Helping Craftsmen:** Web 3 platforms would enable handcraft enterprises to secure their innovations. Web 3-based instruction tools enable the rapid dissemination of grassroots innovations from master artisans to fellow members, which would improve the economic fortunes of craftsmen and artisan communities in north-east, western and peninsular India.
- **Exploiting community Data:** In recent times there has been the rapid rise of community data. The Atal Bhujal Yojana is an important source of data on groundwater utilization practices. However, this data is untapped, which can be exploited by Web 3.0.
- **Benefiting Rural community:** One constraint today is the inability of data analytics capabilities to catch up with the pace of data generation in rural areas. By providing incentives for decentralized analytics and tokenising them (as envisaged in Web 3), it is possible to draw upon the talent pool for the benefit of rural communities.

Topic 9. GOOGLE, META, APPLE ON THE RADAR IN EU’S ONLINE CONTENT RULES

Important for the subject : Science and Technology

Why in News?

The European Union (EU) has confirmed the names of 19 platforms that will be Important for the subject to its landmark online content rules.

News In Brief:

- The rules, notified under the Digital Services Act, aim at overhauling the EU’s social

media and e-commerce rules, and at tightly regulate the way big technology platforms moderate user content. Five subsidiaries of Google’s parent Alphabet, two Meta units, two Microsoft businesses, Apple’s AppStore, Twitter, and Ali-baba’s Ali-Express are among the entities that the EU has identified.

Key features of the Digital Services Act (DSA)

- **Faster removals and provisions to challenge:** Social media companies will have to add “new procedures for faster removal” of content deemed illegal or harmful. They will also have to explain to users how their content takedown policy works. The DSA allows users to challenge takedown decisions made by platforms, and to seek out-of-court settlements.
- **Bigger platforms have greater responsibility:** The legislation does not subscribe to a one-size fits all approach, and places increased accountability on the Big Tech companies. Under the DSA, ‘Very Large Online Platforms’ (VLOPs) and ‘Very Large Online Search Engines’ (VLOSEs) — that is, platforms having more than 45 million users in the EU, will have more stringent requirements.
- **Direct supervision by the European Commission:** These requirements and their enforcement will be centrally supervised by the European Commission itself — an important way to ensure that companies do not sidestep the legislation at the memberstate level.
- **More transparency on how algorithms work:** VLOPs and VLOSEs will face transparency measures and scrutiny of how their algorithms work, and will be required to conduct systemic risk analysis and reduction to drive accountability about the society impacts of their products. VLOPs must allow regulators to access their data to assess compliance and allow researchers to access their data to identify systemic risks of illegal or harmful content.
- **Clearer identifiers for ads and who’s paying for them:** Online platforms must ensure that users can easily identify advertisements and understand who presents or pays for the advertisement. They must not display personalized advertising directed towards minors or based on sensitive personal data.

India’s online laws similar to EU’s DSA

- In February 2021, India had notified extensive changes to its social media regulations in the form of the Information Technology Rules, 2021 (IT Rules) which placed significant

due-diligence requirements on large social media platforms such as Meta and Twitter.

- These included appointing key personnel to handle law enforcement requests and user grievances, enabling identification of the first originator of the information on its platform under certain conditions, and deploying technology-based measures on a best-effort basis to identify certain types of content.
- Social media companies have objected to some of the provisions in the IT Rules, and WhatsApp has filed a case against a requirement that requires it to trace the first originator of a message. One of the reasons that the platform may be required to trace the originator is that a user may share child sexual abuse material on its platform.
- However, WhatsApp has alleged that the requirement will dilute the encryption security on its platform and could compromise personal messages of millions of Indians.
- Earlier in 2022, with a view to making the Internet “open, safe and trusted, and accountable”, the Ministry of Electronics and IT notified amendments to IT intermediary Rules, 2021 aimed at protecting the rights of Digital Nagriks.

Key changes effected in the IT Rules 2021 are as under:

- Currently, intermediaries are only required to inform users about not uploading certain categories of harmful/unlawful content. These amendments impose a legal obligation on intermediaries to take reasonable efforts to prevent users from uploading such content. The new provision will ensure that the intermediary’s obligation is not a mere formality. The amendment requires intermediaries to respect the rights guaranteed to users under the of the Indian Constitution, therefore, including a reasonable expectation of due diligence, privacy and transparency.
- For effective communication of the rules and regulations of the intermediary, it is important that the communication is done in regional Indian languages as well.
- The grounds in rule 3(1)(b)(ii) have been rationalized by removing the words ‘defamatory’ and ‘libellous’. Whether any content is defamatory or libellous will be determined through judicial review.
- Some of the content categories in rule 3(1)(b) have been rephrased to deal particularly with misinformation, and content that could incite violence between different religious/caste groups.
- The amendment requires intermediaries to respect the rights guaranteed to users under the Constitution, including a reasonable expectation of due diligence, privacy and

transparency. The rules also have made it explicit for the intermediary to respect the rights accorded to the citizens of India under the **Articles 14, 19 and 21** of the Indian Constitution.

- Grievance Appellate Committee(s) will be established to allow users to appeal against the inaction of, or decisions taken by intermediaries on user complaints.
- They would have the authority to review and revoke content moderation decisions taken by large tech platforms. However, users will always have the right to approach courts for any remedy

Topic 10. MALARIA AND NOTIFIABLE DISEASES IN INDIA

Important for the subject : Science and Technology

Malaria is all set to become a notifiable disease across India despite there being a decline in the number of cases.

- At present, **malaria is a notifiable disease in 33 States and UTs in India.** The latest move is in line with **India's vision to be malaria-free by 2027** and to **eliminate the disease by 2030.**
- **India was the only high-burden, high-impact country** in the **Southeast Asian region to experience a decline** in malaria cases in 2020 as compared to 2019.
- India experienced an 85.1% decrease in malaria cases and an 83.36% decrease in deaths during 2015-2022.

Notifiable diseases in India

- Notifiable diseases are **those diseases that are required by law to be reported to government authorities.**
- This is in line with the World Health Organization's International Health Regulations, 1969 that mandate disease reporting to the organization to help its global surveillance and advisory role. The collation of information helps the government authorities to monitor the disease and provides early warning of possible outbreaks.
- **Declaring diseases as legally notifiable by doctors and health professionals facilitates timely interventions to control the spread of highly infectious diseases.** The responsibility of notifying such diseases and the implementation lies with the State government.

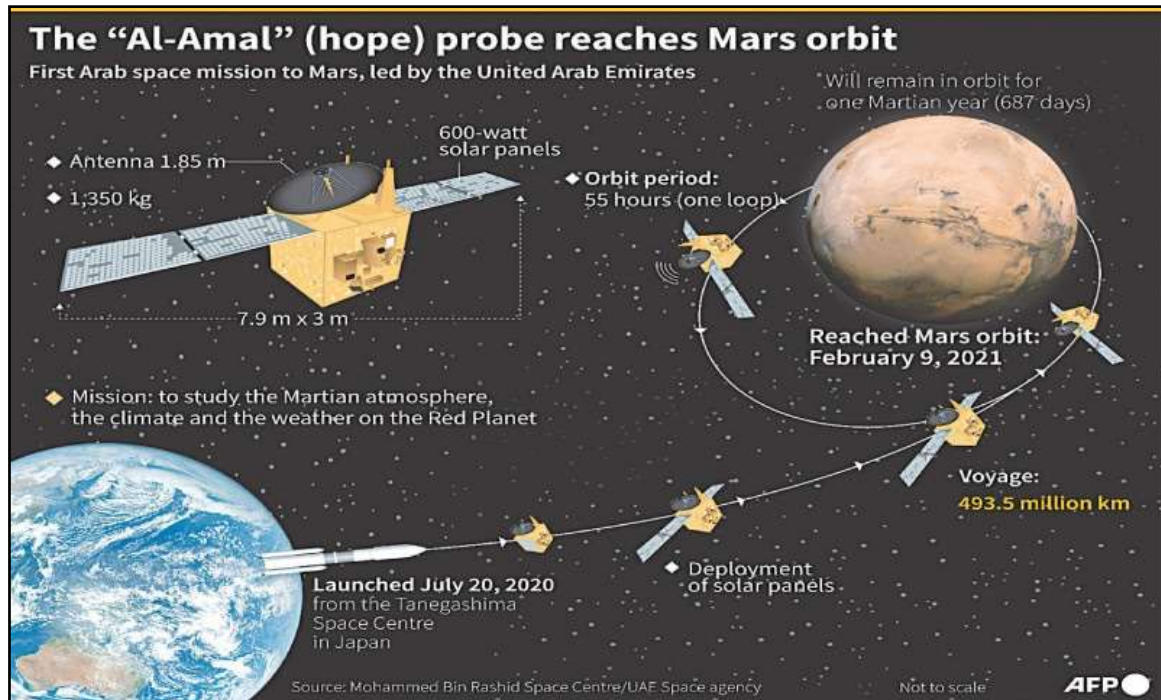
- The government has declared several diseases as notifiable diseases including diseases like **cholera, encephalitis, leprosy, meningitis, plague, tuberculosis, AIDS, hepatitis, measles, yellow fever, dengue, etc.**

About Malaria

- Malaria is a serious **mosquito-borne infectious disease caused by various species of parasitic protozoan** microorganisms called
- The malarial parasite was discovered by Dr. Alphonse Laveran, a military doctor, in 1880. Malaria is **transmitted by an infected female Anopheles mosquito.**
- The plasmodium parasites multiply and develop **inside the liver cells and red blood cells of human beings.**
- **Symptoms:** Fever, chills, and headaches are considered mild symptoms, while fatigue, convulsions, and breathing difficulties are among the severe symptoms.
- Effective Vector Control is a vital component for the elimination of malaria. Insecticide-treated nets and indoor residual spraying (IRS) are also effective to reduce the transmission of the disease.
- **April 25 of every year has been commemorated as World Malaria Day since 2007.**

Topic 11. UAE'S HOPE SPACE PROBE OFFERS NEVER BEFORE VIEW OF MARS MOON

Important for the subject : Science and Technology



A new map of Mars shows the Red Planet in stunning detail, revealing a wealth of fascinating geological features as seen from orbit. The high-resolution map could help scientists answer a number of pressing questions about Mars including how it came to be a dry, arid, and barren landscape despite once being abundant with liquid water.

The Martian map was created by a team of scientists led by New York University Abu Dhabi (NYUAD) and the United Arab Emirates (UAE) Center for Space Science (opens in new tab). The researchers used data collected from orbit around Mars by the Emirates Mars Mission (EMM), also known as Hope or Al-Amal.

HOPE

- Unmanned craft, called Amal, Arabic for Hope, had reached the end of its nearly seven-month, 300-million-mile journey and had begun circling the red planet.
- It is a Mars orbiter spacecraft of the United Arab Emirates which is Arab world’s first inter-planetary mission.

- The mission is officially named the Emirates Mars Mission (EMM) and the orbiter has been named Hope or 'Al Amal'. The mission has a life of one Martian year (equivalent to 2 earth year).

The Probe carries three scientific instruments:

Emirates exploration Imager (EXI): A high-resolution camera.

- **Emirates Mars Ultraviolet Spectrometer (EMUS):** A far-UV imaging spectrograph.
- **Emirates Mars Infra Red Spectrometer (EMIRS):** It will examine temperature profiles, ice, water vapor and dust in the atmosphere of Mars.

Aim of mission

- Climate dynamics and global weather map of Mars by studying the lower atmosphere of Mars Weather of Mars affects the escape of hydrogen and oxygen, by correlating conditions in the lower and upper atmosphere.
- The presence and variability of hydrogen and oxygen in the upper atmosphere, and why Mars is losing these gases to space.

Significance:

- 'Hope' mission is not only important for UAE, but also for the whole of Arab world, as it is the **Arab world's first interplanetary mission.**

Other Missions to Mars :

- **China's Change Project USA's Perseverance India Mangalyaan**

Topic 12. WHAT IS LOCKBIT RANSOMWARE AND WHY IS IT TARGETING MACOS?

Important for the subject : Science and technology

Cyber criminals have developed **new ransomware encryptors designed to target macOS devices**, making this the **first major ransomware operation** to specifically target Apple computers.

- The new encryptors target both older Macs and newer ones running on Apple Silicon.

Earlier in January, the Lock Bit gang was reportedly behind a cyber-attack on U.K. postal services.

About Lock Bit ransomware:

- First reported in September 2019 and also known as “**abcd**” virus. Due to the file extension used when encrypting victim’s files.
- The virus is categorized as a “**crypto virus**” due to its requests for payment in crypto currency to decrypt the files on the victim’s device.
- The **Lock Bit ransomware** is designed to infiltrate victims’ systems and encrypt important files.
- It targets the enterprises and organizations in the **U.S., China, India, Ukraine, and Indonesia**. Attacks have also been recorded throughout **Europe**, including in France, Germany, and the U.K.

How do it works?

- It works as a **self-spreading malware**, not requiring additional instructions **once it has successfully infiltrated a single device** with access to an organizational intranet.
- It also known to **hide executable encryption files by disguising them in the PNG format**, thereby avoiding detection by system defences.
- It **disables security programs** and places an **encryption lock on all system files**, which can only be unlocked via a **custom key created by the LockBit gang**.

About LockBit ransomware gang:

- The group behind this is known as the **LockBit gang**. It is considered the **most prolific ransomware group ever**.
- It operates on the **ransomware-as-a-service (Raas) model** and comes from a line of extortion cyberattacks.

How to protect systems against the LockBit ransomware?

- The use of strong passwords, with strong variations of special characters which are not easy to guess along with multi-factor authentication should be implemented.
- This ensures the use of brute force will not be enough to compromise systems. Organizations can also undertake training exercises to educate employees on the use of

phishing attacks and their identification.

- Old and unused user accounts should be deactivated and closed as they can become weak links in the security apparatus.

Topic 13. INDIA CONDUCTS SUCCESSFUL TRIALS OF BMD INTERCEPTOR MISSILE

Important for the subject : Science and Technology

Recently, The DRDO and Indian Navy successfully conducted a maiden flight **trial of sea-based endo-atmospheric interceptor missile** off the coast of Odisha. **India entered an elite club of nations with the capability to fire a Ballistic Missile Defense (BMD) interceptor from a naval platform.**

Prior to this, DRDO has successfully demonstrated land-based ballistic missile defence system with capability to neutralize ballistic missile threats, emerging from adversaries.

India's Ballistic Missile Defence Program:

- India launched the BMD program after Kargil war in 1999 to counter the enemy nation's widening spectrum of ballistic missiles that usually delivered both conventional and nuclear warheads.

Two-tires of BMD system

Prithvi Air Defence missile:

- It was originally tested in 2006 and is capable of intercepting and destroying missiles at **exo-atmospheric altitudes ranging from 50 to 180 kilometres.**
- The Pradyumna interceptor has already replaced the Prithvi Air Defence BMD. Exo-atmospheric missiles are capable of completing missions in the Earth's upper atmosphere.

Advanced Air Defence Missile:

- The second layer is Advanced Air Defence (AAD) Missile for lower altitude interception.
- It was first tested in 2007 and designed to knock down hostile missiles in the **endoatmosphere at altitudes of 15-40 KM.** The endo-atmospheric missiles are the ones that operate within the earth's atmosphere that covers an altitude below 100 KM.

Topic 14. ISRO LAUNCHES PSLV-C55 WITH TWO SINGAPORE SATELLITES

Important for the subject : Science and technology

The Indian Space Research Organization's Polar Satellite Launch Vehicle (PSLV-C55) lifted off from the Satish Dhawan Space Centre in Sriharikota on Saturday, carrying two **Singapore** spacecraft, **TeLEOS-2** as primary and **Lumelite-4** as co-passenger.

About the Mission

- The mission was a dedicated commercial PSLV flight of New Space India Limited (NSIL) for a Singapore-based multinational satellite customer.
- The PSLV-C55 was carrying two Singapore satellites: **TeLEOS-2, the primary satellite, and Lumelite-4, the secondary satellite.**
- **TeLEOS-2**, which has a **Synthetic Aperture Radar payload**, was developed in collaboration between DSTA and ST Engineering to **fulfil the satellite imagery needs of multiple Singapore agencies.**
- **Lumelite-4** is a **technology demonstration nano-satellite** built by the Agency for Science, Technology, and Research's Institute for Infocomm Research (I2R) and the National University of Singapore's Satellite Technology and Research Centre (STAR).
- Its goal is to improve **Singapore's e-navigation maritime safety while also benefiting the worldwide shipping community.**
- The mission is PSLV's **57th flight** and the **16th using the PSLV Core Alone configuration (PSLV-CA).**

PSLV Orbital Experimental Module (POEM):

- The mission also **involves in-orbit scientific experiments using the spent PS4 stage as an orbital platform, which is the third time that PS4 will be used after satellite separations as a platform for experiments.**
- Non-separable payloads will be mounted on MSA (multi-satellite adapter), and the power will be provided to payloads and avionic packages based on their requirements.

Topic 15. MICROBES AT THE TOP OF THE WORLD

Important for the subject : Science and Technology

An article, **Genetic analysis of the frozen microbiome at 7,900 meters above sea level on the South Col of Sagarmatha (Mount Everest)**, by Dr. N.B. Dragone and others in journal Arctic, Antarctic, and Alpine Research examines the human microbiota on the inhospitable slopes of Mount Everest.

- They were able to collect **microbial communities** in sediment samples left by human climbers on the **South Col of Mount Everest**, 7,900 meters above sea level (msl).
- The **South Col** is the **ridge** which **separates Mt. Everest from Lhotse** — the fourth highest mountain on earth.
- The **two peaks** are only three kilometers apart. At **7,900 msl**, the **South Col** is rather inhospitable — a heat wave in July 2022 led to a record high temperature of minus 1.4 degree Celsius.
- A few species of moss and a jumping spider that feeds on frozen insects carried by the wind are found there.
- 9/15 Using sophisticated methods such as **16S** and **18S rRNA sequencing**, the **microbe hunters were able to identify the bacteria and other microorganisms found on the South Col**.
- **16s rRNA** is a component of the **30S subunit in prokaryotic ribosomes** while **18s rRNA** is a component of the **40S subunit in eukaryotic ribosomes**. **16S ribosomal RNA (rRNA) sequencing** is an **amplicon sequencing technique** used to **identify and compare species of bacteria present within a given sample**.
- **16S rRNA gene sequencing** is used to **study phylogeny and taxonomy of samples from complex microbiomes** or environments that are difficult or impossible to study.
- Microbes like *modestobacter altitudinis* and the **fungus, naganishia**, which are known to be **UV-resistant survivors** are found there.

Utilization of microbes:

Enzymes, chemicals, and other bioactive molecules

- Citric acid fungus *Aspergillus niger* *Acetobacter acetii* (an acetic acid bacteria) *Clostridium butylicum* (a butyric acid-producing bacterium) *Lactobacillus acidophilus* (a bacterium).

For the commercial manufacturing of ethanol, yeast (*Saccharomyces cerevisiae*) is utilised.

Milk to Curd

- **Lactobacillus** and other microorganisms known as lactic acid bacteria (LAB) thrive in milk and convert it to curd.

Fermentation

- **Yeast** converts sugar into alcohol. Fermentation is the process of converting sugar into alcohol. In 1857, Louis Pasteur discovered fermentation. **baker's yeast** is used to ferment the dough required to make bread (*Saccharomyces cerevisiae*).

Fermented Drinks

- ***Saccharomyces cerevisiae***, often known as **brewer's yeast**, is used for fermenting malted cereals and fruit juices to make ethanol for this purpose.

Sewage treatment microbes

- The **microorganisms** devour the majority of the organic materials in the wastewater as they grow. This greatly reduces the **effluent's BOD (biochemical oxygen demand)**.

Microbes in biogas generation

- Biogas is a gas combination (predominantly methane) created by microbial activity that can be used as fuel.
- **Methanogens** are bacteria that produce **Methanobacterium** is one such frequent bacterium.
- **Bio-control agents based on microbes *Bacillus thuringiensis*** is an example of a **microbial bio-control agent** that can be introduced to **control butterfly caterpillars** (often written as Bt). The **fungus *Trichoderma*** is being developed as a biological control for the treatment of plant disease.
- **Microbes as bio-fertilizers *Azospirillum*, mycorrhiza and *Azotobacter*** can improve the **soil's nitrogen content by fixing atmospheric nitrogen** while growing freely in the soil.
- Many **cyanobacteria**, including ***Anabaena*, *Nostoc*, *Oscillatoria*, etc.**, are **autotrophic microbes** that can **fix atmospheric nitrogen**. They are found in both aquatic and

terrestrial habitats. **Cyanobacteria** are a significant bio-fertilizer in **paddy fields**.

Preservatives About Mount Everest:

- Named **Mount Sagarmatha** in Nepal region. Nepal's eminent historian, late **Baburam Acharya**, gave it the Nepali name, **sagarmatha**, in the **1960s**. **Kangchenjunga peak:**
- In **1847**, **Andrew Waugh, British Surveyor General of India**, found a peak in the **eastern end of the Himalayas** which was **higher than the Kangchenjunga** — considered as the **highest peak in the world at that time**.
- His predecessor, **Sir George Everest**, was interested in high-altitude hills and had deputed Waugh to take charge. In true colonial spirit, **Waugh called it the Mount Everest**.
- The **Indian mathematician and surveyor, RadhanathSikdar**, was an able mathematician. He was the **first person to show that Mount Everest (then known as peak XV) was the world's highest peak**.
- **George Everest** had appointed **Sikdar** to the post of 'Computer' in the Survey of India in 1831.
- In **1852**, **Sikdar**, with the help of a special device, **recorded the height of 'Peak 15' at 8,839 metres**. However, it was officially announced in **March 1856**.

Topic 16. CLOSE TO 4,000 PAINTED STORKS NESTING IN TWO A.P. VILLAGES

Important for the subject : Environment

One of the largest flock of painted storks (*Mycteria leucocephala*), approximately 4,000 birds, have made tall trees in Veepapuram and Venkatapuram villages in Andhra Pradesh.

About Painted Storks

- The **Painted Stork is a large wading bird in the stork family**. Their distinctive pink tertial (flight) feathers of the wing are pink and give them their name. The painted storks are usually **seen in the freshwater wetlands and occasionally in the coastal regions**.
- They are found in **Pakistan, India, Sri Lanka, Myanmar, Malaysia, Thailand and Vietnam**.
- The **International Union for Conservation of Nature (IUCN)** had categorized and evaluated these **stork species and had listed them as 'Near Threatened'**. These storks

feed in groups, wading in shallow waters and avoiding deeper waters. They feed on small fish, frogs and reptiles.

- The breeding season extends from July to October in north India and November to March in south India. Though the population in India is considered secure, the **painted stork are near threatened in other countries due to poaching.**

17. NICOBAR PROJECT VIOLATES TRIBAL RIGHTS: ST PANEL

Important for the subject : Environment



The NCST has cited alleged violations under the Forest Rights Act (FRA), 2006 with respect to the forest clearance granted for the Great Nicobar Island (GNI) Project. The FRA provides for the recognition of wider community rights over forest land.

The legislation allows forest communities the right to control and manage the use of the forest land over which they hold titles and their consent is mandatory for diverting it.

Violations under the Forest Rights Act (FRA), 2006

- According to **Rule of Forest Conservation Rules-2017 (FCR)**, any diversion of forest land would first require the District Collector to recognise and vest rights to locals

under the FRA.

- Only then do the rules permit authorities to seek consent of the now-rights holding gram panchayats for the diversion of this land. These provisions were envisioned to give primacy to rights of indigenous forest-dwelling communities.
- However, the district administration did not receive or process a single claim over forest land under the FRA. Instead, a special Gram Sabha meeting was called and a resolution was purportedly passed. The resolution consented to diversion of the forest land adjacent to their villages for the purpose of the project.

NCST had also opposed the Forest (Conservation) Rules (FCR) 2022

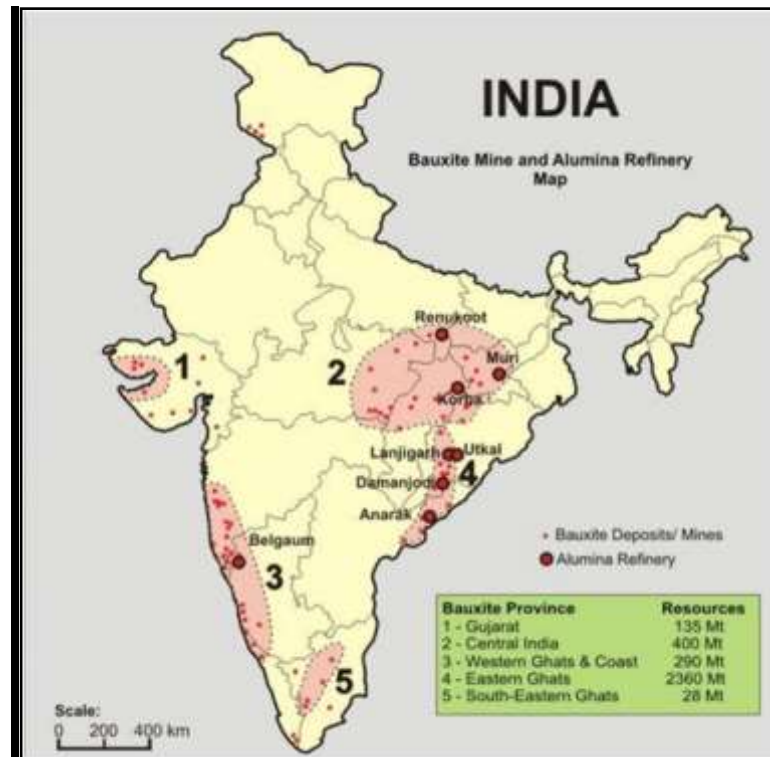
- FCR 2022 make a provision for private parties to cultivate plantations and sell them as land to companies who need to meet compensatory forestation targets.
- The rules allow private developers to clear forests without first seeking the permission of the forest dwellers. NCST opposed the FCR-2022, which had done away with the consent clause altogether.

Nil implementation of FRA

- The Andaman and Nicobar administration had reported nil implementation of FRA. The justification of the administration has been that the islands have the Andaman and Nicobar Islands (Protection of Aboriginal Tribes) Act, 1956 (PAT56).
- This act already provides for the full protection of the interests of forest-dwelling Scheduled Tribes.
- So, there is no claim as such for settlement under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006.
- NCST claimed that, under the PAT56, a significant portion of the forest land in Great Nicobar has been marked as a Tribal Reserve.
- Over these reserves, local tribespeople have been given rights to use and collect resources as and when needed for their daily sustenance.
- However, the power of notification and de-notification of the land as a Tribal Reserve is solely with the administrator of the islands under PAT56.

Topic 18. BAUXITE MINING IN JHARKHAND IS IMPACTING SOIL FERTILITY, PEOPLE'S HEALTH

Important for the subject : Environment



Bauxite mining in Gumla district of Jharkhand is making the land barren and affecting the health of the people. Mining activities say that companies are **not following norms** that **include backfilling of fields** after the conclusion of mining, which is affecting their livelihood.

Obtaining leases for mining on forest land is a complicated process and while **procuring leases for mining on farming land is comparatively easier**. The **forest department** is responsible for monitoring the loss of forest land due to mining and preparing an action plan. However, only wildlife and vegetation come under its ambit. **Monitoring the impact on farmers and tribal communities does not come under its purview**.

Bauxite:

- Bauxite is an important ore that is **used for making aluminium**. It is an **oxide of**

aluminium.

- Bauxite **appears dull in luster** and is reddish-brown, white, or tan in color. It is **not a specific mineral** but a rock consisting mainly of hydrated aluminium oxides.
- The deposits of Bauxite are **mainly associated with laterites and** occur as capping on hills and plateaus, except in coastal areas of Gujarat and Goa.
- Bauxite is primarily used **to produce alumina through the Bayer process**. Australia is the largest producer of bauxite, followed by China.

Bauxite reserves in India

- There are abundant bauxite reserves in the country. However since they are **located in heavily forested areas, inhabited by indigenous people**; mining has been unable to start in these regions.
- By States, **Odisha alone accounts for 53% of country's resources** of bauxite.

The ranking of states in terms of bauxite resources is as following

- Odisha (53%)
- Andhra Pradesh (16%)
- Gujarat (8%)
- Jharkhand (5%)
- Madhya Pradesh, Maharashtra and Chhattisgarh (4% each).

Topic 19. POLLUTION CONTROL BOARDS AREN'T UNDERFUNDED BUT INVESTING THEIR SURPLUS INTO FIXED DEPOSITS

Important for the subject : Environment

An amount of Rs 2,893 crore found to be invested in fixed deposits by 10 pollution regulators. A research paper, **has raised questions** as to whether State Pollution Control Boards and Pollution Control Committees (SPCBs/PCCs) in India are effectively fulfilling their mandate to control pollution.

- It found that 10 SPCBs/PCCs, all in the **Indo-Gangetic Plain (IGP)**, had **invested their annual substantial surplus in the form of short, medium-term fixed deposits** to the tune of Rs 2,893 crore as of March 31, 2021. The amount should ideally have been invested in manpower, infrastructure and equipment.

- A majority of the Boards examined were found to **generate nearly half of their revenues by issuing polluting industries no objection certificates** and granting consent to establish and operate.
- This is because **central government funding** while regular, is **inadequate** as it is provided only for existing centrally sponsored schemes.
- On the other hand, **consistent funding from state governments is largely nonexistent**. The authors found that no financial support was provided by state governments to their respective SPCBs/PCCs in all but two states.
- Most of the Boards studied **struggled to spend the entirety of the surplus** they generated for each of the three years. **Pay and allowances for staff comprise over half of SPCB/PCC expenditure**, with some skewing upwards of 80 per cent.
- Despite the poor state of infrastructure in many states, **spending on new infrastructure including lab facilities is low, with some exceptions**. Spending on research, development and studies comprise a tiny fraction of overall expenditure across the board.

All this led to the surplus being invested into fixed deposits.

Topic 20. FOREST FIRES NOW POSE A THREAT TO THE VERY SURVIVAL OF UTTARAKHAND'S UNIQUE BIODIVERSITY

Important for the subject : Environment

Forest fire season in Uttarakhand coincides with flowering & breeding months of several vulnerable species, many of them native to Himalayas.

- Forest fires are becoming more frequent and fierce in Uttarakhand. Such **regular burnings can be catastrophic for the state as well as the rich biodiversity** it harbours.
- With 7,000 species of plants, Uttarakhand contributes 31 per cent of the country's floral diversity. As many as **119 flowering plants are endemic to the state**.
- The impact of recurrent forest fires in Uttarakhand is therefore not limited to the direct loss of trees and wildlife, their **displacement and subsequent colonisation of unwanted species**. By **destroying the leaves and foliage**, a forest fire can significantly **reduce the photosynthetic activity of surviving trees** and thereby affect their growth.
- It can also **damage the seed bank**, both above and below the ground, and **wipe out the seedlings and saplings growing on the forest floor**. Species that are sparsely distributed

and have small or patchy populations suffer the worst impacts as they lose their habitat, territories, shelter and food.

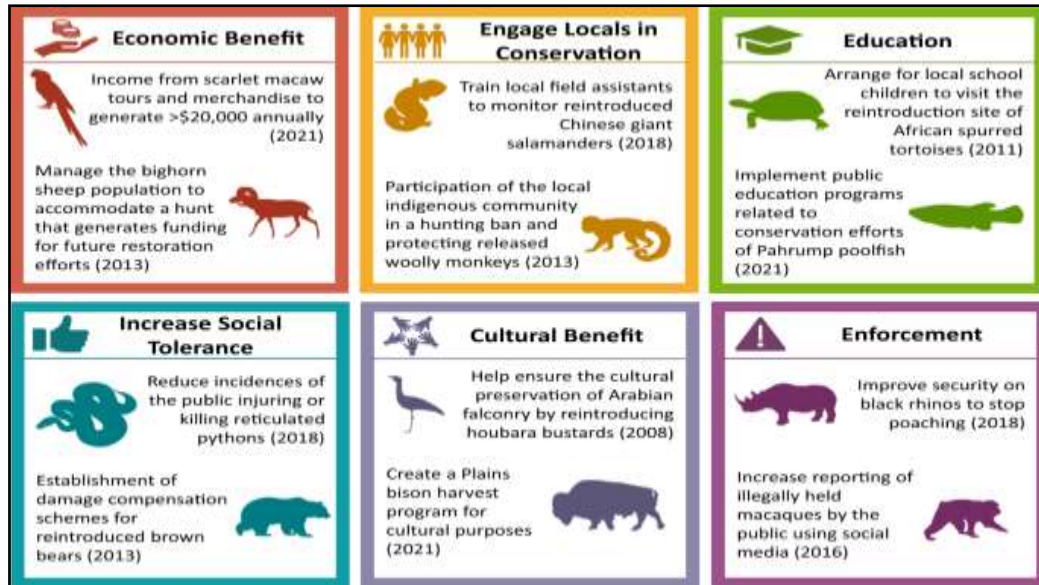
- The **loss of keystone organisms** in forest ecosystems, such as invertebrates, pollinators, and decomposers, can significantly slow the recovery rate of the forest.

Endemic Species:

- **Taxusbaccata L**, a **conifer native to the Himalayas**. The plant, known for **anticancerous properties**, starts flowering from March, when the peak fire season in Uttarakhand typically begins. A massive forest fire during the flowering season can severely impede propagation of the species.
- Fruiting in **Asparagus adscendensRoxb**, a native plant of the Himalayas **used for vigour and vitality**, also occurs in March. A forest fire can damage its mature fruits and hinder fruiting. Researchers have already recorded scarce germination of the plant because of forest fires.
- **B aristata**, whose roots, stem and leaves are used in the **treatment of various ailments**, is already at risk from overexploitation.
- **Stephaniaglabra** is another medicinal plant whose **tuber** is used in the treatment of **asthma, tuberculosis, dysentery, hyperglycemia, cancer, fever**, intestinal complaints, sleep disturbances and inflammation.

Topic 21. WILDLIFE TRANSLOCATION PROGRAMMES BENEFIT IF THEY INCORPORATE HUMAN DIMENSIONS

Important for the subject : Environment



Efforts to translocate wildlife benefit if human-related factors, biological and environmental considerations are incorporated, according to a new study by the University of California-Berkeley (UCB).

- Wildlife translocation is the intentional movement of animals for conservation purposes. It has been used as a technique to mitigate the loss and depletion of endangered species.
- **Success of wildlife translocations hinges is coexistence** with people. Human dimensions are considered integral to the design, implementation and evaluation of wildlife translocations according to the IUCN Guidelines for Reintroductions and Other Translocations.
- However, despite the recognised importance of human dimensions, these **factors are still largely missing from many conservation initiatives**, according to the UCB study.
- The researchers synthesised information from case studies reported in the IUCN Global Re-Introduction Perspective Series to identify relationships between the inclusion of human dimension objectives in wildlife translocation efforts and program outcomes.
- 5/16They **analyzed 305 case studies** of wildlife translocations from seven IUCN reports published between 2008 and 2021. Of the 305 case studies, 127 case studies (42 per cent) included human dimension objectives when planning their translocation.

- The study found that **translocation efforts that included human dimension objectives** were significantly **more likely to have a positive outcome** than the translocation efforts that did not include human dimension objectives.
- Of the **six key strategies** the study identified for including human dimension objectives, **education was the most common, followed by engaging locals, providing economic benefits, increasing social tolerance, enforcing regulations and supplying cultural benefits.**

Topic 22. BLUE WASHING

Important for the subject : Environment

Report flags how corporate have wormed their way into global food governance A new research has highlighted how **corporate capture of global food governance is increasingly taking place in more visible ways.** There has been a growing presence of firms in governance and spaces, staking claims to be legitimate actors, for example, **through public-private partnerships and multistake holder roundtables.**

- When corporations are involved in public governance, they can also **justify involvement by reframing the concept of public interest in terms that benefit corporations and large private businesses** rather than people and the environment, noted Who's tipping the scales report, released by the International Panel of Experts on Sustainable Food Systems (IPES).
- The **Covid-19 pandemic, coupled with Russia's invasion of Ukraine** and food inflation, **aggravated the issue of corporate involvement.** Following these crises, governments and multilateral agencies have been facing fund crunches.
- They control the system **“through lobbying behind the scenes, political and institutional donations, market power, shaping trade and investment rules, shaping research and innovation, as well as influencing other structural aspects of global food systems.”**
- The **FAO's partnership with CropLife**, a major pesticide lobby organization that has many large agribusiness firms as members, is one of the more recent examples of this type of arrangement, the document pointed out.
- **“While such partnerships allow firms to ‘blue-wash’ or ‘social-wash’ their reputations via closer links with the UN** and other intergovernmental bodies, critics have charged that these kinds of partnerships between private sector actors and international

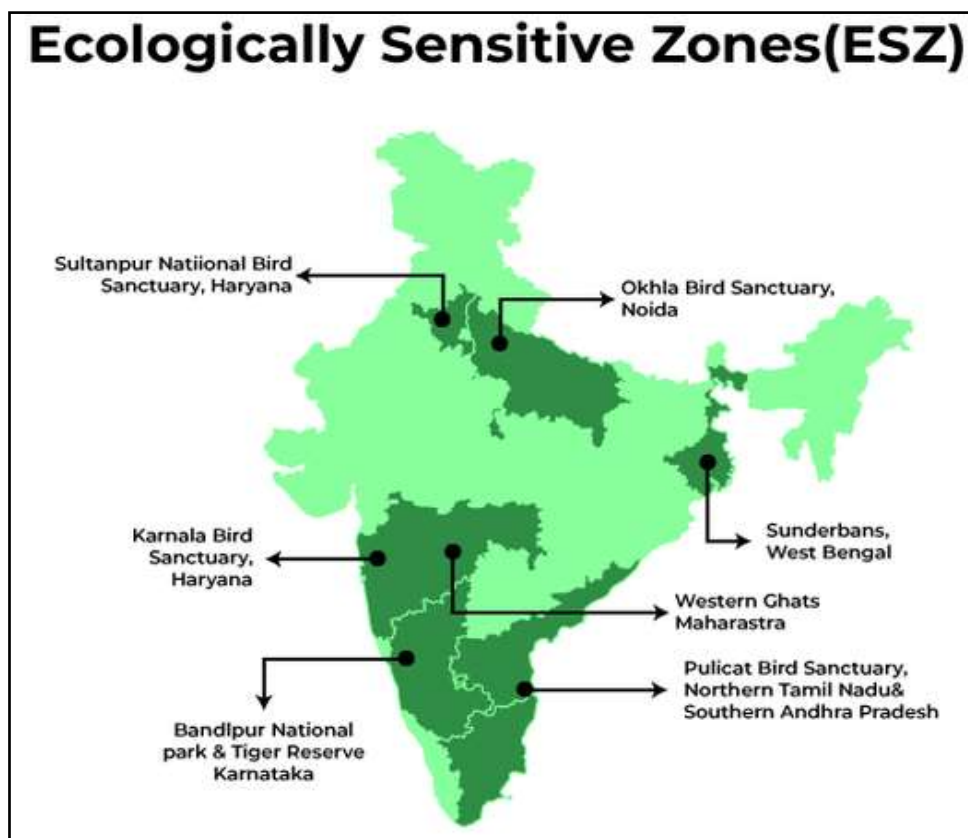
governance bodies also create conflicts of interest,” the IPES report said.

Bluewashing

- Bluewashing is term used to describe deceptive marketing that overstates a company’s commitment to responsible social practices.
- It can be used interchangeably with the term green washing but has a greater focus on economic and community factors. Alternatively, it could be phrased as a way that companies hide the social damage that their policies have caused.
- Active disinformation is a tool that companies use to make their goods or services more attractive to their consumers and shareholders.

Topic 23. SC MODIFIES ORDER ON ECO-SENSITIVE ZONE AROUND NATIONAL PARKS, SANCTUARIES

Important for the subject: Environment



The Supreme Court Wednesday modified its 2022 order mandating a **minimum 1- km eco-sensitive zone around national parks or wildlife sanctuaries**, saying it would have

prevented the government from building roads and other important infrastructure in those areas.

- With the June 3, 2022 order sparking concerns about human habitations falling within the proposed ESZs, the Centre had approached the court seeking modification of some of the directions.
- On Wednesday, a bench of Justices B R Gavai, Vikram Nath and Sanjay Karol said the 2022 order will not be applicable to ESZs in respect to which draft and final notifications have been issued by the Ministry of Environment, Forests and Climate Change, and where proposals for such notifications have been received by the ministry.
- It will also not be applicable where the national parks and sanctuaries are located on inter-state borders or share common boundaries.
- But it underlined that no mining would be allowed, either within national parks and sanctuaries or in a 1-km radius.

Why new order?

- As per the previous order t no permanent structure would be permitted to come up for whatsoever purpose in the aforesaid ESZs. Hundreds of villages are situated within the ESZs in the country. If no permanent construction is to be permitted for any purpose, a villager who is desirous to reconstruct his house would not be permitted. Similarly, if there is an extension in their family and some additional construction is required for accommodating the enlarged family, the same would also not be permitted. Similarly, if the Government decides to construct schools, dispensaries, anganwadis, village stores, water tanks and other basic structures for improvement of the life of the villagers, the same would also not be permitted. The effect of the order will be to prevent the State or the Central Government from constructing roads and provide other facilities to the villagers. MoEFCC provides financial assistance to the States under the Centrally Sponsored Scheme-Integrated Development of Wildlife Habitats, which includes assistance for eco-development activities. These activities often involve construction of small structures which are permanent in nature in areas including ESZs.”

Integrated Development of Wildlife Habitats’ (IDWH)

- It is an on-going Centrally Sponsored Scheme which has been made operational by

adding more components and activities to the erstwhile Centrally Sponsored Scheme – “Assistance for the Development of National Parks and Sanctuaries” during the 11th Plan Period. Under IDWH, the financial assistance is provided to State/UT Governments for protection and conservation of wildlife and its habitats in Protected Areas (PAs) as well as outside PAs and also for the recovery programmes of the critically endangered species.

Components of the scheme

- Support to Protected Areas (National Parks, Wildlife Sanctuaries, Conservation Reserves and Community Reserves) Protection of Wildlife Outside Protected Areas, Recovery program for saving critically endangered species and habitats, Recovery program for saving critically endangered species, So far, 22 species have been identified under the recovery programme. These are the Snow Leopard, Bustard (including Floricans), Dolphin, Hangul, NilgiriTahr, Marine Turtles, Dugongs, Edible Nest Swiftlet, Asian Wild Buffalo, Nicobar Megapode, Manipur Brow-antlered Deer, Vultures, Malabar Civet, Indian Rhinoceros, Asiatic Lion, Swamp Deer, Jerdon’s Courser, the Northern River Terrapin, Clouded Leopard, Arabian Sea Humpback Whale, Red Panda and Caracal.

Eco-Sensitive Zones

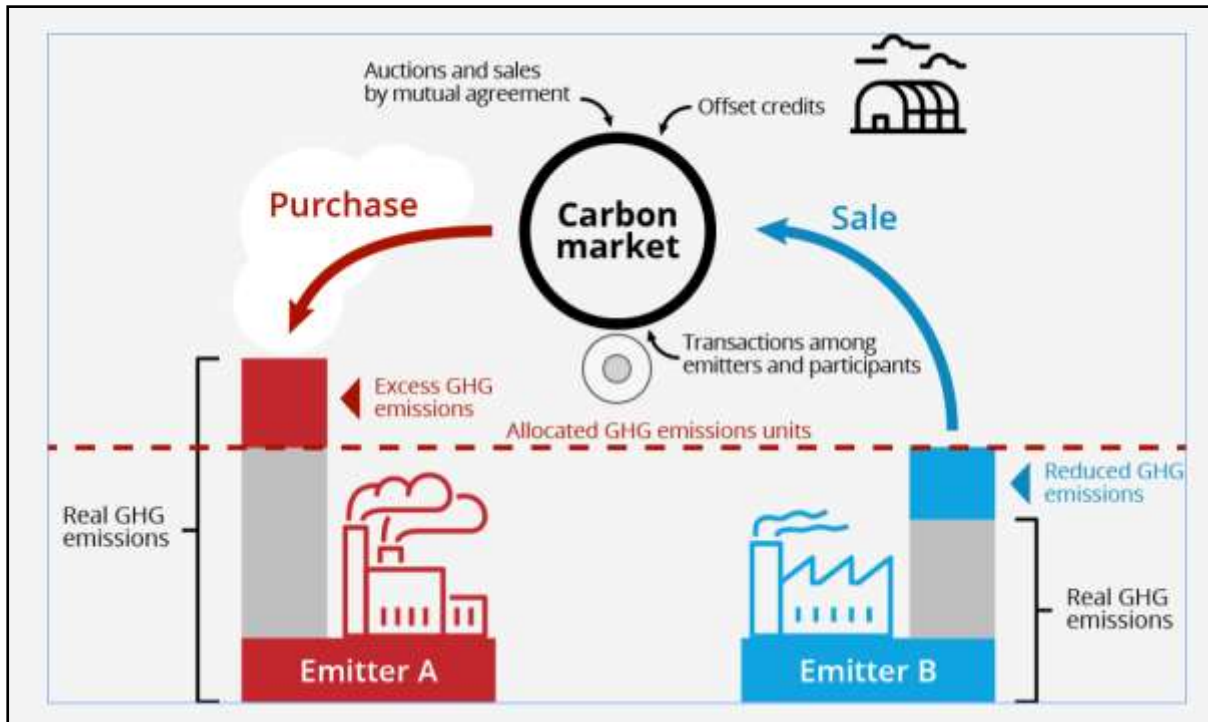
- Eco-Sensitive Zones (ESZs) are also known as **Ecologically Fragile Areas (EFAs)**. Eco-sensitive zones are areas notified by the MoEFCC around Protected Areas, National Parks and Wildlife Sanctuaries.
- The purpose of declaring ESZs is **to create some kind of “shock absorbers”** to the protected areas by regulating and managing the activities around such areas.
- As per the **National Board for Wildlife NBWL, the delineation of eco-sensitive zones have to be site-specific**, and the activities should be regulative in nature and not prohibitive unless required.
- The basic aim is to regulate certain activities around National Parks and Wildlife Sanctuaries to minimize the negative impacts of such activities on the fragile ecosystem encompassing the protected areas.
- They also act as a transition zone from areas of high protection to areas involving lesser protection.

Implementation of Ecologically sensitive zones (ESZs)

- According to the Wildlife Conservation Strategy of 2002 areas within 10 km of the boundaries of protected areas must be notified as **ecologically fragile zones under Section 3(2) (v) of the Environment Protection Act 1986 and its Rules 5(viii) and (x)**.
- The MoEFCC was entrusted to undertake measures to protect the environment by regulating and prohibiting industries, operations and processes.
- However, Rule 5(1) (vi) had provisions for permitting environmentally compatible land-use in areas around protected areas.
- Further, the **National Board for Wildlife (NBWL) in 2005** decided to define sitespecific ESZs to regulate specific activities instead of a blanket ban on them. Thus, the MoEFCC directed the States and UTs to propose ESZs.
- As per the guidelines of the MoEFCC, in order to declare areas as ESZs, a committee consisting of the Wildlife Warden, an ecologist, and an official from the local government was to determine the extent of each ESZ.
- The **Chief Wildlife Warden** was entrusted with the task of preparing a list of those activities that are to be prohibited or restricted or that can be allowed with additional safeguards.
- Later, the State government must submit this list along with the geographical description, biodiversity values, the rights of local communities, their economic potential and implications for their livelihoods, as a proposal to the MoEFCC for notification.
- Further, the State government is mandated to come up with a draft Zonal Master Plan within two years of notification.

Topic 24. EUROPEAN UNION MEMBERS APPROVE CARBON MARKET SCHEME, OTHER CLIMATE LAWS

Important for the subject : Environment



Why in News?

EU countries have given the final sign-off for a series of new climate change-related laws, which seek to create financial incentives for keeping emissions in check, and penalties for failing to do so. The 27 member states in the EU approved a revamp to the bloc's so-called carbon market, which is set to make it more costly to pollute for businesses in Europe.

This in turn led to sharpening of the main tool the EU has, to discourage carbon dioxide emissions in the industrial sector.

The changes to the EU's Emissions Trading System (EU ETS), more commonly called the bloc's **carbon market**, are one of five new laws given final approval after being proposed by the European Commission and after a favorable vote at the European Parliament.

What is the carbon market?

- Carbon Markets are essentially a tool for putting a price on carbon emissions and establishing trading systems where carbon credits or allowances can be bought and sold.
- As per the UN a carbon credit is a kind of tradable permit that equals one tonne of carbon dioxide removed, reduced or sequestered from the atmosphere. Carbon allowances or caps are determined by countries or governments according to their emission reduction targets.

Expected Consequences of the Proposed Changes

- The changes will set more stringent targets and tougher penalties as time passes. The new rules increase the overall ambition of emissions reductions by 2030 in the sectors covered by the EU ETS to 62% compared to 2005 levels. The free permits granted to companies for lower levels of emissions will be gradually phased out, by 2034 for heavy industries and by 2026 for the aviation sector, for instance.

Concerns Raised Against the Proposed Changes

- There had been some resistance to the changes within the bloc, which are roughly two years in the making. Only 23 of 27 EU members voted in favor; Poland and Hungary opposed it, Belgium and Bulgaria abstained. Critics like Poland had argued that the targets were too ambitious and would place an unfair strain on industry. **Some EU policies and laws require unanimous approval from member states, but for most others a qualified majority vote will be sufficient.**

Other Key Alterations Approved by the EU

- The changes to the ETS discussed above are part of the EU's "**Fit for 55**" package of climate plans, which is a reference to its goal of reducing carbon emissions by **55% by 2030 compared with a 1990 benchmark**. Four more alterations were also approved.
- A plan to incorporate parts of the shipping industry into the ETS was approved. It means that they too will need to buy permits to cover their emissions at times.
- A new, separate ETS will be established for the buildings and road transport sectors and some other sectors, mainly small industry according to the EU. Changes specifically tailored to the aviation sector were also approved.

Carbon Border Adjustment Mechanism (CBAM)

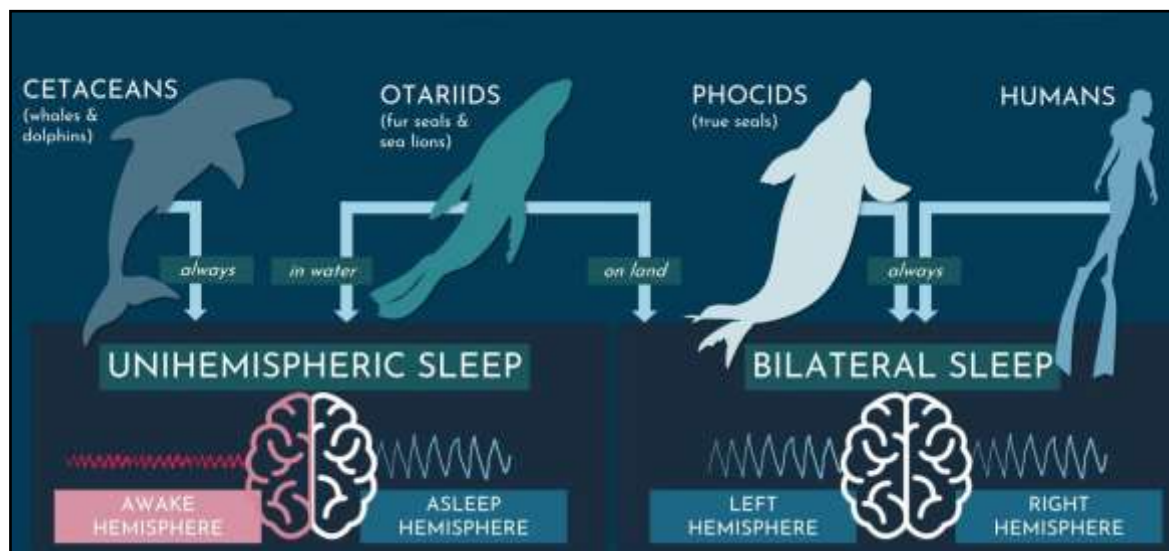
- The EU will introduce CBAM which is a landmark tool to put a fair price on the carbon emitted during the production of carbon intensive goods that are entering the EU, and to encourage cleaner industrial production in non-EU countries. The aim of CBAM is to prevent the **offsetting of the greenhouse gas reduction efforts of the EU**, by increasing emissions outside its borders through the relocation of production to countries where policies applied to fight **climate change** are less ambitious than those of the EU.

Social Climate Fund

- The EU is setting up a **Social Climate Fund**. The bulk of the funds would come from the **carbon market revenues** generated by the EU ETS. The member states will be contributing the rest. The fund will be used by member states to finance measures and investments to support vulnerable households, micro-enterprises and transport users and help them cope with the price impacts of an emissions trading system for the buildings, road transport and additional sectors.

Topic 25. ELEPHANT SEALS ENTER ‘SLEEP SPIRAL’ DURING DEEP OCEAN DIVES

Important for the subject : Environment



Northern elephant seals might be masters of multitasking in the animal kingdom because they've learned how to sleep and dive at the same time — all while avoiding predators.

- The **elephant seals can spend seven or eight months on foraging trips** in the North

Pacific Ocean and travel for thousands of miles away from land, which **led researchers to question how and where the marine mammals sleep** in the high seas.

- A new study, involving seals **fitted with caps** similar to those worn by humans in sleep clinics, **revealed that the seals sneak in short naps during deep dives** while holding their breath.
- When the seals experience **sleep paralysis as they enter rapid eye movement**, or REM, sleep, **they lose control of their posture and continue to spiral down** in a corkscrew pattern. The researchers refer to this as a “sleep spiral.”
- The research marked the first time scientists **recorded brain activity in freeranging wild marine mammals**, capturing data from 104 sleep dives.
- The **10-minute naps during these 30-minute dives** help elephant seals get about two hours of sleep per day during foraging trips, as opposed to the 10 hours they catch while snoozing on the beach during breeding season.

Elephant Seal:

- Elephant seals are **large marine mammals** that belong to the family Phocidae, also known as “true seals.”
- There are two species of elephant seals, the **northern elephant seal and the southern elephant seal**, both of which are found in the Pacific Ocean.

Northern Elephant Seals:

- Northern elephant seals are **found across the Pacific coast of the United States, Canada and Mexico**.
- They generally breed and give birth in California and Baja California. That too **usually on offshore islands** from December to March. They **fast during mating** season, losing perhaps a third of their body weight.

Southern Elephant Seals:

- Southern elephant seals are the **largest of all seals**. They live in subAntarctic and Antarctic waters that feature brutally cold conditions.
- Southern elephant seals **breed on land but spend their winters in the frigid Antarctic waters** near the Antarctic pack ice.
- These seals are known for their **large size**, with adult males weighing up to 4,500 kg and

reaching lengths of up to 6.5 meters.

- Elephant seals are known for their **unique lifestyle**, spending most of their lives at sea and **only coming ashore for breeding and molting**.
- They are **known for their deep dives**, with some individuals reaching depths of up to 2,000 meters and **staying underwater for over two hours at a time**.
- These seals play an **important role in the marine ecosystem**, as they are a **key predator of squid and fish**. Additionally, their **nutrient-rich feces contribute to the growth of phytoplankton**. These seals play an **important role in the marine ecosystem**, as they are a **key predator of squid and fish**. Additionally, their **nutrient-rich feces contribute to the growth of phytoplankton**, which form the base of marine food chain.

Topic 26. FLY ASH PARTICLES FOUND IN ANTARCTIC ICE

Important for the subject : Environment

In a first, fly ash particles found in Antarctic ice, thousands of kilometers from potential source.

- **Spheroidal carbonaceous particles (SCP)**, a component of fly ash, have been **identified** for the first time in an **Antarctic ice core**, according to a new study. Not just that, the **particles recovered dated back to 1936**, according to scientists from British Antarctic Survey and the University College London.
- SCPs have no other anthropogenic or natural sources other than fossil fuel combustion. Thus, they are an unambiguous **environmental indicator of industrialization**.
- The study provided the first evidence that SCPs have not only been transported to continental Antarctica, but that those enduring **physical markers of fossil fuel combustion have been trapped in ice layers** since the early decades of the 20th century.
- **Atmospheric circulation and transport** processes have **probably influenced the deposition of SCPs in Antarctica** throughout the twentieth century, especially related to the strength and position of the Southern Hemisphere westerly winds.
- **5/6The westerly winds are predicted to increase in strength during the 21st century** and this might lead to an increased deposition of fly ash particles and other.

Topic 27. REFERENDUM FOR NEW CONSTITUTION IN UZBEKISTAN

Important for the subject : International Relations



Why in News?

Uzbekistan holds referendum on new Constitution that puts human rights at the forefront. In the referendum, the voters would be asked if they support rewriting the Constitution. Constitutions of 190 countries, including that of India, were studied to bring in holistic and comprehensive changes to the Constitution of the country.

What's in the New Draft Constitution

- The new draft would **rewrite over 60%** of the current charter. Promises more freedoms, **better social protection, gender equality, and abolition of death penalty**, among others.
- Defines Uzbekistan as a **sovereign, democratic, rule of law, social and secular state**. All changes are based on the idea that **human rights and freedoms are paramount**.
- The new charter is believed to better the investment and business environment of the

country. Constitutional Amendments represent “a transformation of the new Uzbekistan, where once the state came first, now the **citizen comes first**”.

- Seeks to make Uzbekistan a more **social and welfare state** where the social protection of the common citizen is enhanced.
- A lot of thought has been given to vulnerable families and people in need of education, medicare, etc. There’s greater **decentralization of power**.

Critic’s View

- If the new Constitution is adopted the **presidential term would be extended to seven years with a two consecutive term limit**. Mr. Mirziyoyev, whose current term expires in 2026, can serve as President for two more seven year terms. He came to power in 2016 and is currently serving his second term, which is the last under the current Constitution.

About the Referendum

- Uzbekistan’s Constitutional Commission received more than 2, 20,000 proposals from citizens during the drafting process.
- Election Commission officials made all arrangements for a free vote which would be held in the presence of international observers.
- The voting would take place in the presence of the representatives of all five recognized political parties in the country as well as **international observers, media and civil society representatives**.

What is Referendum?

- Referendum is a procedure whereby a **proposed legislation** is referred to the electorate for settlement by their **direct votes**.
- Politically, referendums are a tool for the expression of **direct democracy**. In modern times, most referendums are seen in the perspective of representative democracy.

About Uzbekistan

- Uzbekistan is a **landlocked** Central Asian country of 35 million population. Became independent in 1991 following the disintegration of the Soviet Union

About Bukhara – has 84 voting stations for the referendum

- 2000 year old Ancient City in Uzbekistan situated in **the Silk route**. Bukhara, Fergana and Samarkand in Uzbekistan emerged as **major towns on the trade routes linking India with Europe and China**.
- **Indian merchants** based in Samarkand and Bukhara were an integral part of the local economy in Uzbekistan.

India-Uzbekistan

- **India's Election Commission** has been **invited to witness** the “historic” referendum on the constitutional reforms. The ties between India and Uzbekistan have been on an upswing in the last few years.
- Both sides have shown keen interest in further expanding the ties in a number of areas including **trade and investment, energy and people-to-people exchanges**.

Topic 28. GUM ARABIC: WHY SUDAN WAR COULD HIT YOUR FIZZY DRINKS AND CANDY

Important for the subject : International relations

Why in News?

About 70% of the world's supply of gum arabic, for which there are few substitutes, comes from the acacia trees in the Sahel region that runs through Africa's third-largest country, which is being torn apart by fighting between the army and a paramilitary force.

What is Gum Arabic

- Gum Arabic is a natural gum originally consisting of the hardened sap of two species of the Acacia tree, Senegaliasenegal and Vachelliaseyal. The term “gum arabic” does not legally indicate a particular botanical source.
- The gum is harvested commercially from wild trees, mostly in Sudan (80%) and throughout the Sahel, from Senegal to Somalia.

Health benefits of Gum Arabic

- Gum arabic is a rich source of dietary fibers. It is also used in food and pharmaceutical industries as a safe thickener, emulsifier, and stabilizer.
- It is regarded as a prebiotic that enhances the growth and proliferation of the beneficial

intestinal microbiota and therefore its intake is associated with many useful health effects.

These health benefits include:

- Improved absorption of calcium from the gastrointestinal tract

Anti-diabetic

- Anti-obesity (gum arabic lowers the body mass index and body fat percentage) Lipid lowering potential (gum arabic decreases total cholesterol, LDL, and triglyceride) Antioxidant activities

Kidney and liver support

- Immune function via modulating the release of some inflammatory mediators Prebiotic improving the intestinal barrier function, preventing colon cancer, and alleviating symptoms of irritable bowel diseases.
- In rats, a protective effect on the intestine against the adverse actions of the NSAID drug meloxicam.

Other uses:

Food

- Gum arabic is used in the food industry as a stabiliser, emulsifying agent, and thickening agent in icing, fillings, soft candy, chewing gum, and other confectionery and to bind the sweeteners and flavourings in soft drinks.

Painting and art

- Gum arabic is used as a binder for watercolor painting because it dissolves easily in water.

Ceramics

- Gum arabic has a long history as additives to ceramic glazes. It acts as a binder, helping the glaze adhere to the clay before it is fired, thereby minimising damage by handling during the manufacture of the piece.

Photography

Print making

- Pyrotechnics Gum arabic is also used as a water-soluble binder in fireworks composition.

Fuel Charcoal

Distribution

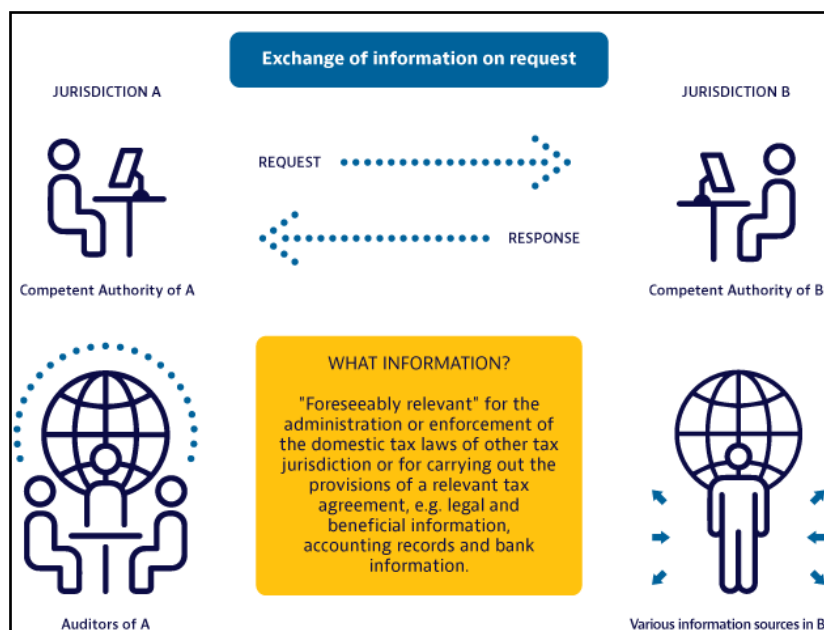
- The trees are native of North Africa and grow mainly in the sub.Sahara or Sahel zone of Africa and also in Australia, India and South America. The main populations of gumproducing Acacia species are found in Mauritania, Senegal, Mali, Burkina Faso, Niger, Nigeria, Chad, Cameroon, Sudan, Eritrea, Somalia, Ethiopia, Kenya, and Tanzania.
- Acacia senegal is found in some parts of India mainly in the dry rocky hills of south east Punjab, in the northern Aravalli hills and other drier parts of Rajasthan and Gujarat.

About Sudan

- It shares its border with seven countries: Libya, Egypt, Chad, the Central African Republic, South Sudan, Ethiopia, and Eritrea.

Topic 29. OECD'S AUTOMATIC EXCHANGE OF INFORMATION (AEOI) FRAMEWORK

Important for the subject : International Relations



Why in News?

India wants non-financial assets included in OECD information exchange framework. At present, the OECD's AEOI framework provides for sharing of financial account details. India is pushing to widen the scope of the common reporting standard (CRS) at the G20 grouping to include non-financial assets like real estate properties under the automatic exchange of information among OECD countries.

What is OECD's AEOI Framework

- Provides for sharing of financial account details among signatory countries with an aim to check tax evasion.
- India currently has AEOI with 108 jurisdictions for receiving financial information and with 79 jurisdictions for sending information automatically.
- Flow of information has helped us in increasing tax collection and revenue buoyancy has increased

Related Provisions

- OECD also approved the **Crypto-Asset Reporting Framework (CARF)** – Provides for the reporting of tax information on transactions in Crypto-Assets in a standardized manner, with a view to automatically exchanging such information.

OECD's Tax Transparency report

- Asian nations estimated to have lost €25 billion in revenue in 2016 due to tax evasion and illicit financial flows.
- 4 per cent of Asia's financial wealth amounting to Euro 1.2 trillion was held offshore, leading to a potential annual revenue loss of Euro 25 billion for the region in 2016.
- Slower economic growth, increased government expenditure on public health, social and economic support, and other areas make the fight against tax evasion and other illicit financial flows (IFFs) even more pressing. Asia accounted for 38.8 per cent of the estimated USD 7.8 trillion lost by developing countries due to IFFs between 2004-2013.
- The **'Tax Transparency in Asia 2023' report** was launched at the meeting of the **Asia Initiative of the Global Forum on Transparency and Exchange of Information for Tax Purposes**. Currently **167 jurisdictions are members** of the Global Forum which

include all G20 countries.

About Common Reporting Standard (CRS)

- The Common Reporting Standard (CRS) is developed in response to the **G20 request** and **approved by the OECD Council** on 15 July 2014.
- It requires jurisdictions to **obtain information** from their financial institutions and **automatically exchange** that information with other jurisdictions on an **annual basis**.
- It specifies the **financial account information** to be exchanged, the **financial institutions** required to report, the **different types of accounts and taxpayers** covered, as well as **common due diligence procedures** to be followed by financial institutions.

About OECD

- The Organization for Economic Co-operation and Development (OECD) is an **international, intergovernmental economic organization of 38 countries** that works to build better policies for better lives.
- OECD was founded in the year **1961** to **stimulate world trade and economic progress** headquartered at **Paris, France**.
- OECD originated in 1948, as the Organization for European Economic Co-operation (OEEC) to govern the predominantly **US-funded Marshall Plan for post-war reconstruction on the continent**.
- Most OECD members are **high-income economies** with a very **high Human Development Index (HDI)** and are regarded as developed countries. OECD members are **democratic** countries that support **free-market economies**. **India** is a **key partner of OECD**.

Topic 30. SUDAN'S RAPID SECURITY FORCES

Important for the subject : International Relations

Why in News?

Sudan's military and its paramilitary forces have been involved in a fierce battle against each other since April 15, leaving at least 420 people dead and more than 3,700 wounded. The clashes follow months of heightened tension between the Army Chief and the Rapid Support Force (RSF) head. Both the generals are at loggerheads as they fight for control of Sudan's

major institutions.

Rapid Support Forces in Sudan

- Trace its roots to the **Janjaweed militias** — a group of Arab tribes primarily based in western Sudan, including the contentious region of Darfur.
- **Janjaweed militias** called themselves **horsemen** – helped the Sudanese government **quell a rebellion by peasants in Darfur** by perpetrating violence against the rebels and civilians in isolated areas.
- According to the United Nations, an estimated 300,000 people were killed in the conflict between 2003 and 2008, and 2.5 million more were displaced.
- In 2007, the United States government declared the violence in Darfur “**genocide**” perpetrated by the government and its allied forces, including the Janjaweed militias.
- The **International Criminal Court** opened investigations into the genocidal violence, **indicting Sudan’s then President Bashir**, on charges of genocide and crimes against humanity in 2009.

Formal Constitution in 2013.

- The **Sudan President institutionalized** the Janjaweed militias in 2013, when it became the Rapid Support Forces (RSF) and Hamdan was appointed as its head.
- Then, RSF carried out **brutal violence across Sudan** – war crimes in Darfur in 2014 and 2015, killing over 100 people in Khartoum in 2019. Expanded to become the **President’s guard** against any coup by the Army.
- In 2015, the RSF along with Sudan’s Army, **supplied troops to fight in the war in Yemen** to support Saudi Arabia and the United Arab Emirates troops, in return for received money and weapons.
- Partnered with the Russian mercenary Wagner Group in 2017 to mine the vast gold reserves in Sudan, which expanded the political, economic and political influence of RSF. Led to conflict with the Army.
- Members include former military and intelligence officers with estimated 70,000 to 1,50,000 fighters. More fighters recruited from Sudan’s east and north to widen support.

About the International Criminal Court

- The International Criminal Court (ICC) investigates and, where warranted, tries

individuals charged with the gravest crimes of concern to the international community: genocide, war crimes, crimes against humanity and the crime of aggression.

- Governed by an international treaty called ‘The Rome Statute’, the ICC is the world’s first permanent international criminal court.
- India is not a party to Rome Statute along with US and China and thus, is not a member of ICC. ICC is not a UN organization but it has a cooperation agreement with the United Nations.
- When a situation is not within the Court’s jurisdiction, the United Nations Security Council can refer the situation to the ICC granting it jurisdiction. This has been done in the situations in Darfur (Sudan) and Libya.

Topic 31. NUCLEAR LIABILITY LAW

Important for the subject : International Relations

The issues regarding India’s nuclear liability law continue to hold up the more than a decade-old plan to build six nuclear power reactors in Maharashtra’s Jaitapur, the world’s biggest nuclear power generation site under consideration at present.

Law governing nuclear liability in India

- **Laws on civil nuclear liability ensure that compensation is available to the victims for nuclear damage caused by a nuclear incident or disaster and set out who will be liable for those damages.**
- **The international nuclear liability regime consists of multiple treaties and was strengthened after the 1986 Chernobyl nuclear accident.**
- **The umbrella Convention on Supplementary Compensation (CSC) was adopted in 1997 with the aim of establishing a minimum national compensation amount.**

India is signatory to the CSC.

The Civil Liability for Nuclear Damage Act:

- **To keep in line with the international convention, India enacted the Civil Liability for Nuclear Damage Act (CLNDA) in 2010, to put in place a speedy compensation mechanism for victims of a nuclear accident.**
- **The CLNDA provides for strict and no-fault liability on the operator of the nuclear**

plant, where it will be held liable for damage regardless of any fault on its part.

- It also specifies the amount the operator will have to shell out in case of damage caused by an accident at ₹1,500 crore and requires the operator to cover liability through insurance or other financial security.
- In case the damage claims exceed ₹1,500 crore, the CLNDA expects the government to step in and has limited the government liability amount to the rupee equivalent of 300 million Special Drawing Rights (SDRs) or about ₹2,100 to ₹2,300 crore.
- The Act also specifies the limitations on the amount and time when action for compensation can be brought against the operator.

Reactors in India:

- India currently has 22 nuclear reactors with over a dozen more projects planned. All the existing reactors are operated by the state-owned Nuclear Power Corporation of India Limited (NPCIL).

Supplier liability clause as an issue in nuclear deals

- Foreign suppliers of nuclear equipment from countries as well as domestic suppliers have been wary of operationalizing nuclear deals with India as it has the only law where suppliers can be asked to pay damages.
- Concerns about potentially getting exposed to unlimited liability under the CLNDA and ambiguity over how much insurance to set aside in case of damage claims have been sticking points for suppliers.
- While liability for operators is capped by the CLNDA, this exposes suppliers to unlimited amounts of liability.

Existing projects in India

- The Jaitapur nuclear project has been stuck for more than a decade. Other nuclear projects, including the nuclear project proposed in Kovvada, Andhra Pradesh, have also been stalled.
- Despite signing civil nuclear deals with a number of countries, including the U.S., France and Japan, the only foreign presence in India is that of Russia in Kudankulam — which predates the nuclear liability law.

What is the government's stand?

- The central government has maintained that the Indian law is in consonance with the CSC.
- The provision “permits” but “does not require” an operator to include in the contract or exercise the right to recourse.

Topic 32. NAGORNO-KARABAKH ENCLAVE

Important for the subject : International Relations



Azerbaijan said it set up a checkpoint on the Lachin corridor, the only land link between Armenia and the disputed Nagorno-Karabakh enclave.

Nagorno-Karabakh Region

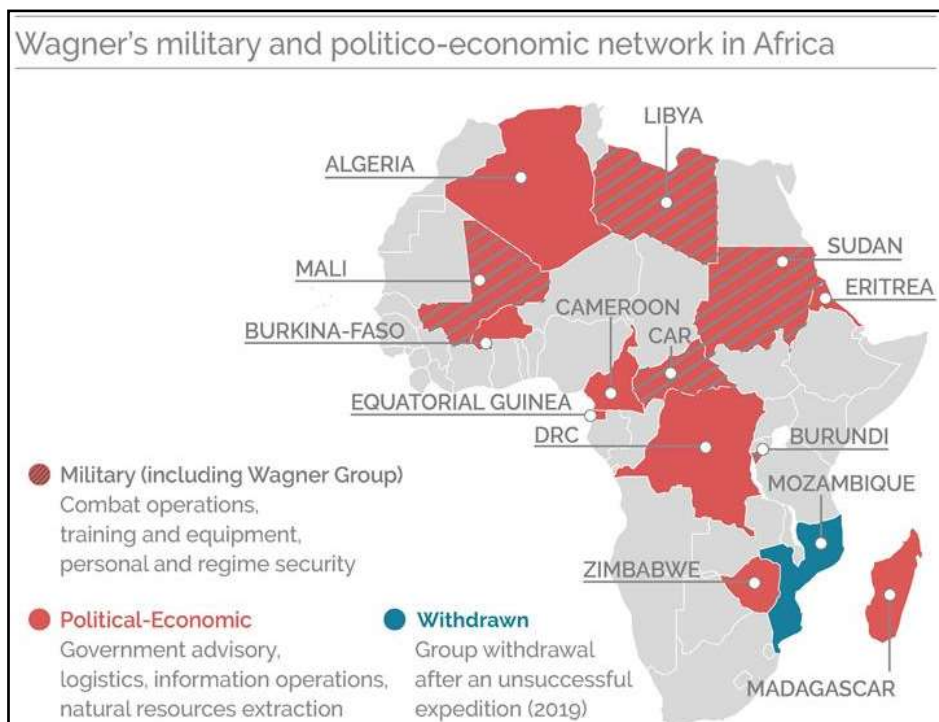
- Nagorno-Karabakh is a mountainous and heavily forested region that under international law is recognized as part of Azerbaijan. However, ethnic Armenians who constitute the vast majority of the population there reject Azeri rule (the legal system of Azerbaijan).
- After Azerbaijan's troops were pushed out of the region following a war in the 1990s, these ethnic Armenians have been in administrative control of Nagorno-Karabakh, with support from Armenia.

Strategic Significance:

- The energy-rich Azerbaijan has built several gas and oil pipelines across the Caucasus (the region between the Black Sea and the Caspian Sea) to Turkey and Europe.
- Some of these pipelines pass close to the conflict zone (within 16 km of the border). In an open war between the two countries, the pipelines could be targeted, which would impact energy supplies and may even lead to higher oil prices globally.

Topic 33. WAGNER GROUP ACTIONS IN AFRICA

Important for the subject : International Relations



In the wake of the **political crisis in Sudan** which recently has turned into a countrywide armed conflict, there have been **questions raised over the involvement of the Wagner group.**

Wagner Group

- The Wagner group is a **Russian private paramilitary organization** which is led by Yevgeny Prigozhin, a rich businessman who is famously known as “**Putin’s chef**”.
- The **Wagner Group is known to have very close ties with Russian President Vladimir Putin.**
- **The first operation of the Group was helping Russia annex Crimea in 2014** and since

then the Wagner Group has been used in various Russian military operations in many countries.

- Although the Wagner group works closely with the Russian security apparatus, **it is legally not recognized as a Russia-based private military company as private mercenary groups are illegal in Russia.**
- However, in 2018, the Russian President **recognized the group saying that the group has the right to pursue its interests anywhere in the world as long as they do not break Russian law.**
- Apart from engaging in counter-militancy operations in Africa, the group is also involved in various political, economic and military fields.
- The group has been **active in countries like Sudan, Mali, the Central African Republic, Mozambique and Libya in Africa.**
- The UN's International Convention against the Recruitment, Use, Financing and Training of Mercenaries states that the **states are required to bear the responsibility for the activities of the mercenaries** who violate principles of international law which threaten sovereign equality, political independence, territorial integrity of states and self-determination of people.
- However, the **Wagner Group is not a Russia-based private military company legally.**

Topic 34. OPERATION KAVERI

Important for the subject : International Relations



India has initiated an operation to evacuate its nationals from conflict-hit Sudan.

Operation Kaveri

- As per reports, close to 3,000 Indians are stuck in various parts of Sudan such as the national capital, Khartoum and other provinces like Darfur.
- **Operation Kaveri has been initiated to bring back such stranded Indian citizens from Sudan.** Stranded Indian citizens are **being evacuated from Port Sudan.**
- India has deployed two C-130J heavy-lift aircraft in Jeddah (Saudi Arabia) and has sent INS Sumedha to Port Said (Egypt) for the operation.

Major evacuation operations

- **Operation Ganga:** In a mission to evacuate stranded Indians from war-torn Ukraine, the

Indian government kicked off Operation Ganga in February 2022.

- **Operation Devi Shakti:** An evacuation operation by the Indian Armed Forces (IAF) was kicked off in August 2021 to safely bring back Indian nationals from Afghanistan after the collapse of the Islamic Republic of Afghanistan and the fall of Kabul, the capital city of the Taliban.
- **Vande Bharat Mission:** Special flights were operated across to globe in this mission to bring back the nationals who were left stranded in foreign countries due to the coronavirus pandemic.
- **Wuhan Airlift:** In one of the most difficult evacuation flights, India airlifted its citizens safe from China's coronavirus-hit city of Wuhan in January 2020.
- **Operation Maitri:** The government of India carried out this mission to safely bring the nationals from Nepal after the deadly earthquake in 2015.
- **Operation Raahat:** Hundreds of Indians and other nationals were rescued under this operation during the unrest at Yemen's capital Sana'a after the complete takeover by Houthi rebel fighters in January 2015
- **Operation Amnesty Airlift:** The mission was carried out in September 1996 to bring back the Indian nationals who did not have valid permits from the United Arab Emirates.
- **Kuwait Airlift:** In one of the most massive operations in Indian history, the Indian Air Force joined hands with Air India in airlifting stranded Indian nationals in Kuwait in August 1990.

Topic 35. EUROPEAN COUNTRIES TO EXPAND NORTH SEA WIND FARMS

Important for the subject : International Relations

Nine European countries have pledged to multiply the capacity of offshore wind farms in the North Sea by eight times current levels before 2050, turning it into what Belgium's energy minister called "Europe's biggest green power plant".

About North Sea

- The North Sea is a part of the Atlantic Ocean, located between Norway and Denmark in the east, Scotland and England in the west, and Germany, the Netherlands, Belgium and France in the south.
- An offshoot of the North Sea is the Strait of Skagerrak, between Denmark, Norway,

and Sweden, which connects to the Baltic Sea through the **Kattegat, Öresund, the Great Belt and the Little Belt.**

- In the south, the **North Sea connects with the rest of the Atlantic through the Strait of Dover into the English Channel and in the north through the Norwegian Sea.**
- Major rivers that drain into the North Sea include the **Forth (at Edinburgh), Elbe (at Cuxhaven), the Weser (at Bremerhaven), the Ems at Emden, the Rhine and Meuse (at Rotterdam), the Scheldt (at Flushing), the Thames, and the Humber (at Hull).**
- The **Kiel Canal**, one of the world's busiest artificial waterways, **connects the North Sea with the Baltic.**

Topic 36. INDIA TO HOST SCO DEFENCE MINISTERS' MEETING

Important for the subject : International Relations

India will be hosting the Defence Ministers from the **Shanghai Cooperation Organization (SCO) member countries and observer countries such as Belarus and Iran.** The members of SCO include **Russia, China, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, Pakistan and India.**

India is the chairman of the SCO for 2023.

- During the meeting, the Defence Ministers are expected to discuss issues and matters concerning regional peace and security, counter-terrorism efforts within the SCO and effective multilateralism.

About SCO

- The SCO is a permanent intergovernmental international organisation. It is a Eurasian political, economic, and security alliance and has been the primary security pillar of the region.
- It was **established in 2001.** It was preceded by the **Shanghai Five mechanisms.**
- The **Heads of State Council (HSC) is the supreme decision-making body in the SCO.** It meets once a year and adopts decisions and guidelines on all important matters of the organization.
- The organization has two permanent bodies: the SCO Secretariat based in Beijing. The Executive Committee of the Regional Anti-Terrorist Structure (RATS) based in Tashkent.

- **Eight member states:** India, Kazakhstan, China, Kyrgyzstan, Pakistan, Russia, Tajikistan, and Uzbekistan.
- **Four observer states:** Afghanistan, Belarus, Iran and Mongolia.

Topic 37. BOOK HATE SPEECH CASES EVEN WITHOUT COMPLAINT: SC

Important for the subject : Polity

Calling hate speech a serious offence that can affect the secular fabric of India, the Supreme Court directed all states to suo motu register cases of such offences even if there is no formal complaint.

Key highlights of the SC Order

- Any hesitation to act will be viewed as contempt of the top court and appropriate action will be taken against the erring officers.
- All states and UTs shall ensure that immediately as and when any speech or any action takes place which attracts offences such as Sections 153A, 153B and 295A and 505 of the IPC, suo motu action will be taken to register cases even if no complaint is forthcoming and proceed against the offenders in accordance with law.

Legal Provisions of Hate Speech in India:

- **Article 21:** Responsible speech is the essence of the liberty granted under Article 21 of the Constitution.
- **Article 19(2):** It guarantees freedom of speech and expression to all citizens of India.
- **Exception:** Hate speech **has not been defined in any law in India.** However, legal provisions in certain legislations prohibit select forms of speech as an exception to freedom of speech.

Legislations around Hate speech: The Indian Penal Code, 1860

- **Section 124A IPC** penalizes sedition
- **Section 153A IPC** penalizes ‘promotion of enmity between different groups on grounds of religion, race, place of birth, residence, language, etc., and doing acts prejudicial to maintenance of harmony’.
- **Section 153B IPC** penalizes ‘imputations, and assertions prejudicial to national

integration.

- **Section 295A IPC** penalizes ‘deliberate and malicious acts, intended to outrage the religious feelings of any class by insulting its religion or religious beliefs.
- **Section 298 IPC** penalizes ‘uttering, words, etc., with deliberate intent to wound the religious feelings of any person’.
- **Section 505(1) and (2) IPC** penalizes the publication or circulation of any statement, rumor or report causing public mischief and enmity, hatred or ill-will between classes.

Topic 38. WOMEN’S RESERVATION BILL CANNOT WAIT ANY LONGER

Important for the subject : polity

It is disheartening to witness that even 75 years after Independence, Parliament lacks substantial representation from half the population, with women holding just 14% of the seats.

A promising start

- **Leading CMs:** Just a decade ago, three of India’s largest States, West Bengal, Tamil Nadu, and Uttar Pradesh, were in the spotlight for being led by women Chief Ministers.
- **Leading Leaders:** While SushmaSwaraj led the Opposition in the LokSabha, Sonia Gandhi served as both President of the Congress Party and Chairperson of the United Progressive Alliance.
- **President of India:** Also, India had its first woman President, PratibhaPatil around the same time.

Historical Background

- **Pre-Independence era:** From the pre-Independence era when several women’s organizations demanded political representation for women.
- **Rising demand:** It can be **traced back to 1955** when a government appointed committee recommended that 10% of seats in the LokSabha and State legislative assemblies should be reserved for women.
- **In 1996, the Women’s Reservation Bill (introduced in LokSabha) proposed to reserve one-third of seats in the LokSabha and State Legislative Assemblies for women.** However, the **bill lapsed due to strong opposition from some political parties.**
- Again the issue gained momentum in the 2000s and the bill was passed in RajyaSabha.

- **National Perspective Plan for Women (1988):** The National Perspective Plan for Women (1988) recommended that **30% of seats in all elected bodies should be reserved for women.** This recommendation was reiterated in the **National Policy for the Empowerment of Women**, which was adopted in 2001.

Global Examples

- **Outperforming their male counterparts:** The Scandinavian countries have implemented policies and governance structures that support gender equality and women's empowerment, which includes women's representation in political and leadership positions.
- **Implementing best policies:** Countries led by women have shown to have some of the best policies and governance practices. The deep scars in Rwanda, a central African nation, from the genocide, are being healed by predominantly a leadership that comprises women.
- **Norway quota:** Norway implemented a quota system in 2003 that required 40% of seats on corporate boards to be occupied by women.

Topic 39. BREACH OF PRIVILEGE PROBE AGAINST MP

Important for the subject : Polity

The **Chairman of Rajya Sabha** has referred a **complaint of “breach of privilege”** to a **committee against an MP** for alleged “disrespectful” remarks made against the Chair. The committee has been asked to investigate and report the matter, while no deadline has been mentioned.

Parliamentary privilege

- Parliamentary privilege refers to rights and immunities enjoyed by Parliament as an institution and MPs in their individual capacity, without which they cannot discharge their functions as entrusted upon them by the Constitution
- According to the Constitution, the powers, privileges and immunities of Parliament and MPs are to be defined by Parliament (Article 105). No law has so far been enacted in this respect.
- In the absence of any such law, it continues to be governed by British Parliamentary

conventions.

Breach of privilege

- A breach of privilege is a violation of any of the privileges of MPs/Parliament. Among other things, any action ‘casting reflections’ on MPs, parliament or its committees; could be considered breach of privilege.
- A notice is moved in the form of a motion by any member of either House against those being held guilty of breach of privilege
- The **Speaker/Chairperson can decide on the privilege motion himself or herself or refer it to the privileges committee of Parliament.**

Rules Governing Privilege

- The **Constitution (Article 105) mentions two privileges, i.e. freedom of speech in Parliament and right of publication of its proceedings.**
- **Rule No 222 in Chapter 20 of the Lok Sabha Rule Book and correspondingly Rule 187 in Chapter 16 of the Rajya Sabha rulebook governs privilege.**
- A member may, with the consent of the Speaker or the Chairperson, raise a question involving a breach of privilege either of a member or of the House.
- The rules mandate that any notice should be relating to an incident of recent occurrence and should need the intervention of the House.

Privileges Committee

- In the Lok Sabha, the **Speaker nominates a committee of privileges consisting of 15 members as per respective party strengths.**
- A report is then presented to the House for its consideration. The Speaker may permit a half-hour debate while considering the report.
- The Speaker may then pass final orders or direct that the report be tabled before the House. A resolution may then be moved relating to the breach of privilege that has to be unanimously passed.
- In the **Rajya Sabha, the deputy chairperson heads the committee of privileges, that consists of 10 members.**

Role of the Speaker/Rajya Sabha Chair

- The Speaker/RS chairperson is the first level of scrutiny of a privilege motion. The Speaker/Chair can decide on the privilege motion himself or herself or refer it to the privileges committee of Parliament.
- If the Speaker/Chair gives consent under Rule 222, the member concerned is given an opportunity to make a short statement.

Topic 40. WRESTLERS IN SC: WHAT LAW SAYS ON FIR IN SEXUAL HARASSMENT CASES

Important for the subject : Polity

Why in News?

The Supreme Court issued notice to the Delhi Police on a petition filed by seven wrestlers seeking an FIR against BrijBhushanSharan Singh, Wrestling Federation of India (WFI) president and BJP MP, on allegations of sexual harassment.

Law on FIR after a Sexual Harassment Complaint

- **Section 154 (1) of the Code of Criminal Procedure** – enables police to register an FIR after receiving information about a cognizable offence.
- A **cognizable offence/case** – A police officer may make an **arrest without a warrant**.
- Indian Penal Code Sections pertaining to **sexual harassment and sexual assault** fall within the category of **cognizable**
- The law also has provision for the registration of a ‘Zero FIR’.

What is Zero FIR?

- Even if the alleged offence has not been committed within the jurisdiction of the police station approached, the police can file an FIR and transfer it to the police station concerned.

Justice JSVerma Committee Report

- The **Committee on Amendments to Criminal Law**, aka the Justice JS Verma Committee – formed in the aftermath of the December 16, 2012 Delhi gangrape case.
- Recommended insertion of a section where if an **officer in-charge of a police station** refuses “or without reasonable cause” fails to record information related to a cognizable

offence, he shall be **punished**. Hence section 166A was inserted in the Criminal Law (Amendment) Act, 2013.

What is Section 166A of Criminal Law (Amendment) Act, 2013

- If a public servant failed to conduct an investigation wherever it necessitates or especially if **failed to register an FIR** in cases of sexual offences under **Section 154** of the Code of Criminal Procedure, rigorous imprisonment for a term of minimum **six months** and maximum **two years** can be given, and he shall also be liable to **paying a fine**.
- Although this includes all cognizable offences, the provision particularly mentions certain sections of the IPC, including those related to sexual harassment, rape, and gangrape.
- Ministry of Home Affairs issued advisories on mandatory action by the police in cases of crimes against women.

FIR Provisions Under POCSO Act

- **Section 21**– Any failure to report the offence or failure to record such an offence shall be punished with jail extending to six months or a fine or both.
- Therefore Report to be filed mandatorily on receiving a complaint including from a child.

Refusal to File FIR by Police

- **Section 154 (3) of the CrPC** – a person aggrieved after refusal to file FIR by a police in-charge can send the information to the Superintendent of Police. The SP, after verification that the information discloses the commission of an offence, shall either investigate the case herself or direct for a probe.

Section 156 of CrPC

- If a person is aggrieved by the police's refusal to file an FIR, a **complaint** can be made before a **magistrate under section 156 (3)**. The magistrate court can then order registration of a case at the police station.
- The complaint before the magistrate would be **treated as an FIR** and the police can initiate its investigation

Lalita Kumari vs. Govt. of UP and ors. 2013

- Issue – whether the police officer is bound to file an FIR for information received of a

cognizable offence or does the officer have the power to conduct a 'preliminary inquiry' before the FIR.

- Constitution bench judgement – registration of an FIR under section 154 CrPC is mandatory if information of a cognizable. Scope of preliminary inquiry – only to ascertain whether the information reveals any cognizable offence. **Preliminary Enquiry should not exceed seven days.**

Topic 41. AUTONOMOUS HILL DEVELOPMENT COUNCIL

Important for the subject : Polity

Why in News?

Assam tribal group Dimasas National Liberation Army signs pact with government to shun violence, following a tripartite agreement, Memorandum of Settlement (MOS) with the Centre and the Assam government. Among the provisions of the MOS is formation of a Dimasas Welfare Council, headquartered in Guwahati.

Autonomous Hill Development Council:

- Established under **Sixth Schedule** of Indian Constitution for the administration of tribal areas in **Assam, Meghalaya, Tripura and Mizoram.**

Article 244 (2) and Article 275 (1) of the Constitution.

- To safeguard the rights of the tribal population in these states. **Governor** is empowered to increase or decrease the areas or change the names of the autonomous districts.
- Fifth schedule areas – executive powers of the Union will apply; But **Sixth schedule areas** – within **executive authority of the state.**
- Fifth schedule – administration and control of scheduled areas and scheduled tribes in any state except the four states of Assam, Meghalaya, Tripura and Mizoram.

These 4 states are administered under sixth schedule.

- The **acts of Parliament or the state legislature** do not apply to autonomous districts and autonomous regions or apply with specified modifications and exceptions.
- The Councils have also been endowed with **wide civil and criminal judicial powers**, for example establishing village courts etc. However, the jurisdiction of these councils is

Important for the subject to the jurisdiction of the concerned High Court.

- In Assam – Hill districts of DimaHasao, KarbiAnglong and West Karbi and the Bodo Territorial Region are under Sixth Schedule.
- According to the MoS signed, Dimasa Welfare Council, headquartered in Guwahati is to be formed based on the recommendations of which the state will provide development funds for Dimasa people “residing outside the jurisdiction of North Cachar Autonomous Hills Council”.

MOS Provisions

- Economic rehabilitation of surrendered cadre
- Withdraw of criminal cases for non-heinous offences
- Review of criminal cases for heinous offences a case-to-case basis
- The Centre and the state may consider a Rs500- crore package each over five years for infrastructure development.

Topic 42. MAHANADI WATER DISPUTE***Important for the subject : Polity***

A controversy has erupted over Chhattisgarh’s release of Mahanadi water into the lower catchment area of the river system.

Details of the Dispute

- As per the allegation of the Water Resource Department of Odisha, **Chhattisgarh has opened the gates of Kalma Barrage through which 1,000-1,500 cusecs of water is flowing into Mahanadi and have said that it is unusual for Chhattisgarh to release water during non-monsoon season.**
- The officials of the department claim that gates were opened ahead of the scheduled visit of the former Supreme Court Justice A.M. Khanwilkar who is the Chairperson of the Mahanadi Water Disputes Tribunal.
- Odisha has expressed concerns over Chhattisgarh’s management of Mahanadi river water in the upper catchment area as Chhattisgarh in recent times has constructed several barrages restricting the flow of water in Odisha which is a lower catchment area.
- The non-availability of water in the Mahanadi River during the non-monsoon season has

adversely impacted rabi crops and reduced drinking water availability in Odisha.

Mahanadi Tribunal

- In 2018, the Supreme court directed the Centre to notify a Tribunal to adjudicate the dispute. The **Mahandi Water Disputes Tribunal was constituted in March 2018** as Odisha filed a complaint with the **Ministry of Jal Shakti under Section 3 of the Inter-State River Water Disputes (ISRWD) Act, 1956.**
- It has been asked to determine water sharing among basin states on the basis of: the overall availability of water contribution of each state, the present utilization of water resources in each state and the potential for future development”. The tribunal has been tasked to submit its report by December 2025.

Mahanadi River

- The Mahanadi rises in a pool 6 km from Farsiya village in Chhattisgarh’s Dhamtari district, and falls into the Bay of Bengal close to the temple town of Konark in Odisha’s Puri district.
- The river basin is spread over **Chhattisgarh, Odisha, and small parts of Jharkhand, Maharashtra and Madhya Pradesh.** Some 54.27% of the basin area is agricultural land, and 4.45% is water bodies.

Major Tributaries:

- The **Seonath, the Hasdeo, the Mand and the Ib joins Mahanadi from left** whereas the **Ong, the Tel and the Jonk joins it from right.**

Major Dams/Projects on Mahanadi:

Hirakud Dam:

- This is the longest dam of India. RavishankarSagar, Dudhawa Reservoir, Sondur Reservoir, HasdeoBango and Tandula are other major projects.

Topic 43. ‘FOREIGN LAWYERS CANNOT WORK HERE, YET’

Important for the subject : Polity

The Society of Indian Law Firms (SILF) has submitted a 20-page representation to the

Bar Council of India (BCI), demanding the repeal of the rule allowing foreign law firms and lawyers to practice international arbitration in India.

SILF has expressed concern over the timing of the move and cautioned that it went against the Supreme Court's 2018 judgement. SILF wants the BCI to reject all the applications received from foreign lawyers or firms seeking registration in India.

Areas of Concern

- The Indian legal profession is Important for the subject to the overall jurisdiction of the BCI. But if foreign lawyers commit any professional misconduct, the BCI cannot act against them, because they will be governed by the rules of their home jurisdiction.
- Another area of concern is that Indian law firms can't have more than 20 partners.
- But in **other countries, particularly the UK, rest of Europe, and the US one can even have big corporations.** Now, how can one face this sort of competition, which is creating an unequal playing field.

Moreover, the law must first be amended.

- The SC says **only Indian citizens can practice law in the country and the practice includes not just litigation but all corporate work, transactional work.** The SC judgement has been totally ignored in the bar council's regulations.

About the new rules

- According to the **Advocates Act, advocates enrolled with the Bar Council alone are entitled to practice law in India.**
- All others, such as a litigant, can appear only with the permission of the court, authority or person before whom the proceedings are pending.

Foreign lawyers and law firms can practice in India:

- The notification **essentially allows foreign lawyers and law firms to register with BCI to practice in India** if they are entitled to practice law in their home countries.
- However, the **foreign lawyers or foreign Law Firms have not been permitted to appear before any courts, tribunals or other statutory or regulatory authorities.**
- They are **allowed to practice transactional work /corporate work such as joint**

ventures, mergers and acquisitions, intellectual property matters, drafting of contracts and other related matters on a reciprocal basis.

Same restrictions for Indian lawyers working with foreign law firms:

- Indian lawyers working with foreign law firms will also be Important for the subject to the same restriction of engaging only in non-litigious practice.

Significance

- According to BCI the move would mutually benefit lawyers from India and abroad and the legal fraternity in India would not experience any disadvantage.
- Further, the latest move is expected to address the concerns over the flow of Foreign Direct Investment (FDI) into the country and would help make India a hub for international commercial arbitration.

Bar Council of India

- The Bar Council of India is a **statutory body created by Parliament** under the **Advocates Act, 1961** to regulate and represent the Indian bar.
- It performs the **regulatory function by prescribing standards of professional conduct and etiquette and by exercising disciplinary jurisdiction** over the bar.
- It also sets **standards for legal education and grants recognition to Universities** whose degree in law will serve as qualification for enrolment as an advocate.
- In addition, it performs certain representative functions by protecting the rights, privileges and interests of advocates and through the creation of funds for providing financial assistance to organize welfare schemes for them.
- It consists of **members elected from each state bar council**, and the **Attorney General of India and Solicitor General of India who are ex-officio members** of the bar council. The members from the state bar council are **elected for a period of five years**.
- The **Act provided for the constitution of Bar Council of India, State Bar Councils**, their powers, enrolment, qualification, disqualification of Advocates etc.

State Bar Councils

- The State Bar Councils are **statutory bodies established under Section 3 of the Advocates Act, 1961**.

- These were set up as different councils for the states and union territories of India.
- They act as regulatory bodies, making rules for the legal profession and education in their respective states and also act as the representatives of the advocates of that state, thereby acting in their interests.
- The main functions of the State Bar Councils as specified under Section 6 of the Advocates Act are to act in the interest of the advocates, to bring in legal reform, to regulate the conduct of advocates, to establish funds and to oversee the Legal Education in the respective states among others.
- They work in coordination with and under the supervision of the Bar Council of India, which is a national body established under Section 4 of the Advocates Act, 1961.

Topic 44. GOVERNORS SHOULD CLEAR BILLS AS SOON AS POSSIBLE: SC

Important for the subject : Polity

The Supreme Court observed that bills sent to the governor for assent must be returned “as soon as possible” and not sit over them, making state Legislative Assemblies wait indefinitely.

Key-highlights of SC Observation

- Citing proviso 1 of **Article 200 of the Constitution**, the bench said the expression ‘as soon as possible’ has significant constitutional intent and must be borne in mind by constitutional authorities.
- According to Article 200, “Assent to Bills when a Bill has been passed by the Legislative Assembly of a State or, in the case of a State having a Legislative Council, has been passed by both Houses of the Legislature of the State, it shall be presented to the Governor and the **Governor shall declare either that he assents to the Bill or that he withholds assent therefrom or that he reserves the Bill for the consideration of the President.**”
- The governor is an **important constitutional figure in India**, serving as the representative of the President of India in each state and union territory.

Article 200 of the Indian Constitution

- **Article 200 of the Indian Constitution** provides provisions regarding the powers of the Governor when a bill is passed by the state legislature.

- The Governor shall declare **either that he assents to the Bill or that he withholds assent therefrom or that he reserves the Bill for the consideration of the President.**
- **When a bill other than money bill** is presented before Governor for his assent, he **either gives assent to the bill, withhold his assent to the bill or return the bill for reconsideration of houses.**
- If the bill is **passed again by state legislature with or without amendments, he has to give his assent or reserve the bill for consideration of President.** (Article 201 pertains to ‘**Bills Reserved for Consideration**’)
- The **Governor cannot send money bill back for reconsideration** because the money bill would usually be introduced with prior assent of Governor only. In case the money bill reserved for Presidents assent, the President has to state whether he is giving assent or withholding his assent.
- The **Constitution does not furnish any guidance to the Governor that in which matters he should accord his assent and in which matters he should withhold assent**

Veto Powers of Governor

- **The Governor of India enjoys absolute veto, suspensive veto (except on money bills) but not the pocket veto.**
- **Absolute Veto:** It refers to the power to withhold his assent to a bill passed by the legislature. The bill then ends and does not become an act.
- **Suspensive Veto:** It is used when the bill is returned to the legislature for its reconsideration.
- If the legislature resends the bill with or without amendment, it has to be approved the bill without using any of the veto powers.

Exception:

- Money Bill with respect to suspensive veto
- **Pocket Veto:** The bill is kept **pending for an indefinite period. This power can be exercised by President, but not by the Governor.**

Related Articles

- **Article 355 of the Indian Constitution,** it shall be the duty of the Union to ensure that

the government of every State is carried on in accordance with the provisions of the Constitution.

- **According to Article 154 of the Constitution**, the Governor can exercise his/her executive powers only on the “aid and advice of the Council of Ministers”.
- Thus, the **Governor can withhold assent to a Bill only on ministerial advice**. 12/21 **Key Supreme Court judgments on the issue of justice ability Purushothaman Namboothiri vs. State of Kerala Case, 1962:** In this case, the issue that was discussed was that a Bill pending before the State Governor does not lapse on the dissolution of the Assembly.
- However, this **judgment does not deal with the justice ability of the process of assent**.
- **Hoechst Pharmaceuticals Ltd. And ... vs State Of Bihar And Others Case, 1983:** In this case, the Court ruled that a Governor reserves a Bill for the consideration of the President in the exercise of his discretion.
- However, the **Court cannot determine whether it was necessary for the Governor to reserve the Bill for the consideration of the President** and hence even this case does not deal with the justice ability of assent.

Topic 45. GOVT NOTE SILENT ON ALLEGATIONS, WRESTLERS TO MOVE SC FOR FIR

Important for the subject : Polity

Indian Olympic Association (IOA)

The **Indian Olympic Association (IOA)** or **Indian Olympic Committee (IOC)** is the body responsible for selecting athletes to represent India at the Olympic Games, Asian Games and other international athletic meets and for managing the Indian teams at these events. It plays with the name of **Team India**. It also acts as the **Indian Commonwealth Games Association**, responsible for selecting athletes to represent India at the Commonwealth Games.

History of Indian Olympics

- India first participated in the Olympics in 1900 in Paris. The country was represented by Norman Pritchard, an Anglo Indian who was holidaying in Paris during that time.
- The seeds for creation of an organization for coordinating the Olympic movement in

- India was related to India's participation in the 1920 and 1924 Olympics, when **Sir Dorabji Tata** suggested the need for a Sports body at National level for promoting Olympic Sport in united India. After the 1920 Games, the Committee sending the team to these Games met, and, on the advice of Sir Dorabji Tata, invited Dr. A.G.
- Noehren (Physical Education Director of YMCA India) to also join them. Subsequently, in 1923-24, a provisional All India Olympic Committee was set-up, which organized the **All India Olympic Games** (that later became the National Games of India) in February 1924. Eight athletes from these Games were selected to represent India at the 1924 Paris Summer Olympics, accompanied by manager
 - Harry Crowe Buck. This gave impetus to the development and institutionalization of sports in India, and, in 1927, **the Indian Olympic Association (IOA) was formed**, with **Sir Dorabji Tata** as its founding President and **A.G. Noehren** as Secretary.

Topic 46. STRAY DOG BEATEN TO DEATH; POLICE LAUNCH HUNT TO NAB ACCUSED

Important for the subject : Polity

What is Prevention of cruelty of animal act, 1960

The act **prohibits any person from inflicting, causing, or if it is the owner, permitting, unnecessary pain or suffering to be inflicted on any animal.** The act provides for **punishment for causing unnecessary cruelty** and suffering to animals.

- **Section 2** of the act **defines animals and types of animals** like domestic or captive animals.
- **Section 4** of the act provides for the **Animal Welfare Board of India (AWBI)**, a **statutory advisory body for animal welfare** and protection of animals from unnecessary suffering and pain.
- The act **mentions forms of cruelty, exceptions, and killing of a suffering animal** in case any cruelty has been committed against it, so as to relieve it from further suffering.
- The act also **provides the guidelines** relating to **experimentation on animals for scientific purposes.**

An animal cannot be exhibited or trained by any person, if:

- Such a person is **unregistered as per the provisions** of this chapter; Such an **animal has been barred from being included** in any performance by the Central Government through a notification in the Official Gazette.
- This Act provides for the **limitation period of 3 months** beyond which **no prosecution shall lie for any offences under this Act.**

Topic 47. STAR RATING SYSTEM FOR WATER TAPS

Important for the subject : schemes

The Centre is in the process of bringing in a star rating system for water fixtures similar to the ratings for electrical appliances.

- The **new rating system would have 3, 4 and 5 star water fixtures based on their water efficiency.** This rating system would come **under one umbrella called Bharat Tap.**

Need:

- Data showed that on average over 30% of water can be saved. However, there was not enough data available to assist consumers in making informed decisions when purchasing sanitary fixtures.
- We need to start quantifying how much water is wasted in each activity and how it adds to the overall cost of water.

Star rating system:

- The **Bureau of Energy Efficiency (BEE) has developed a star rating system** for electrical appliances that will help recognise an energy-efficient appliance. The appliance efficiency **ratings are labelled in a range of 1 to 5 stars.**
- An energy star refers to the appliance's energy efficiency, with 1 star being the least efficient and 5 stars being the most efficient.

The Bureau of Energy Efficiency

- The Bureau of Energy Efficiency is a **government agency under the Ministry of Power.**
- It acts as an **intermediary body between the Government, manufacturers and consumers with the goal of energy efficiency.**

- The main goal of this agency is to set norms and standards for energy ratings and act as an enforcement body.
- BEE is also responsible for making consumers aware of the importance of energy efficiency.

Topic 48. INDIA'S HEALTHCARE SECTOR

Important for the subject : government schemes

Why in News?

National Health Account Estimates 2019-20 was released recently. The health account estimates describe the country's total expenditure on healthcare – whether by the government, private sector, NGOs, or individuals – and the flow of these funds. The government spent 1.35% of the country's Gross Domestic Product on healthcare during the year, bouncing back from a slight drop seen in 2018-19 as per the report.

About NHA

- The National Health Account (NHA) estimates for India 2019-20 is the seventh consecutive NHA estimates report prepared by National Health Systems Resource Centre, designated as the National Health Accounts (NHA) Technical Secretariat in 2014 by the Health Ministry.
- The NHA estimates are prepared by using an accounting framework based on the internationally accepted standard of System of Health Accounts, 2011, developed by the World Health Organization (WHO).

Bullets

- Share of Out-of-Pocket Expenditure (OOPE) in Total Health Expenditure declines from 62.6% in 2014-15 to 47.1% in 2019-20.
- Government Health Expenditure's (GHE) share in country's total GDP increases from 1.13% (2014-15) to 1.35% (2019-20).
- Share of Government Health Expenditure in Total Health Expenditure increases from 29% (2014-15) to 41.4% (2019-20).
- Per capita Government spending on healthcare doubles.
- In per capita terms, GHE has doubled from Rs. 1,108 to Rs. 2,014 between 2014- 15 to

2019-20. The government spending on health between 2018-19 and 2019-20 increased by 12%, more than double the growth rate between 2017-18 and 2018-19 which was at 5%.

Figure 1: Government Health Expenditure and Out-of-pocket expenditure as % of Total Health Expenditure (%) (Source: PIB)

- The share of primary healthcare in Current Government Health Expenditure (CGHE) has increased from 51.3% in 2014-15 to 55.9% in 2019-20. The increased focus on primary healthcare reinforces the government's decisions to prioritize primary healthcare in the country.

Figure 2: Share of Primary Health Care in Current Government Health Expenditure (%)
Source: PIB

- The share of Social Security Expenditure (SSE) on health, which includes government-funded health insurance, medical reimbursement to government employees, and social health insurance programs, in THE, has increased from 5.7% in 2014-15 to 9.3% in 2019-20. This increase in social security has a direct impact on reducing out-of-pocket payments.
- State governments urged to move ahead in healthcare spending as percentage of their total budget.
- The report highlights the increased public spending in primary healthcare, which is in line with **National Health policy 2017** where it states that two-thirds of public health spending must be in Primary Health systems. This is also a result of great developments/initiatives taken at grassroot level such as opening of over 1.6 lakh **Ayushman Bharat Health and Wellness Centers (AB-HWCs)** which are providing plethora of health services to the people

Ayushman Bharat – Health and Wellness Centers

- In order to expand access to Comprehensive Primary Health Care (CPHC), under Ayushman Bharat – **Health and Wellness Centers (HWCs)**, **Sub Health Centers (SHCs)** and **Primary Health Centers (PHCs)** are being strengthened as Health and Wellness Centers (HWCs).
- The HWCs are to provide **preventive, promotive, rehabilitative and curative care** for an expanded range of services encompassing reproductive and child health services,

communicable diseases, non-communicable diseases, palliative care and elderly care, oral health, ENT care, and basic emergency care.

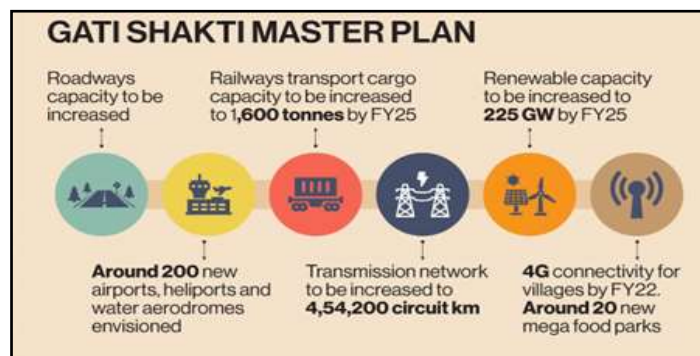
- The services in HWCs will be provided through a **Mid-level Health Care Provider (MLHP)/Community Health Officer (CHO)** placed at a HWC-SHC and Medical Officer at PHC (Rural/Urban).
- The MLHP/CHO will undergo a Certificate in Community Health through IGNOU or public university.

National Health policy 2017

- It intends on gradually increasing public health expenditure to **5% of the GDP**. It proposes free drugs, free diagnostics and free emergency and essential healthcare services in public hospitals. The policy advocates allocating **two-thirds (of resources to primary care)**.
- It proposes two beds per 1,000 of the population to enable access within the first 60 minutes after a traumatic injury.
- To reduce morbidity and preventable mortality of **non-communicable diseases (NCDs)** by advocating pre-screening. It highlights AYUSH as a tool for effective prevention and therapy that is safe and cost-effective.
- It **proposes introducing Yogain** more schools and offices to promote good health. It also proposed reforming medical education.
- The policy also lists quantitative targets regarding life expectancy, mortality and reduction of disease prevalence in line with the objectives of the policy.

Topic 49. VIBRANT VILLAGES PLAN TO BE MERGED WITH PM GATI SHAKTI

Important for the subject : Schemes



The government's flagship **Vibrant Villages Program (VVP)**, which envisages **developing infrastructure and opening up villages along the China border** to tourists, will be **integrated with the Prime Minister's Gati Shakti mega project.**

- One of the key objectives of VVP is to stop the migration of the border population which will help in gathering intelligence from the people of border villages.
- Recently, the Union Cabinet approved the program to cover 2,967 villages in various districts of four States and one UT along the China border and **allocated ₹4,800 crores for the financial years 2023-24, 2024-25 and 2025-26.**
- **The Pradhan Mantri Gati Shakti National Master Plan is a central government project, aimed to revolutionize infrastructure in India.**
- The **digital platform of the PM Gati Shakti initiative brings together 16 Ministries and departments of the Government of India** with an aim to **facilitate integrated planning and coordinated implementation of infrastructure connectivity projects.**
- The **Bhaskaracharya National Institute for Space Applications and Geo-informatics (BISAG-N)** in Gujarat has been assigned the task of providing satellite images and GIS mapping of the projects that will be taken up under the scheme.

Kibithu Village

- **Kibithoo, located in Arunachal Pradesh, is the first village to be part of the Centre's Vibrant Villages program** Kibithu in Anjaw district is in the **easternmost administrative circle in India.**
- **Housing dozens of villages within the 10 km range of the McMohan line,** the villagers are fluent in Hindi because of their regular interaction with the security forces but do not have proper connectivity with the mainland.

Topic 50. 26 STATES AND UTS ADOPTS BHU-AADHAR: DOLR

Important for the subject : Scheme

The **Department of Land Records (DoLR)** has informed **that at least 26 States and UTs have adopted the Unique Land Parcel Identification Number (ULPIN) or Bhu-Aadhar** and seven more States are conducting a pilot test of the project. The Indian government is **aiming to digitize 100 per cent of land records by 2024.**

Bhu-Aadhaar

- The Bhu-Aadhaar or ULPIN is a “14-digit alpha-numeric number generated based on the latitude longitude of the vertices of each land parcel”.
- It is designated to be the “single, authoritative source of truth of information on any parcel of land or property to provide integrated land services to the citizens as well as all stakeholders”.

Other important initiatives for land records

Bhu-Naksha initiative

- The Bhu-Naksha project introduced in 2022 is another project under the Digital India Land Record Modernization Program implemented in 2016.
- The **Bhu-Naksha initiative provisions for mapping boundaries and conducting spatial measurement of land to computerize land records and produce digitized maps of a region with parcels of demarcated land.**
- These maps are editable based on the results of property divisions in G2G (govt to govt) and G2C (govt to citizen) domains.

These parcels of land are then identified by a Bhu-Aadhaar number.

National Generic Document Registration System (NGDRS)

- As many as 28 States and Union Territories (UTs) in the country have adopted the **National Generic Document Registration System (NGDRS).**
- NGDRS is a **digital portal for maintaining land records.**
- The NGDRS is an application developed for allowing people to buy land online via electronic registration of property and documents. The project was initiated by the Department of Land Resources under the aegis of the Ministry of Rural Development.

Topic 51. SUPREME INITIATIVE

Important for the subject : Scheme

Recently, the Union Minister of Science and Technology launched the **SUPREME initiative** to provide financial support for the upgradation and maintenance of analytical

instrumentation facilities (AIFs).

About SUPREME Initiative:

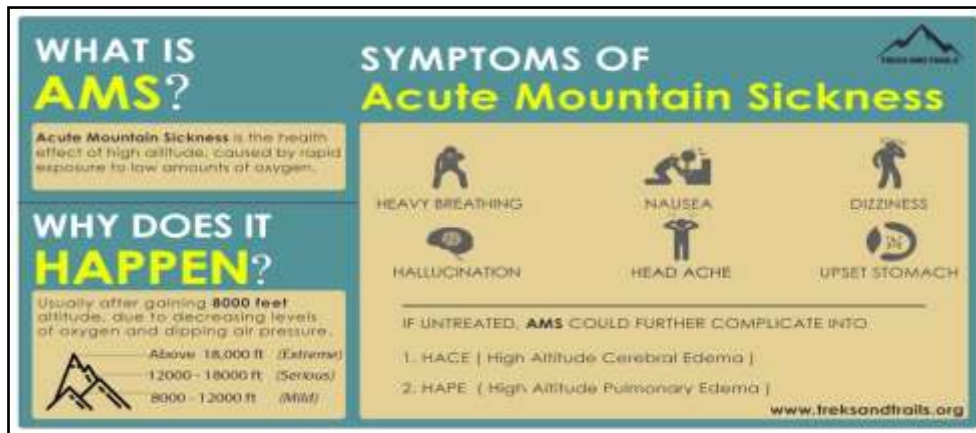
- The **Support for Up-gradation Preventive Repair and Maintenance of Equipment (SUPREME)**, is a first-of-its-kind program by the government.
- It **extends financial support** for repair, up-gradation, maintenance, retrofitting, or acquiring additional attachments to increase the functional capabilities of existing analytical instrumentation facilities.
- **Eligibility:** Different facilities created under the projects/ Analytical instrumentation facilities (AIFs) created earlier from the support of DST, only will be considered for the funding support under this Scheme
- Such facilities at institutions recognized by the University Grants Commission (UGC) are eligible to apply for grants under this initiative. The duration of support **will be for a period not exceeding 3 years.**
- The **funding pattern in the scheme would be 75:25 for all private and govt owned institutions (except for state-funded institutions for which 100% funding would be considered).**

The Criterion for Selection:

- Apart from the academic and research merits of the organizations, details of how the revival of the research facility will benefit the scientific community/MSMEs/Startups will be taken into account for evaluating the proposals.
- Proven records of the sample(s) analysed, publications, patents, different beneficiaries/stakeholders associated with the facility and other parameters like Scientific Social Responsibility/ industrial R&D components will be considered for screening of the proposals.
- The selection process will be through a peer review mechanism and a visit to the organizations, if necessary. Expert Committee will evaluate the proposals and assist DST in making the final selection.

Topic 52. ACUTE MOUNTAIN SICKNESS

Important for the subject: Geography



Anurag is the second Indian to be rescued from Mount Annapurna this week after Baljeet Kaur.

Acute Mountain Sickness

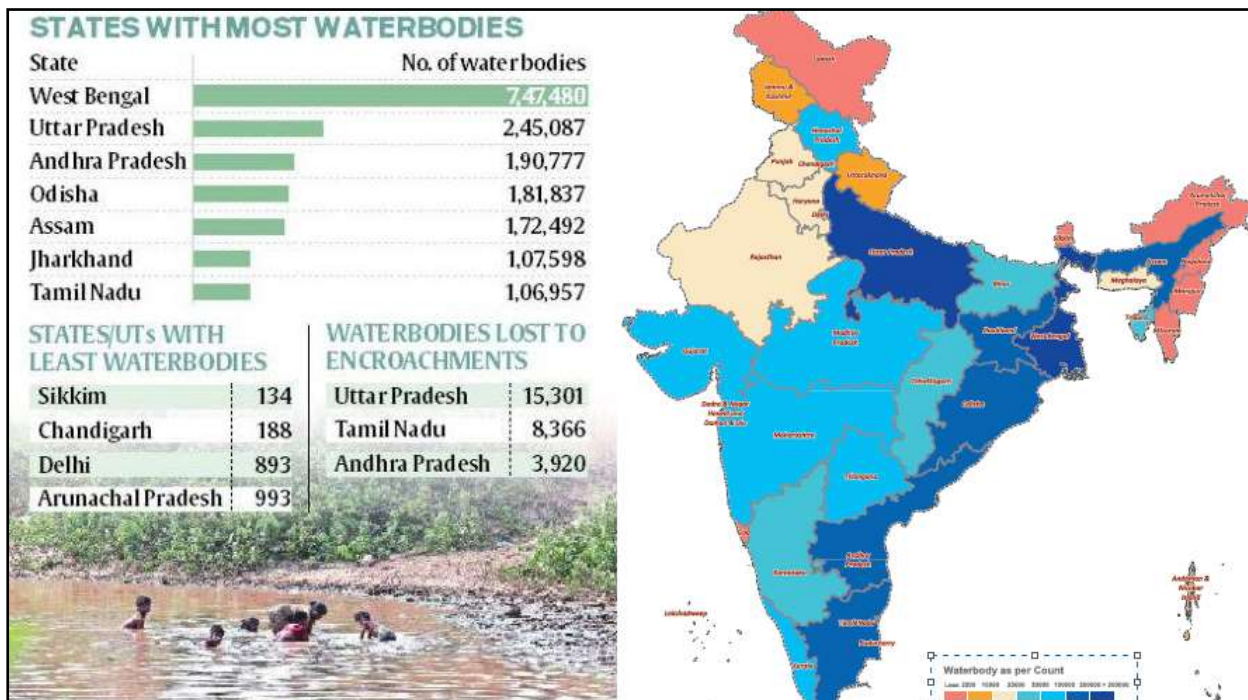
- Acute mountain sickness can occur when a person who is used to being at a low altitude ascends to a higher altitude.
- It is the **most common type of high-altitude illness** and occurs in more than one-fourth of people traveling to above 3500 m (11 667 ft) and more than one-half of people traveling to above 6000 m (20 000 ft). Symptoms include headache, fatigue, poor appetite, nausea or vomiting, lightheadedness, and sleep disturbances.
- In less than 1% of cases, symptoms can progress to **high-altitude cerebral edema**, a life-threatening condition marked by symptoms of wobbly gait, confusion, and decreased consciousness.

Mt. Annapurna

- Mount Annapurna is **situated in the Annapurna Mountain range of Gandaki Province, north-central Nepal**. It is the **tenth highest mountain in the world at 8,091 meters above sea level**. The entire massif and surrounding area are protected within the 7,629-squarekilometre Annapurna Conservation Area.
- It is also known as the **Killer Mountain due to its fatality to summit rate**.

Topic 53. CENSUS OF WATER BODIES

Important for the subject : Geography



Union Ministry of Jal Shakti released the report of its first-ever census of water bodies.

- **First-ever census of water bodies** released has thrown light on the number of water bodies in India and what they are used for.
- The census provides an extensive inventory of water sources in India, highlighting disparities between rural and urban areas and varying levels of encroachment.
- The census has identified 24,24,540 water bodies in India.

About Water body census:

- The census of waterbodies was conducted in conjunction with the 6th Minor Irrigation Census for 2017-18.
- It defines a waterbody as “all-natural or man-made units bounded on all sides with some or no masonry work used for storing water for irrigation or other purposes.”
- The census aimed to provide an inventory of India’s water resources, including natural and man-made water bodies like ponds, tanks, lakes, and more, and to collect data on the encroachment of water bodies.

Key Insights from the Census:

- The census enumerated a total of 24,24,540 water bodies across the country, with **West Bengal accounting for the most (7.47 lakh) and Sikkim the least (134).**

The report reveals that:

- West Bengal has the highest number of ponds and reservoirs. The top district in terms of waterbodies is South 24 Parganas in West Bengal.
- Andhra Pradesh has the highest number of tanks Tamil Nadu has the highest number of lakes Maharashtra leads in water conservation schemes. The report highlights that 97.1% of the waterbodies are in rural areas, with only 2.9% in urban areas.
- **Most of the waterbodies are ponds, followed by tanks**, reservoirs, water conservation schemes, percolation tanks, check dams, lakes, and others.

Encroachment of Waterbodies:

- The census also collected data on the encroachment of waterbodies for the first time, revealing that 1.6% of all enumerated waterbodies are encroached, with 95.4% of encroachments in rural areas and the remaining 4.6% in urban areas.
- A significant percentage of encroachments cover more than 75% of the waterbody's area.

Nodal Ministry: Ministry of Science and Technology

Topic 54. ZERO SHADOW DAY

Important for the subject : Geography

On April 25, **Bengaluru** experienced a 'Zero Shadow Day', when vertical objects appear to cast no shadow.

What is Zero Shadow Day?

- 'Zero Shadow Day' is an **astronomical event** that occurs **twice a year** on specific dates in some parts of the world.
- It is a phenomenon that occurs **when the Sun is directly overhead and the shadows of vertical objects such as poles, trees, and buildings disappear completely** for a brief period of time.

Why does a Zero Shadow Day happen?

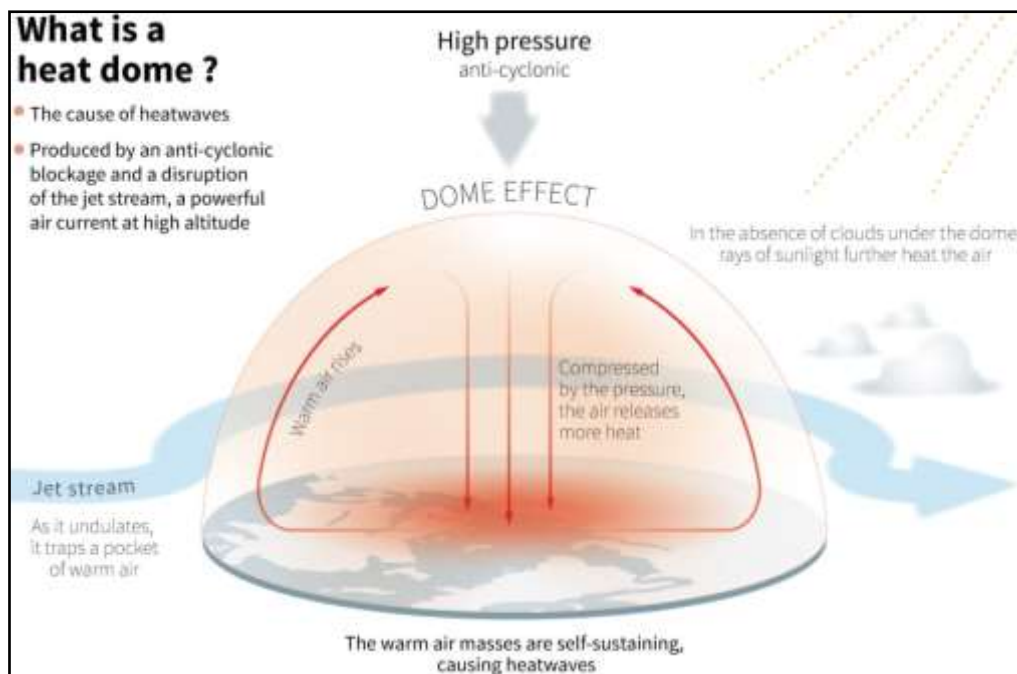
- **Uttarayan** (movement of the Sun from south to north from winter solstice to summer solstice) and **Dakshinayan** (back from north to south) happen because Earth's rotation axis is tilted at an angle of roughly 23.5° to the axis of revolution around the Sun.
- Ramanujam explained that the Sun's location moves from 23.5°N to 23.5°S of Earth's equator and back. All places whose **latitude equals the angle between the Sun's location and the equator on that day experience zero shadow day**, with the shadow beneath an object at local noon.

When does a Zero Shadow Day happen?

- The dates of **Zero Shadow Day vary from place to place**, and the event is more likely to occur near the equator. This **phenomenon lasts for a small part of a second**, but the effect can be seen for a minute to a minute-and-a-half.

Topic 55. HEAT DOME

Important for the subject : Geography



'Heat domes' have also been associated with unusually warm periods in India, Bangladesh, China and some other Asian countries.

More on the News:

- Places across the southwest and eastern parts of the United States **recorded temperatures as warm** as those seen in late June or early July, and the **unusual warming was caused by a phenomenon known as ‘heat domes’**
- ‘Heat domes’ are **natural phenomena** that have also been **associated with unusually warm periods in India, Bangladesh, China** and some other Asian countries. This season’s first heat dome set off heatwaves in as many as 48 states in the US and fears of wildfires loom large.
- Over the years, heat domes have **created some of the most fatal heat waves** in North America, among other regions. **Creating records for some of the highest temperatures ever recorded in the continent**, these waves have caused thousands of deaths.
- Stopping heat domes from forming altogether is not possible, as they are a natural weather phenomenon. But as the **threat of climate change continues to creep up, heat domes are getting more intense.**

Heat Dome:

- A heat dome is a **type of high-pressure system** that forms **over a large area** in the atmosphere, and **causes extremely hot and dry weather conditions**. The system **traps hot air and prevents it from flowing to rise and cool.**
- This air then becomes **compressed and heats up**, leading to a **dome-shaped area** of hot air that can persist for several days or even weeks. Heat domes can **cause dangerous heat waves causing the temperatures to shoot up.**
- **Due to climate change**, heat domes have **not only become more frequent but also a lot more intense**. The rising temperatures and changes in weather patterns are creating conditions that are assisting their formation.

Causes of Heat Dome:

- **Change in Atmospheric Pressure:** Heat waves begin when **high pressure** in the atmosphere moves in and pushes warm air toward the ground.
- High-pressure systems often **bring clear skies, which means there is less reflection of sunlight and more absorption of heat.** Locations with a lot of land and relatively dry air, such as **plains and deserts, serve as a favourable condition** for heat domes to form as

well.

Change in Ocean Temperature:

- In the process known as **convection**, the **gradient causes more warm air, heated by the ocean surface**, to rise over the ocean surface.
- As **prevailing winds move the hot air east**, the **northern shifts of the jet stream trap the air and move it toward land**, where it sinks, resulting in heat waves.
- **Climate Change**: Climate change has **led to warmer background temperatures, exacerbating the high-pressure system**.

Impact of Heat Dome:

- **Heat-related illnesses**: Heat domes can cause a spike in heat-related illnesses such as **heat exhaustion, heat cramps, and heatstroke**. Vulnerable populations such as the elderly, children, and those with pre-existing medical conditions are at a higher risk.
- **Wildfires**: The **high temperatures and dry conditions** caused by heat domes can increase the risk of wildfires. The heat can also **exacerbate the spread of fires**.
- **Crop damage**: Heat domes can **cause crop damage** due to high temperatures and drought conditions. This can **lead to lower crop yields** and economic losses for farmers.
- **Infrastructure damage**: High temperatures can cause damage to infrastructure such as **roads, buildings, and power lines**.
- **Water shortages**: Heat domes can lead to **drought conditions**, which can cause water shortages and impact water supplies for both people and wildlife.
- **Air pollution**: High temperatures can lead to **increased levels of air pollution**, which can exacerbate respiratory problems and other health issues.

Combating Heat Dome:

- **Reducing greenhouse emissions**: **Transitioning to renewable energy sources, improving energy efficiency and promoting sustainable transportation**, can be measures in achieving a reduction of greenhouse gas emissions, as it is critical to mitigating the impacts of heat domes in long terms.
- **Investing in green infrastructure**: Cities can invest in green infrastructure, such as **parks, green roofs, and tree planting**, which can help reduce the urban heat island effect and provide cooling benefits.

- **Implementing building codes and standards:** Building codes and standards can help ensure that new buildings are **designed to withstand extreme heat and maintain indoor comfort during heat waves.**
- **Reducing heat-trapping surfaces:** Cities can take steps to reduce the amount of heat-trapping surfaces, **such as asphalt and concrete**, which can exacerbate the urban heat island effect.
- **Enhancing public education and outreach:** Educating the public about the risks of extreme heat and how to **stay safe during heat waves** can help reduce the incidence of heat-related illness and mortality.

Topic 56. ANCIENT SANSKRIT POETESS SHILABHATTARIKA

Important for the subject : History

Why in News?

Copper plates decoded by **Pune-based Bhandarkar Institute** shed light on celebrated **ancient Sanskrit poetess Shilabhattarika**. A copperplate charter with **five copper plates** said to be dating from the reign of the **BadamiChalukyan ruler Vijayaditya (696- 733 CE)** were brought for decipherment.

The Charter

- The copper plate charter dated from the time of Chalukyan ruler Vijayaditya. The charter had five plates measuring 23.4 cm by 9.4 cm, held together by a copper ring bearing a beautiful varaha (boar) seal.
- The varaha seal is the trademark of the BadamiChalukyas. The charter contained a Sanskrit text of a total of 65 lines inscribed in late-Brahmi script.

Shilabhattarika

- Inscriptions on Pune copper plates establish the poetess as a Chalukyan Princess. Shilabhattarika is the daughter of the Chalukyan ruler Pulakeshin II of Badami (in modern Karnataka), who defeated Harsha.
- Pulakeshin II ruled from 610-642 CE. He defeated Harshavardhan of Kanauj in a battle near the banks of the Narmada River in 618 CE.
- This decipherment revealed Shilabhattarika, as a poetess in the ancient Indian world in

the **heavily male-dominated field of classical Sanskrit literature.**

- The **Sanskrit poet-critic Rajashekhara** (who lived in the **9th-10th century CE**) and was the **court poet** of the **Gurjara-Pratiharas**, has praised Shilabhattacharika for her elegant and beautiful compositions.

Noted **Marathi poetess, ShantaShelke** drawn inspiration from Shilabhattacharika's verse to compose one of her most iconic songs— *tochchandramanabhat*(translated as 'it is the same moon in the sky'). The decoding marks a notable shift in the historiography of Badami Chalukyas by **placing Shilabhattacharika** as having lived in the **7th century CE** rather than the current theory which has her as a wife of the 8th century Rashtrakuta ruler, Dhruva.

King Vijayaditya Donating a Village

- King Vijayaditya, a Chalukyan ruler ruled from **696 CE to 733 CE**. His reign was marked by **general peace and harmony**. He built a number of temples.
- A primary reading of the plates revealed that Vijayaditya had donated the village of **Sikkatteru in the KogaliVishaya** to a Vedic scholar named **Vishnusharma** in the month of *Magha, Shakayear 638*, corresponding to January-February 717 CE.
- Sikkatteru is identified as **Chigateri situated near Kogali in the Vijayanagar district** of Karnataka. The plates revealed that the village was donated **on request by Mahendravarma**, the son of Shilabhattacharika, the daughter of '**Satyashraya**'.
- While other BadamiChalukyan rulers affixed the title of '**Satyashraya**' (translated as "patron of truth") to their names, the **only ruler to be known purely by this title was Pulakeshin II**. Pulakeshin II was the great-grandfather of Vijayaditya.

Other Facts Revealed from the Copper Plates

- The names of **Shilabhattacharika's father-in-law Mokkara** (or Mushkara), and his father **Durvinita** (the most important ruler of the **Western Ganga dynasty** who ruled from 529-579 CE) are also given in the plates.
- Shilabhattacharika was married to **Dadiga**, a prince of the **Ganga lineage of Talakkad**. The most important ruler of the Western Ganga dynasty, Durvinita, was succeeded by Mokkara, who ruled till 604 CE. Dadiga was the son of Mokkara.
- Mokkara was succeeded by Polavira, his eldest son while his **younger son Dadiga**(Shilabhattacharika's husband) was possibly **deputed to Kogali as its governor**. His

son **Mahendravarma** continued in the same position.

BadamiChalukyas, Ganga Dynasty and Pallavas

- The **Gangas** acted as **subordinates to the Chalukyas of Badami** and fought against the Pallavas of Kanchi. Hence Mahendravarma's age was estimated to be above 70 years old when these plates were issued. The **Pallavas** were the **sworn nemesis or arch-rivals** of the BadamiChalukyas, with **Pulakeshin II** being defeated (and possibly killed) in 642 CE in the invasion by the **PallavaNarasimhavarman I**.

The importance of Shilabhattacharika and her poetry

- Over 40 of Shilabhattacharika's verses are said to be still existing.

Rajashekhara, the great 9th-century critic lauds her compositional style.

- According to him, Shilabhattacharika's works adhere to the **Panchali style that calls for a balance of the word with its meaning**.
- In this regard, Rajashekhara even places her **at par with Banabhatta, the court poet of Harsha**.

Literature Lineage of Shilabhattacharika

- It was decoded how Shilabhattacharika might have acquired such a high degree of proficiency in composing poetry, which placed her on an equal footing with the most exalted male poets of the age. **BadamiChalukyas** and the **Western Gangas** were great patrons of literature. Shilabhattacharika's great-grandfather-in-law, **Durvinita** (noted ruler of the Western Gangas), was himself a **proficient composer**, and had **patronisedBharavi**, the author of a classical epic **Kiratarjuniya**. Shilabhattacharika was born in BadamiChalukya family and got married in Western Gangas family. With an illustrious literary pedigree on both sides of her family, it is not surprising that Shilabhattacharika turned out to be a poetess of a high order.

Topic 57. GOLDEN GLOBE RACE

Important for the subject : History



Why in News?

Commander Abhilash Tomy (retd.) created history as the first Indian to complete the Golden Globe Race on April 29, finishing in second place after a gruelling 236 days alone at sea in his sail boat named *Bayanat*. South African sailor Kirsten Neuschafer also became the first woman to win the Golden Globe Race (GGR), a solo, non-stop circumnavigation of the globe without using any modern technological aids, recreating the 1960s on the high seas.

About Golden Globe Race (GGR)

- The historic race is being conducted by the K.'s **Sir Robin Knox Johnston**, to commemorate the world's first solo non-stop circumnavigation undertaken by him in 1968, **onboard the Indian-built boat *Suhaili***.
- Participants in the GGR are required to sail around the world, **single-handed and non-stop**. The uniqueness of the race is that **boat designs and technology newer than 1968 are not permitted**. Also the use of the **Global Positioning System (GPS)**, satellite communication and navigational aids are forbidden in the 30,000 mile journey.
- The sailors each have a **satellite phone** and **emergency locator beacons** to be used for medical emergencies only. Entrants are limited to sailing similar yachts, between 32 ft

and 36 ft, designed prior to 1988 with a full-length keel with a rudder.

- Equipment similar to what was available to Sir Robin in that first race was to be used. 16 sailors from 11 countries depart from **Les Sables-d’Olonne, France**.
- Sail solo, non-stop around the world, via the **five Great Capes** and **return to Les Sables-d’Olonne**.

About Cdr. Abhilash Tommy

- Abilash Tommy is the only Indian to complete a solo, non-stop circumnavigation of the globe in 2012-13, onboard the Indian Naval Sailing Vessel (INSV) Mhadei, covering 53,000 nautical miles under sail.
- The naval veteran had been critically injured in a storm when he competed in the GGR in 2018 and had a spinal injury. The mast of his boat *Thuriya* broke due to extremely rough weather and sea conditions.

Topic 58. REVIVING A ‘DEAD’ RIVER: A CULTURAL EVENT TO CELEBRATE LEGACY OF YAMUNA

Important for the subject : History

Indira Gandhi National Centre for the Arts (IGNCA) will host a cultural program on the banks of the river Yamuna in Delhi, under its special project — Riverine Cultures of India — that began in 2018.

The highlight of the event will be a short festival of films on waterbodies, shot by children from across the country.

- The program will include a photo exhibition comparing the Yamuna of today with what the river was like 50 years ago; symposia on various aspects such as ecology and conservation of India’s rivers and their importance in the country’s heritage; and an exhibition themed on 15 ghats across the country in Sanjhi or paper stencil art. The larger project is focusing on six rivers right now: Ganga, Yamuna, and Sindhu in the north; and Krishna, Godavari, and Cauvery in the south.
- The Yamuna’s confluence with the Ganga and the mythical Saraswati at TriveniSangam in Prayagraj is one of the country’s most important pilgrimage spots for Hindus.

Yamuna – Dead River

- The river had been declared “almost dead” by the Central Pollution Control Board (CPCB) in 2015 citing untreated waste flowing into it from several cities along its banks.
- The **definition of a river is that it must have life, which is measured by its capacity to dissolve oxygen**. The dissolved oxygen content in the Yamuna as it passes through Delhi is zero.

About IGNCA

- The **Indira Gandhi National Centre for the Arts (IGNCA) was established in 1987** as an **autonomous institution under the Ministry of Culture**, as a center for research, academic pursuit and dissemination in the field of the arts.
- The IGNCA has a trust (i.e. Board of Trustees), which meets regularly to give general direction about the Centre’s work. The Executive Committee, drawn from among the Trustees, functions under a Chairman.

It is a **research unit under Project Mausam**.

- **Project ‘Mausam’ is a Ministry of Culture project with Archaeological Survey of India (ASI), New Delhi as the nodal agency.**
- The central themes that hold **Project ‘Mausam’ together are those of cultural routes and maritime landscapes that not only linked different parts of the Indian Ocean littoral, but also connected the coastal centres to their hinterlands.**
- A project on design and development of a **Vedic Heritage Portal** was initiated at IGNCA, under the aegis of the Ministry of Culture, Government of India. The portal aims to communicate messages enshrined in the Vedas.

Topic 59. HYDROGEN TO MASSIVELY GREENIFY STEELMAKING

Important for the subject : Economy

If iron oxide can be heated with hydrogen instead of coke, to remove oxygen, the sector’s carbon emissions could nosedive.

Background:

- **Hydrogen** is a crucial part of **the world’s plans to greenify its manufacturing and**

automobile industries as a fuel whose production and use needn't emit carbon. But in the **steelmaking industry, hydrogen can also be used instead of carbon** in an important chemical reaction **that contributes to 5-7% of the global greenhouse-gas emissions and 11% of carbon dioxide emissions**. That is, if scientists can surmount an old roadblock.

- Researchers in Germany have reported that they may have figured out why **using hydrogen as a reactant in a reaction with iron oxide proceeds more slowly than expected**, a fact that currently renders the element infeasible as a substitute for carbon.

What is the new study's context?

- India is the **world's second-largest steelmaker**, having produced 118.2 million tonnes in 2021. **Making one tonne of steel releases 1.8 tonnes of carbon dioxide**, making the sector's decarbonisation plans an integral part of the country's ability to achieve its climate commitments.
- **Strong steel** consists of a tiny amount – less than 1% – of carbon. To achieve this mix, **iron oxide is heated with coke** (a form of coal with high carbon content) **at 1,700 C inside a blast furnace**. The **carbon reacts with oxygen to form carbon dioxide**, leaving iron with around 4% carbon behind. This iron is **remelted** and oxygen is blown through it, **producing more carbon dioxide** and reducing the amount of carbon in the iron to a desirable level.
- The **blast furnace ironmaking process** is the predominant primary metal production process, with the carbon emissions accounting for approximately 90% of the total value of the entire steelmaking route," a paper published in December 2021 said.

What is the barrier?

- In the first step, **when oxygen leaves the iron oxide**, scientists know that **it leaves behind minuscule pores in the iron**.
- The German team used phase-field models – a mathematical technique that uses partial differential equations to simulate reactions at interfaces – and electron microscopy to find that **when hydrogen is the reactant, the departing oxygen combines with it to form water that becomes trapped inside these pores**. From here, the **water re-oxidizes the iron and considerably slows the oxygen-removal process**.
- The researchers suggested a solution. Some pores on the iron oxide surface were

connected by narrow channels, and they found that the water content in these channels was “almost always” lower than in the pores.

- They hypothesized that the **trapped water drained through these channels**, allowing hydrogen to replace it and continue the oxygen-removal reaction.

How can the barrier be overcome?

- To encourage such channels to be created when the iron oxide is processed, they **proposed that a “microfracture structure” should be created on the feedstock to “increase reduction kinetics and improve metallisation,”** per their paper.
- Creating channels can be achieved by adjusting reduction pressure, temperature, gas composition, and chemical composition or by introducing mechanical deformation to the oxides. This aspect of the research is currently being investigated.
- Currently, multiple hydrogen-based steelmaking technologies are under development. A promising one is shaft furnace hydrogen direct reduction, which uses clean hydrogen as the oxygen-removal agent. With some fine-tuning, it is expected to be able to reduce carbon dioxide emissions by up to 91%.

Topic 60. INDIA RELIANCE ON IMPORTED CRUDE OIL AT RECORD HIGH OF 87.3% IN FY23

Important for the subject : Economy

CRUDE CONSUMPTION (Based on domestic use)		
Financial year	Share of imports (%)	Domestic oil share (%)
2018-19	83.8	16.2
2019-20	85	15
2020-21	84.4	15.6
2021-22	85.5	14.5
2022-23	87.3	12.7

- Rising demand for fuel and other petroleum products amid **flagging domestic crude** oil output has resulted in India’s reliance on imported crude increasing to a record 87.3 per

cent of domestic consumption in 2022-23, up from 85.5 per cent in 2021-22, according to data released by the oil ministry's **Petroleum Planning & Analysis Cell (PPAC)**.

- India's oil import dependency was **4 per cent in 2020-21, 85 per cent in 2019-20, and 83.8 per cent in 2018-19.**
- The computation of the extent of import reliance is based on the domestic consumption of petroleum products and excludes petroleum product exports as those volumes don't represent India's demand. With refining capacity of a little over **250 million tonnes per annum**, India — the **world's third-largest consumer** of crude oil and also **one of its top importers** — is a **net exporter of petroleum products.**
- India's domestic consumption of petroleum products in **2022-23 rose over 10 per cent** year-on-year to a record **3 million tonnes**, underscoring robust demand, particularly for transportation fuels (petrol and diesel). However, domestic crude oil production for the year **declined 1.7 per cent to 29.2 million tonnes**. Crude oil **imports in 2022-23 rose 9.4 percent year-on-year to 232.4 million tonnes**. In value terms, crude oil imports for the fiscal were at **\$158.3 billion, up from \$120.7 billion in 2021-22**, as per PPAC data.
- Total production of petroleum products from domestic crude oil was **2 million tonnes in 2022-23**, which means that the extent of India's self-sufficiency in crude oil was just **12.7 per cent, down from 14.5 per cent in 2021-22**. In 2021-22, consumption of petroleum products sourced from indigenous crude oil was **29.3 million tonnes**, while total domestic consumption was **201.7 million tonnes**.
- While the government wants to reduce India's increasing reliance on imported crude oil, sluggish domestic oil output in the face of growing demand for petroleum products has been the biggest roadblock. Cutting costly oil imports is also a fundamental objective of the government's push for electric mobility, biofuels, and other alternative fuels for transportation as well as industries. Over the past few years, the government has intensified efforts to raise domestic crude oil output by making exploration and production contracts more lucrative and opening vast acreages for oil and gas exploration

Challenge of High reliance on imported crude oil

- It makes the Indian economy vulnerable to **global oil price volatility**, apart from having a bearing on the **country's foreign trade deficit, foreign exchange reserves, rupee's exchange rate, and inflation.**