News Analysis (27 May, 2020)

South Atlantic Anomaly

Why in News

Recently, the **Swarm constellation of satellites** of the **European Space Agency (ESA)** has updated the development of **South Atlantic Anomaly (SAA).**

The South Atlantic Anomaly signifies **weakening of the Earth's magnetic field** between **Africa and South America.**

However, it has been observed that the present dip in intensity of the Earth's magnetic field is **within the normal fluctuation levels.**

Swarm Constellation Mission

- Swarm is European Space Agency's **first** constellation of satellites for **Earth observation.**
- It consists of three satellites designed to identify and precisely measure the **different magnetic signals** that **make up Earth's magnetic field.**
- The mission is operated by ESA's European Space Operations Centre (ESOC), in **Germany,** via the primary ground station in **Kiruna, Sweden.**

Earth's Magnetic Field

- **Description:**
  - Earth's magnetic field, or the geomagnetic field, is the magnetic field that extends from the Earth's interior out into space exerting a force on the charged particles emanating from the Space including Sun.
  - The earth's south magnetic pole is actually near the North Pole and the magnetic north pole is near the South Pole. This is why a compass magnet's north pole actually points north (Since opposite poles attract each other).
- **Reasons for Presence:**
  - The magnetic field of the Earth is due to the **metallic and liquid outer core** of the planet.
  - The outer core of the planet is like a **giant dynamo.** The **rotation of the Earth** creates **movements inside the liquid outer core** which gives rise to the geomagnetic field.

- **Significance:**
    - It creates electric currents that generate and change our electromagnetic field.
    - The Northern Lights in the Polar Regions are caused by the magnetic field of Earth – the energy particles emitted by the Sun are channelled by the Earth's magnetic field towards the poles, where they interact with the atmosphere to create the **aurora borealis.**
    - The Earth's magnetic field also plays an important role in **protecting the planet from solar winds and cosmic radiation that are harmful.**

Key Points

- **Intensification of SAA (Weakening of Magnetic Field):**
    - Scientists have discovered that Earth's magnetic field has **lost** around **9%** of its strength over the **last 200 years.**
    - Further, the strength of the field has **dropped** from around **24,000 nanoteslas to about 22,000 nanoteslas** between **1970 and 2020.**
    - It has also observed an **intensified weakening** of magnetic fields in the **southwest of Africa.** The **eastern minimum** of the South Atlantic Anomaly has appeared over the last decade and has been **developing vigorously.** This scenario indicates that the South Atlantic Anomaly **could split** into **two separate low points.**
- **Significance of SAA:**
    - It has been speculated that the current weakening of the field is a **sign of the pole reversal of the earth–** in which the north and south magnetic poles may switch places.
        Pole reversal is not an uncommon event and it takes place every 250,000 years. Last it had happened 7.8 lakh years ago.
    - Additionally, the SAA is expected to help to understand the **processes in Earth's core** and future developments in the earth's interior.
- **Implications:**
    - At **surface level,** the South Atlantic Anomaly presents **no cause for alarm.** It means that people won't feel the change even if the pole shift happens.
    - However, **satellites and other spacecraft flying through the area** are more likely to experience **technical malfunctions.** The weaker magnetic field in this region may force charged particles to penetrate the altitudes of low-Earth orbit satellites.
    - It may also affect the **navigation-mapping, telecommunication and satellite systems** which rely on the geomagnetic field. Therefore, computers, mobile phones and other devices could also face difficulties.

Way Forward

- Earth's magnetic field is often visualised as a powerful dipolar bar magnet at the centre of the planet, tilted at **around 11° to the axis of rotation.** However, the growth of the South Atlantic Anomaly indicates that the processes involved in **generating the field are far more complex.**
- The magnetic field observations from the Swarm satellite are also expected to provide the new insights into the scarcely understood processes of Earth's interior.

Source:BL

Misuse of Criminal Defamation Law: Madras HC

Why in News

Recently, the **Madras High Court** has held that public servants and constitutional functionaries cannot be allowed to **misuse the law of criminal defamation** by using the State as a tool to initiate defamation proceedings against adversaries.

Key Points

- **Quashed Cases:**
  - The HC **quashed criminal defamation proceedings** launched by the **Madras state government against a host of media houses and journalists,** during Jayalalithaa's tenure as Chief Minister in 2012 and 2013.
  - It was cleared out that the publications in the newspapers were **factual news** and the **quoted statements** of the politicians.
  - There was **no criminal defamation** in the case as the newspapers had not made any personal imputation against anyone.
  - However, some media houses **can be prosecuted** by the aggrieved, in their **individual capacity,** before a **Judicial Magistrate** under **Section 199 (6) of Code of Criminal Procedure** but **not before a Sessions Court** since no defamation against the State had been made out.
- **Observations of the Judgement:**
  - **For States:**
    - They cannot use criminal defamation cases to throttle democracy.
    - Public servants and constitutional functionaries **must be able to face criticism** since they owed a solemn duty to the people.
    - States should **act as a parent of all its citizens** when it comes to the invocation of the law of defamation and **laws cannot be misused** by **using the State as a tool** to settle personal adversaries.
    - An individual or a public servant/constitutional functionary can be impulsive but not the **State which will have to show utmost restraint and maturity** in filing criminal defamation cases.
  - **For Public Prosecutors:**
    - They should **apply their mind independently** before filing criminal defamation cases on behalf of the State and launching prosecutions.
    - They should **not exhibit blind eagerness to grasp a conviction** and should conduct a case with utmost fairness.
  - **For Trial Courts:**

    They should **rely on materials available on record** and issue summons to the accused only if they were satisfied that the ingredients required for taking cognisance of a criminal defamation complaint against the State had been made out.
  - **For Newspapers and Media Houses:**
    - The role of a newspaper is **only to publish news as it had happened.**
    - If political personalities or constitutional functionaries disagree with the information provided, they **can refute** the allegations by a counter-press statement.

Defamation

- In India, **defamation** can both be a **civil wrong** and a **criminal offence.**
    - The **difference** between the two lies in the **objects they seek to achieve.**
    - A civil wrong tends to provide for a **redressal of wrongs by awarding compensation** and a criminal law seeks to **punish a wrongdoer and send a message** to others not to commit such acts.
- In Indian laws, **criminal defamation** has been specifically defined as an offence under the **section 499 of the Indian Penal Code** (IPC) whereas the **civil defamation is based on tort law** (an area of law which does not rely on statutes to define wrongs but takes from ever-increasing body of case laws to define what would constitute a wrong).
- Section 499 states defamation could be **through words,** spoken or intended to be read, **through signs,** and also **through visible representations.**
    These can either be published or spoken about a person with the intention of damaging the reputation of that person, or with the knowledge or reason to believe that the imputation will harm his reputation.
- **Section 499 also cites exceptions.** These include **"imputation of truth"** which is required for the "public good" and thus has to be published, on the public conduct of government officials, the conduct of any person touching any public question and merits of the public performance.
- **Section 500 of IPC,** which is on **punishment for defamation,** reads, "Whoever defames another shall be punished with simple imprisonment for a term which may extend to two years, or with fine, or with both."
- Moreover, in a **criminal case,** defamation has to be **established beyond reasonable doubt** but in a **civil defamation suit,** damages can be awarded **based on probabilities.**
- The **Supreme Court of India**, in the ***Subramanian Swamy vs Union of India, 2014,*** **upheld the constitutional validity** of the criminal defamation law.

Source: TH

Wildfires in Uttarakhand

Why in News

With rising mercury levels, **Uttarakhand's forest fire** season has now reached its peak.

Key Points

- A wildfire is an **unplanned fire** that is often caused by **human activity** or a **natural phenomenon** such as lightning, and they can happen at any time or anywhere.
- Wildfires occur in every continent **except Antarctica.**

- There are **two primary causes** of wildfires, viz. Human and Natural.
    - **Human Causes**
        - 90% of all wildfires are caused by humans.
        - Human acts of carelessness such as leaving campfires unattended and negligent discarding of cigarette butts result in wildfire disasters every year.
        - Accidents, deliberate acts of arson, burning of debris, and fireworks are the other substantial causes of wildfires.
    - **Natural Causes**
        - **Lightning:** A fairly good number of wildfires are triggered by lightning.
        - **Volcanic Eruption:** Hot magma in the earth's crust is usually expelled out as lava during a volcanic eruption. The hot lava then flows into nearby fields or lands to start wildfires.
        - **Temperature:** High atmospheric temperatures and dryness offer favourable conditions for a fire to start.
        - **Climate Change** is causing a gradually increasing surface air temperature, which can propagate forest fires.
        - **Weather Components:** Warmer temperatures and lower humidity cause vapour pressure deficit to increase which can dry fuels rapidly and allow fires to grow very fast
- There are **three basic types of forest fires:**
    - **Crown fires** burn trees up their entire length to the top. These are the most intense and dangerous wildland fires.
    - **Surface fires** burn only surface litter and duff. These are the easiest fires to put out and cause the least damage to the forest.
    - **Ground fires** (sometimes called underground or subsurface fires) occur in deep accumulations of humus, peat and similar dead vegetation that become dry enough to burn. These fires move very slowly, but can become difficult to fully put out, or suppress.

Forest Fire Prevention and Management in India

- Forests are a subject in the **concurrent list (brought under this list through 42nd Constitutional Amendment Act, 1976)** of the Seventh Schedule of the Indian Constitution.
- **National Action Plan on Forest Fires (NAPFF-2018)** of Ministry of Environment, Forest and Climate Change (MoEFCC).
    - MoEFCC also provides forest fire prevention and management measures under the **Centrally Sponsored Forest Fire Prevention and Management (FPM) scheme.**
    - The FPM **replaced the Intensification of Forest Management Scheme (IFMS)** in **2017.** By revamping the IFMS, the FPM has **increased the amount dedicated for forest fire work.**
    - Funds allocated under the FPM are according to a center-state cost-sharing formula, with **a 90:10 ratio of central to state funding** in the Northeast and Western Himalayan regions and a **60:40 ratio for all other states.**
    - It also provides the states the flexibility to direct a portion of the **National Afforestation Programme (NAP)** and **Mission for Green India (GIM)** funding toward forest fire work.

Way Forward

- Forest fires are among major disasters faced by India leading to massive loss of life and property and impact on the environment.

- A holistic approach of management of forest fires through prevention, mitigation and control can lead to better outcomes saving natural resources and loss of life and property.

Source: ToI

Locusts and Urban Areas

Why in News

Over the last few days, **swarms of locusts** have been sighted unusually even in urban areas of Rajasthan.

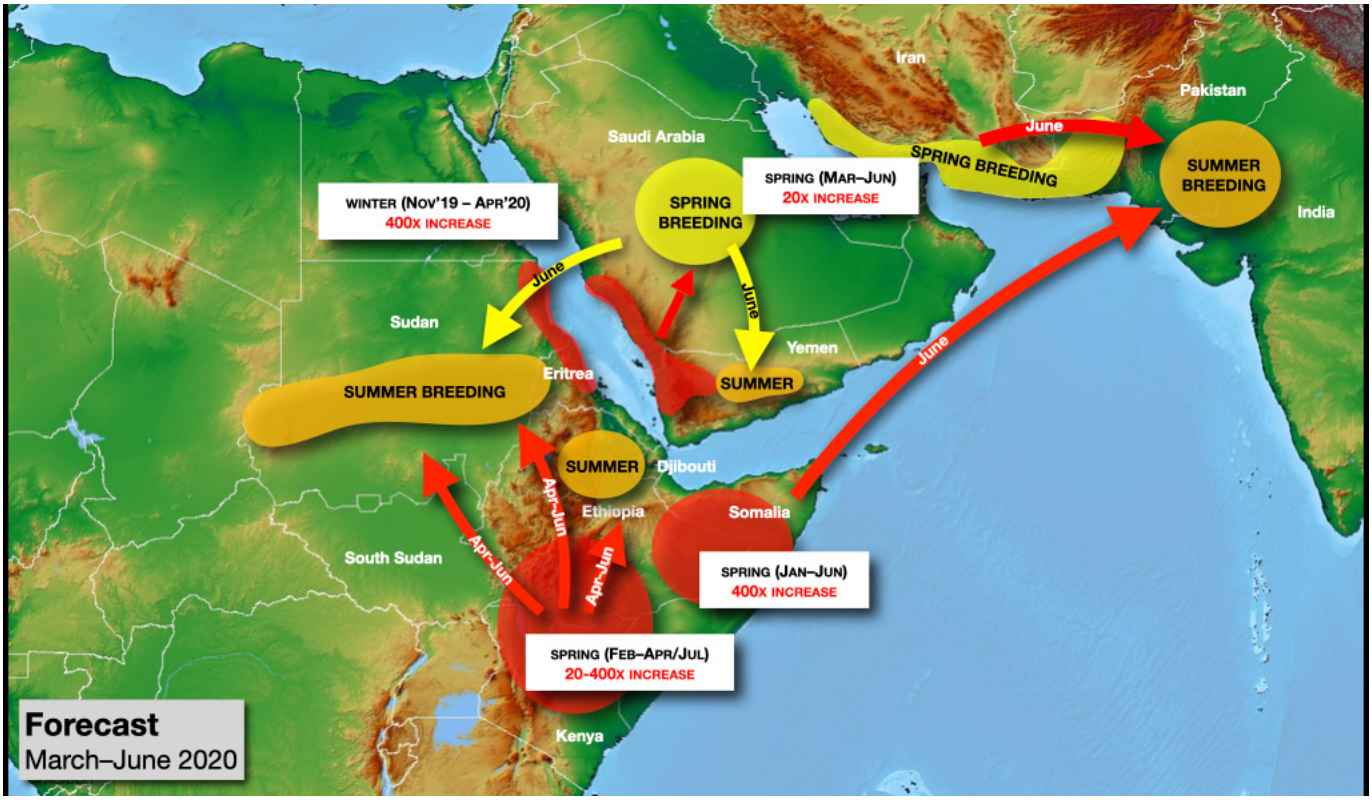
> Swarms have also been reported from parts of Madhya Pradesh and Vidarbha region of Maharashtra.

Key Point

- The **desert locust *(Schistocerca gregaria)*** is a short-horned grasshopper.
- Harmless when solitary, locusts undergo a behavioural change when their population builds up rapidly.
- They enter the **'gregarious phase'** by forming huge swarms that can travel up to 150 km per day, eating up every bit of greenery on their way.
- These insects feed on a large variety of crops.
    - If not controlled, locust swarms can threaten the food security of a country.

Early Arrival

- The first swarms were sighted along the India-Pakistan border on April 11, months ahead of the usual time of arrival.
    - In India, locusts are normally sighted during July- October along the Pakistan border.
- **Reason for early arrival**
    - This can be traced back to the **cyclonic storms Mekunu** and **Luban** that had struck **Oman and Yemen** respectively in 2018.
    - These turned large deserts tracts into lakes, **facilitating locust breeding** that continued through 2019.
    - Swarms attacking crops in **East Africa** reached peak populations from November, and built up in southern Iran and Pakistan since the beginning of 2020, with heavy rains in East Africa in March-April enabling further breeding.



Locusts and Urban Areas

- Locusts are being seen in urban areas not historically associated with their sightings, such as — Jaipur, MP's Gwalior, Morena and Sheopur, and recently stray swarms in Maharashtra's Amravati, Nagpur and Wardha.
- There being no crops in the fields, the locusts have moved across states attracted by green cover in search of food.

    The swarms were **aided by high-speed wind** and thus they made their way to such **urban areas.**

Impact on Crops

- At present, chances of crop damage are low given that farmers have **already harvested their rabi crop.**
- Orange growers in Maharashtra have expressed concern but as per scientists of the Agriculture Ministry's **Locust Warning Organization (LWO)**, the swarm in Maharashtra would be easy to control.
- The bigger problem will come once the present swarms breed. An adult female locust lays 80-90 eggs thrice in her three-month life cycle.
    - If left uncontrolled, a swarm can grow exponentially to 40-80 million locusts per square kilometre.
    - The locusts will start laying eggs after the monsoon starts and continue breeding for two more months, with newer generations rising during the growth phase of the kharif crop.

Control Measures

- Control involves spraying insecticide on locusts' night resting places like trees.
- Till date, the LWO has carried out spraying over 21,675 hectares in Rajasthan. India has also put an order of 60 specialised insecticide sprayers with the UK, the country already has 50 such machines.
- Drones will also be used to spray the resting places.

Way Forward

- At a time India is battling Covid-19, there is a need to take measures so that it won't pose a threat to food security.
- There is no quick-fix solution to the locust menace. Beyond chemicals, pesticides, and drones, it is imperative to tackle the root cause of global warming and invest in upgrading climate resilience and adaptation techniques. An expensive and complex process, this will require global cooperation and coordination.

Source: IE

Antarctic Impulsive Transient Antenna: ANITA

Why in News

Recently, NASA's **Antarctic Impulsive Transient Antenna (ANITA)** has detected the unusual **upward movement** of neutrinos in Antarctica.

- Instead of the high-energy neutrinos streaming in from space, they seem to have come from the Earth's interior, before hitting the detectors of ANITA.
    Usually, the high-energy particles move top to bottom (i.e. from space to the earth). However, ANITA has detected an anomaly i.e. particles have been detected travelling bottom to top.
- **Earlier, researchers had also located a deep-space source for high-energy neutrinos** through the **Ice Cube Neutrino Observatory** at a U.S. scientific research station at the South Pole in **Antarctica.**
    The India-based Neutrino Observatory (INO) is located at the **Bodi West Hills region** in Theni District of **Tamil Nadu.**

Antarctic Impulsive Transient Antenna

- **Antarctic Impulsive Transient Antenna (ANITA)** is a radio telescope instrument to detect **ultra-high energy cosmic-ray neutrinos** from a scientific balloon flying over the continent of Antarctica.
    - It involves an array of radio antennas attached to a helium balloon which flies over the Antarctic ice sheet at 37,000 meters.
    - At such a height, the antennas can listen to the cosmos and detect high-energy particles, known as neutrinos, which constantly bombard the planet.
- It is the **first NASA observatory for neutrinos** of any kind.

- ANITA detects neutrinos pinging in from space and colliding with matter in the Antarctic ice sheet through the **Askaryan effect.**
    - The Askaryan effect is the phenomenon whereby a particle **traveling faster** than the phase velocity of light in a **dense dielectric** (such as salt, ice or the lunar regolith) produces a shower of secondary charged particles.
        - When neutrinos smash into an atom, they produce a shower of detectable secondary particles.These detectable secondary particles allow us to probe where they came from in the universe.
        - However, neutrinos pose no threat to human beings and pass through most solid objects. Additionally, they rarely do interact with matter.
    - It is named after Gurgen Askaryan, a Soviet-Armenian physicist who postulated it in 1962.

Neutrinos

- Neutrinos are **electrically neutral, undisturbed** by even the strongest magnetic field, and **rarely interact with matter.** The direction from which they arrive points directly back to their original source.
- Neutrinos are produced during natural radioactive decays and all sorts of nuclear reactions in nuclear power reactors, particle accelerators or nuclear bombs.
- However, the most common sources of neutrinos are celestial phenomena i.e. the birth and death of stars, collisions, and explosions happening in space.

Way Forward

- The ANITA experiment has definitely detected something unusual and unexpected about neutrinos but there are many competing theories about it. There are a number of potential candidate particles that could account for the results from ANITA.
- Further, there are so many unknown properties about neutrinos that astrophysicists and scientists are still trying to unravel.
- It contemplates that there is new physics out there to be found which will help to study the origin of the universe and big bang theory in the future.

Source:BL

Arogya Setu App: An Open Source

Why in News

Recently, the source code of Aarogya Setu Mobile App has been made open source for software developers.

> It has been uploaded on GitHub which will help in identifying any vulnerabilities or code improvement in order to make Aarogya Setu more robust and secure.

Background

- India launched **Aarogya Setu mobile App** to augment the efforts of limiting the spread of **Covid-19.**
- It has an objective of **enabling bluetooth based contact tracing** and mapping of likely hotspots and dissemination of relevant information about Covid-19.
- Although the app has been resourceful by its users, there were **privacy concerns** regarding the lack of transparency in the app's code.
- To address these concerns, the government has decided to launch the code-set of the **app on GitHub to make it more transparent.**

Key Points

- **Arogya setu as an open source: Open Source** refers to a source which people can modify and share because its design is publicly accessible.
  Source code is the part of software that computer programmers can manipulate its working and function. Programmers who have access to a computer program's source code can improve that program by adding features.
- **Significance:** Expanding collaboration amongst the talented youth and citizens through open source would help in building a robust and secure technology solution which will further support the work of frontline health workers in fighting this pandemic together.
- Towards this objective, the **National Informatics Centre** has also launched a **Bug Bounty Programme**
- **Challenges:** Releasing the source code of a rapidly evolving product that is being used by million users would require regular maintenance of the source code.
  Regular updates in the app with the new technology would also be a concern.

Bug Bounty Programme

- It has a goal to partner with security researchers and Indian developer community to test the security effectiveness of Aarogya Setu and also to enhance its security and build user's trust.
- It is aimed at encouraging the Indian developer community to find security flaws in the app and get rewarded Rs 1 lakh.

Way Forward

The availability of the App as an open code would help in the development of a transparent mechanism of availing data from the public regarding the Covid-19. It would address the privacy issue by enabling a robust system in the App by adding new features to it.

Source: PIB

Fabrication of Controlled Nanostructures

Why in News

Recently, the researchers at the **Institute of Nano Science and Technology** (INST) **Mohali** have found a route to fabricate precisely controlled nanostructures of desired geometry and location on 2D materials, through a rapid one-step low power laser writing process.

INST, Mohali is an **autonomous institute** under the **Department of Science and Technology** (DST).

Key Points

- INST developed a **hybrid Surface-Enhanced Raman Spectroscopy** (SERS) **platform of Molybdenum disulfide** (MoS2, an inorganic compound) **nanostructure** decorated with **gold NanoParticles** (AuNPs).
    - SERS is a **commonly used sensing technique** in which inelastic light scattering by molecules is greatly enhanced when the molecules are adsorbed onto corrugated metal surfaces such as silver or gold nanoparticles (NPs).
    - It enhances the Raman scattering light from molecules, thus leading to effective analysis of the molecules.
- **Direct laser writing** (3D printing for microscopic world) was used to engineer the artificial edges on the surface of MoS_2 which **created localized hotspots with precision and control.**
    - A focused laser beam of meagre power of a **conventional Raman spectrometer** was used which enables the superior deposition of AuNPs along the artificial edges.
    - Nanostructuring was done on the 2D MoS_2 sheet.
- The hybrid SERS platform offers **controlled formation of localized hotspots for ultrasensitive and reproducible detection of analytes** (substances whose chemical constituents are being identified and measured).
- **Significance:**
    - This research will open a new avenue for the development of commercialized **SERS substrates** (a silicon wafer coated with a metal like gold or silver) with a localized detection capability of analytes.
        > SERS detection has been emerging as a powerful **tool for the detection of a variety of analytes** due to its very **high sensitivity and fingerprinting recognition capabilities.**
    - This will also shed new light in the SERS sensing of biological and chemical molecules.
    - The technology can be used in combination with an antibody for the spectroscopic detection of various **biomarkers** (an objective measure that captures what is happening in a cell or an organism at a given moment).

Raman Effect

- It is a phenomenon in **spectroscopy** discovered by the eminent **physicist Sir Chandrasekhara Venkata Raman** on **28th February 1928.**
    > In his honour, 28th February is celebrated as **National Science Day** in India.
- In **1930,** he got a **Nobel Prize** for this remarkable discovery and this was the **first Nobel Prize for India in the field of Science.**

- Raman effect is the **inelastic scattering of a photon by molecules** which are excited to higher vibrational or rotational energy levels. It is also called **Raman scattering.**
    - In simpler words, it is a **change in the wavelength of light that occurs when a light beam is deflected by molecules.**
    - When a beam of light traverses a dust-free, transparent sample of a chemical compound, a small fraction of the light emerges in directions other than that of the incident (incoming) beam.
    - Most of this scattered light is of unchanged wavelength. A small part, however, has wavelengths different from that of the incident light and its presence is a result of the Raman Effect.
- The Raman effect **forms the basis for Raman spectroscopy** which is used by chemists and physicists to **gain information about materials.**

    Spectroscopy is the study of the interaction between matter and electromagnetic radiation.

Source: PIB

Neutralising Antibodies Against Covid-19

Why in News

Recently, a study conducted on the hospital staff in France has shown that **almost all doctors and nurses who got mild forms of Covid-19 have produced antibodies that can prevent reinfection.**

> Almost all of the staff tested had antibodies that were **capable of neutralizing the novel coronavirus.**

Key Points

- **Findings of the Study:**
    - Antibodies against novel coronavirus were detected in virtually all hospital staff, sampled 13 days after the symptoms started.
    - **Neutralising antibodies** were found in 91% of the individuals.
        - After an infection, it takes some time for the host to produce neutralising antibodies.
        - These are a type of antibody that is capable of keeping an infectious agent (for instance, a virus) from infecting a cell by neutralizing or inhibiting its biological effect.
        - An antibody is a protective protein produced by the immune system in response to the presence of a foreign substance, called an antigen.
    - The study also revealed that patients may get **protective immunity** against the virus.
- **Protective Immunity:**
    - It is a condition of developing the protection against infectious disease conferred either by the immune response generated through immunization, previous infection or by other factors.
    - Several evidence suggest that the presence of neutralising antibodies may be associated with protective immunity for Covid-19 infection.

- **Supports Serologic Testing:**
    - The study supports the use of **serologic testing** for the diagnosis of individuals who have recovered from Covid-19 infection.
        Currently, serologic response of individuals with mild forms of Covid-19 infection is poorly characterised.
    - **Serologic Tests:**
        - Serology tests are **blood-based tests** that can be used to identify whether people have been exposed to a particular pathogen by looking at their immune response.
        - It measures the amount of antibodies or proteins present in the blood when the body is responding to a specific infection.
        - These tests can also give greater detail into the prevalence of a disease in a population by identifying individuals who have developed antibodies to the virus.

Way Forward

- Currently, there's no specific treatment or vaccine for the coronavirus disease.
- The findings may help scientists better understand Covid-19, including whether people who have recovered from the coronavirus infection, particularly milder forms, develop antibodies against the virus.
- Further, there is a need of future studies to characterise the beneficial or detrimental role of specific antibodies in Covid-19 patients.

Source: TH

Banks Board Bureau

Why in News

The **Banks Board Bureau (BBB)** has selected SN Rajeswari as the Chairman and Managing Director (CMD) of the Delhi-based Oriental Insurance Company (OIC).

- The Ministry of Finance will now start the process of appointing Rajeswari as the CMD of OIC.
- This will be followed by the Finance Ministry's nod and a further approval from the **Appointments Committee of the Cabinet** and the Prime Minister's Office.

Key Points

- **Background:** The Banks Board Bureau (BBB) has its genesis in the recommendations of **'The Committee to Review Governance of Boards of Banks in India, May 2014 (Chairman - P. J. Nayak)'.**

- **Formation:** The government, in 2016, approved the constitution of the BBB as a body of eminent professionals and officials to **make recommendations for appointment of whole-time directors as well as non-executive chairpersons of Public Sector Banks (PSBs)** and state-owned financial institutions.
    - It is an **autonomous recommendatory body.**
    - The Ministry of Finance takes the final decision on the appointments in consultation with the Prime Minister's Office.
- **Functions:**
    - Apart from recommending personnel for the PSBs, the Bureau has also been assigned with the task of recommending **personnel for appointment as directors in government-owned insurance companies.**
    - It engages with the board of directors of all the public sector banks to formulate appropriate strategies for their growth and development.
    - It is tasked with improving corporate governance at public sector banks, building capacities, etc.
- The Banks Board Bureau is a **public authority as defined in the Right to Information Act, 2005.**

Source: IE

Chardham Pariyojana

Why in News

The **Border Roads Organisation (BRO)** has completed **construction of a 440 m long tunnel below the Chamba town** on the Rishikesh-Dharasu road highway (National Highway - 94).

> The construction of the tunnel is a **part of the Chardham Pariyojana.**

Key Points

- It is a programme taken up by the Ministry of Road Transport and Highways for connectivity improvement for **Chardham** (Kedarnath, Badrinath, Yamunotri and Gangotri) in Uttrakhand.
- The cost of the project is around Rs. 12,000 Crore.
- It envisages improvement as well as development of 889 km length of national highways.
- **Implementing Agencies:** Uttarakhand State Public Works Department (PWD), BRO and the National Highway & Infrastructure Development Corporation Limited (NHIDCL).
- **Project Mode:** The work under the programme is being implemented on **Engineering, Procurement and Construction (EPC)** mode.
    - Under the EPC mode, the **project cost** is completely borne by the government.
    - However, the contractor is directly responsible for **ensuring quality of the work** as well as rectification of defects and maintenance of the project stretch for a period of 4 years after completion of construction.

Border Roads Organisation

- It was conceived and **raised in 1960 by Pandit Jawaharlal Nehru** for coordinating the speedy development of a network of roads in the North and the North Eastern border regions of the country.
- It works under the **administrative control of the Ministry of Defence.**
- It has diversified into a large spectrum of construction and development works comprising airfields, building projects, defence works and tunneling and has endeared itself to the people.

Source: PIB
