News Analysis (28 Oct, 2020)

India-USA 2+2 Dialogue 2020

Why in News

Recently, India and the USA have concluded the **3rd India-USA 2+2 dialogue** in New Delhi.

- The **USA reiterated its support to India** in **defending its territorial sovereignty** in the background of the ongoing **standoff between India-China.**
- It also referred to the greater **threats posed by China in the Indo-Pacific region** and by the **Covid-19 pandemic** in general.
- The **first two rounds** of these dialogues between both the countries were held in **2018 and 2019.**

Key Points

- India has signed the **Basic Exchange and Cooperation Agreement** (BECA) with the USA.
    - BECA will enable the **exchange of geospatial data and information** between the two countries and will **improve the accuracy of India's missiles** in precision strikes.
    - The geospatial maps and charts to be shared, will be **acquired from multiple sources** like satellites, unmanned aerial vehicles (UAVs), reconnaissance aircraft, aerostats among others.
    - As part of measures to enhance military to military cooperation, Liaison Officers at each other's establishments could be leveraged to enhance information sharing.
    - BECA is one of the **four foundational military communication agreements between the two countries.** The **other three** are:
        - General Security Of Military Information Agreement.
        - Logistics Exchange Memorandum of Agreement.
        - Communications and Information Security Memorandum of Agreement.
- Both countries released a **Joint Statement on shared Indo-USA goals in the Asia-Pacific region** and emphasised that the **Code of Conduct in the South China Sea** should not prejudice the legitimate rights and interests of any nation in accordance with international law.

    They also decided to **expand joint capacity building activities** with partner countries in the **Indo-Pacific region.**
- **Other Steps Taken:**
    - **Memorandum of Understanding** (MoU) on **Technical Cooperation in Earth Observations and Earth Sciences.**
    - Agreement to **extend the duration** of the **MoU on the Global Center for Nuclear Energy Partnership.**
    - **Agreement on the electronic exchange of customs data.**
    - **Letter of intent regarding cooperation in traditional Indian medicines.**
    - **Discussions on the status of Afghanistan** and support for its peace process.

'2+2' Dialogue

- 2+2 Ministerial is the **highest-level institutional mechanism** between the two countries.
- It is a **format of dialogue** where the defence/foreign ministers or secretaries meet with their counterparts from another country.
- India holds such talks with **Australia, Japan and the USA.**

Way Forward

- The signing of BECA is a significant achievement for India as it is a sign of the USA accepting the Indian request for cooperation in the advanced field of maritime domain awareness.
- India-USA's national security convergences have grown closer in a more multipolar world and the meetings as well as the agreements not only advance their individual interests but also ensure that the bilateral cooperation between them makes a positive contribution in the world arena.

Source: TH

Computation Analysis of Indian Genes

Why in News

Recently, the results from the computation analysis of the 1029 sequenced genomes from India were published in the scientific journal, Nucleic Acid Research.

Key Points

- The analysis has found that out of **55,898,122 single nucleotide variants** in India 18,016,257 **(32.23%) variants are unique and found only in the samples sequenced from India.**
  This emphasizes the need for an India centric population genomic initiative.
- The **analysis was carried out by CSIR** constituent labs, Institute of Genomics and Integrative Biology (IGIB), Delhi and Centre for Cellular and Molecular Biology (CCMB), Hyderabad.

IndiGenomes Resource Database

- It encompasses the **genomic data from over 1000 whole genome sequences sequenced** from across India as part of the **IndiGen programme** and represents diverse geographies and ethnicities.
  - The **IndiGen Programme** was launched in **April 2019,** under which **genome sequencing** of 1029 self-declared healthy Indians drawn from across the country has been completed.
  - Its **objective** was to enable genetic epidemiology and develop public health technologies applications using population genome data.

- The resource provides **access to over 55 million genetic variants representing the contemporary Indian population** with an objective to classify variants involved in **mendelian disorders** and **improve precision medicine outcomes.**
    Mendelian disorder is a type of genetic disorder, resulting due to alterations in a gene or due to abnormalities in the genome.
- It enables the **identification of markers for carrier screening, variations causing genetic diseases, prevention of adverse events** and provides better diagnosis and optimal therapy **through mining data.**
- This resource can provide useful insights for clinicians and researchers in comprehending genetics not only at the population level but at the individual level.

Background

- Despite having this rich genetic diversity, India has been under-represented in global genome studies. Further, the population architecture of India has resulted in high prevalence of recessive alleles.
- In the absence of large-scale whole genome studies from India, the population-specific genetic variants are not adequately captured and catalogued in global medical literature.
- In order to fill the gap of whole genome sequences from different populations in India, CSIR initiated the **IndiGen Programme.**

Genome

- A genome is all the **genetic matter** in an organism. It is defined as an organism's complete set of **Deoxyribose Nucleic Acid (DNA),** including all of its genes.
    Every organism's genetic code is contained in its **DNA,** the building blocks of life.
- Each genome contains all of the information needed to build and maintain that organism.
- In humans, a copy of the entire genome contains more than 3 billion DNA base pairs.

Genome sequencing

- Genome sequencing is figuring out the **order of DNA nucleotides, or bases,** in a genome—the order of **Adenine, Cytosine, Guanines, and Thymine** that make up an organism's DNA.

- **Application:**
  - Genome sequencing can play a crucial role for **new advancements in medical science** (like predictive diagnosis and precision medicine, genomic information) and in **disease management.**
  - Through genome sequencing methodology, researchers and clinicians can **easily detect the disease related to genetic disorder.**
- **Importance of Genome Sequencing:**
  - The study of entire genome sequences will help understand **how the genome as a whole works—**how genes work together to direct the growth, development and maintenance of an entire organism.
  - The genes account for less than 25% of the DNA in the genome, and so knowing the entire genome sequence will **help scientists study the parts of the genome outside the genes.**

Source: PIB

Superconductivity at Room Temperature

Why in News

Recently, **researchers have created a material that is superconducting** at room temperature, however, it **only works at a pressure of 267 Gigapascals** (GPa), which is equivalent to **about three-quarters of pressure at the centre of Earth** (360 GPa).

Key Points

- **Material Used:** A **mixture of carbon, hydrogen and sulfur** was put in a microscopic niche carved between the tips of two diamonds **(diamond anvil)** and laser light was used on them to **trigger chemical reactions.**
- **Process:**
  - As the experimental **temperature was lowered, resistance** to a current passed through the material **dropped** to a vanishingly small value below the **critical temperature** (Tc).
  - The **transition of the sample to become superconductive** occurred the best at **transition temperature of around 15°C at 267 GPa.**

- **Verification:** To verify that this phase was indeed a superconductor, the group ascertained that the **magnetic susceptibility** of the superconductor was that of a **diamagnet.**
    - A **superconducting material kept in a magnetic field expels the magnetic flux out** its body when cooled below the critical temperature and **exhibits perfect diamagnetism.**
    - It is also called the **Meissner effect** which simply means that **magnetic lines do not pass through superconductors** in a magnetic field.
- **Superconductors:**
    - A superconductor is a material that can **conduct electricity or transport electrons from one atom to another with no resistance.**
    - No heat, sound or any other form of energy would be released from the material when it has **reached critical temperature** (Tc), or the temperature at which the material becomes superconductive.
        - The critical temperature for superconductors is the **temperature at which the electrical resistivity of metal drops to zero.**
    - **Prominent examples** include **aluminium, niobium, magnesium diboride,** etc.
- **Applications:**
    - From magnetic resonance imaging (MRI) machines, low-loss power lines, ultra powerful superconducting magnets to mobile-phone towers.
    - Researchers are also experimenting with them in high-performance generators for wind turbines.
- **Limitations:**
    - Their usefulness is still **limited by the need for bulky cryogenics** (production of and behavior of materials at very low temperatures) as the common superconductors **work at atmospheric pressures,** but only if they are kept very cold.
        - Even the most sophisticated ones like **copper oxide-based ceramic materials** work only below −140°C.
- **Significance of the Research:**
    - If researchers can stabilise the material at ambient pressure, **applications of superconductivity at room temperatures could be achieved** and will be within reach.
    - Superconductors that work at room temperature could have a **big technological impact, for example in electronics that run faster without overheating.**

Diamagnetism

- It is a **very weak form of magnetism** that is **induced by a change in the orbital motion of electrons** due to an applied magnetic field.

- This magnetism is **non-permanent and persists only in the presence of an external field.**
- The **magnitude of the induced magnetic moment is very small,** and its **direction is opposite to that of the applied field.**

Meissner Effect

- When a **material makes the transition from the normal to the superconducting state,** it **actively excludes magnetic fields** from its interior and this is called the Meissner effect.
- This constraint to zero magnetic fields inside a superconductor is **distinct from the perfect diamagnetism which would arise from its zero electrical resistance.**

Source: TH

Maritime Vision 2030

Why in News

Recently, the Union Minister of State for Shipping has inaugurated the **Direct Port Entry** (DPE) facility of **V O Chidambaranar Port Trust** (VOCPT).

Key Points

- The state-of-the-art DPE facility is created inside the **Truck Parking Terminal** which was developed under the **'Sagarmala'** for issuing customs clearance of export cargo.
- The IT-enabled infrastructure at the ports will make Indian ports, world-class ports aligning with the **'Maritime Vision 2030'** of the **Ministry of Shipping.**
- **Significance:**
    - It will **reduce logistics cost** and **increase the velocity of the cargo.**
    - It would **enable direct movement of containers from factories,** without intermediate handling at any container freight stations (CFSs), on a **24x7 basis.**
    - It will help in **increasing Ease of Doing Business** for the exporters, as the facility will **bring efficiency and reduce dwell time, lower tariff cost** and **improve the competitiveness of shippers** in international trade.

Maritime India Vision 2030

- It is a **ten-year blueprint for the maritime sector** which **will be released** by the Prime Minister of India at the **Maritime India Summit in November 2020.**
- It will **supersede the Sagarmala initiative** and aims to boost waterways, give a **fillip to the shipbuilding industry** and **encourage cruise tourism in India.**
- **Policy Initiatives and Development Projects:**
    - **Maritime Development Fund:** A Rs. **25,000-crore fund,** which will provide low cost, **long-tenure financing to the sector** with the Centre contributing Rs. 2,500 crore over seven years.
    - **Port Regulatory Authority: A pan-India** port authority will be set up **under the new Indian Ports Act** (to replace the old **Indian Ports Act 1908**) for enabling oversight across major and non-major ports, enhance institutional coverage for ports and provide for structured growth of the ports sector to boost investor confidence.
    - **Eastern Waterways Connectivity Transport Grid project:** It will aim to develop regional connectivity with Bangladesh, Nepal, Bhutan and Myanmar.
    - **Riverine Development Fund:** Calls for extending low cost, long-term financing for inland vessels with the support of a Riverine Development Fund (RDF) and for extending the coverage of the tonnage tax scheme (applicable to ocean-going ships and dredgers) to inland vessels also to enhance the availability of such vessels.
    - **Rationalisation of Port Charges:** It will make them more competitive, besides doing away with all hidden charges levied by ship liners to bring in more transparency.
    - **Promotion of Water Transport:** For decongestion of urban areas, and developing waterways as an alternative means of urban transport.

Source: PIB

Tectonically Active Zone of Himalayas

Why in News

Recently, a group of scientists from the **Wadia Institute of Himalayan Geology** (WIHG), Dehradun have found that the **Indus-Tsangpo Suture Zone (ITSZ) of Himalaya**is **tectonically active.**

- The suture zone of Himalaya was conventionally thought to be locked.
- WIHG is an **autonomous institute** under the **Department of Science and Technology** (DST), Government of India.

- **Tectonics** is the **scientific study of the deformation of the rocks** that make up the Earth's crust and the forces that produce such deformation.
    It deals with the **folding and faulting** associated with mountain building, the large-scale, **gradual upward and downward movements** of the crust and **sudden horizontal displacements** along faults.

Key Points

- **Geological Features that Support the Finding:**
    - Sedimentary beds are tilted and thrust broken.
    - Rivers are associated with uplifted terraces.
    - Bedrock shows brittle deformation at much shallower depths.
- These deformed geological features were **dated using the technique of Optically Stimulated Luminescence** (OSL) and data of **seismicity** and **denudation rate** was also reviewed.
    - **Optically-Stimulated Luminescence:** It is a late **quaternary** (geological time period that encompasses the most recent 2.6 million years) dating technique used to date the last time quartz sediment was exposed to light. As sediment is transported by wind, water or ice, it is exposed to sunlight and zeroed of any previous luminescence signal.
    - **Seismicity:** It is the worldwide or local distribution of **earthquakes** in space, time, and magnitude. More specifically, it refers to the measure of the frequency of earthquakes in a region.
    - **Denudation:** It is a long term process in which the wearing and tearing of the surface of the Earth take place. It includes all those processes that lower relief and acts both chemically **(chemical weathering)** and physically **(mechanical weathering).**
- **The region of the ITSZ has been neo-tectonically active since the last 78000-58000 years.**
    - The ITSZ is a suture zone in the **Ladakh region** and marks the limit of the **Indian plate where it collides with the Eurasian plate** and is subducted below the latter.
    - The ITSZ can be traced for **more than 200 km** and a wide variety of rock association along the ITSZ indicates that the collision at the plate boundary was of very **complex nature.**
- The ITSZ was conventionally believed to be a locked zone till now.
- This will have **major implications** in terms of earthquake study, prediction, understanding the seismic structure of the mountain chains well as its evolution.

Suture Zones

- A suture zone is a **linear belt of intense deformation,** where distinct terranes, or tectonic units with different plate tectonic, metamorphic, and paleogeographic histories join together.
- These zones also **provide the only record of deep oceanic crust and of ancient seafloor processes** for roughly the first 90% of Earth's history.
- Their study provides a means to understand the end-product of **plate tectonic processes** in time and space. In plate tectonics, sutures are seen as the remains of subduction zones together with the terranes possibly representing fragments of different tectonic plates.
- The suture zone is often **represented on the surface by a mountain range comprising intensely deformed rocks.**
- The **Iapetus Suture from Great Britain,** which is now concealed beneath younger rocks, and **Indo-Tsangpo Suture** well exposed in the Himalayas are some of the best examples of suture zones.

Source: PIB

Electronic Exchange of Customs Data

Why in News

Recently, the **Department of Posts, Government of India (India Post) and United States Postal Service** signed an **agreement** for **electronic exchange of customs data** related to postal shipments between the two countries.

Key Points

- **Objective:** The primary objective of this agreement is to facilitate **'ease of exports'** for small and large exporters through postal channels from different parts of the country.

- **Features:** The agreement will make it **possible to transmit and receive electronic data of international postal items prior to their physical arrival at the destination** and would **enable customs clearance of postal items in advance** in line with the evolving global postal framework.

  Exchange of Electronic Advance Data (EAD) will be a key driver towards **promoting mutual trade** with emphasis on the exports.

  - **USA is the top export destination for India** (~17%) which is also reflected in exchange of goods through postal channels.
  - In 2019, around 20% of international **Express Mail Service (EMS)** and 30% of Letters & Small Packets transmitted by India Post were destined to the USA whereas 60% of the Parcels received by India Post were originated from the USA.
- **Benefit:** This will fulfill a major demand of the export industry to expedite customs clearances of export items and will contribute towards making India an Export Hub for the world.

  The agreement will also improve the performance of postal services in terms of reliability, visibility and security.

India Post

- India Post is the **trade name for the Department of Posts (DoP), a** government-operated postal system in **India under the Ministry of Communications.**
- With 1, 55,531 Post Offices, the DoP has the most widely distributed postal network in the world.
- **Functions:**
  - Delivering mails, accepting deposits under **Small Savings Schemes**, providing life insurance cover under Postal Life Insurance (PLI) and Rural Postal Life Insurance (RPLI) and providing retail services like bill collection, sale of forms, etc.
  - It also acts as an agent for the Government of India in discharging other services for citizens such as **Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)** wage disbursement and old age pension payments.

Source: PIB

Single Male Parent

Why in News

Male Government employees who are single parents will now be **eligible for child**

care leave.

Key Points

- **Aim: Ease-of-living** for government servants.
- **Eligibility:** Male government employees who were **single parents.**
  Single male parents, includes unmarried employees, widowers and divorcees, who may be expected to take up the responsibility of caring for a child single-handedly.
- **Features:** Child care leave can be **granted at 100% of leave salary for the first 365 days** and **80% of leave salary for the next 365 days.**
  In case of a **disabled child,** the condition of availing child care leave up to the age of 22 years of the child has been removed and now **child care leave can be availed by a government servant for a disabled child of any age.**
- **Child Care Leave:** It is treated as **earned leave** and is generally granted to women employees.
  - Women employees having **minor children (children upto 18 years of age)** may be granted child care leave for a **maximum period of two years (i.e. 730 days)** during their entire service for taking care of upto two minor children
  - The child care leave is granted either for rearing children or to look after any of the needs of children like examination, sickness etc.

Source: IE