



CURRENT AFFAIRS

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Current Affairs November 2020

1. All About Asteroid 16 Psyche:

- Asteroid 16 Psyche orbits between Mars and Jupiter. The asteroid was discovered in the year 1853 by Italian astronomer Annibale de Gasparis.
- He named the asteroid after the ancient Greek goddess of the soul, Psyche.
- A recent study has found that the asteroid could be entirely made up of metals and could worth \$10000 quadrillion.
- The study was published in The Planetary Science Journal.
- The researchers for the study used the Hubble Space Telescope to get a closer look at the asteroid.
- They found that the 16 Psyche contains iron, nickel, gold, platinum, iridium, cobalt and rhenium.
- But, the exact composition of the asteroid will be known in 2022 when NASA will send a probe to study the asteroid.
- Researchers believe that the asteroid is a remnant of a planet's core, which could have lost its crust and mantle due to collision in the early days of planet formation in our solar system.

Facts about 16 Psyche:

- Located in the asteroid belt, 16 Psyche is one of the massive objects in the belt.
- It is at a distance of 370 million kilometres from Earth.
- The asteroid is 140 miles in diameter and is shaped like a potato.
- Asteroids, in general, are made up of rocks or ice. But, scientists believe that Psyche is a solid metallic object, a core of a planet that failed to form.

The Study Findings:

- Researchers from the Southwest Research Institute used Hubble Space Telescope to observe the asteroid at two specific locations in its rotation so that they can observe both sides of the asteroid.
- They have also made the first ultraviolet observation of Psyche, revealing its composition.
- Scientists observed that the way in which Psyche reflected ultraviolet is akin to iron reflecting sunlight.
- They observed iron oxide ultraviolet absorption bands from the asteroid, which means oxidation is happening on the asteroid possibly due to solar wind hitting the surface of Psyche.
- Solar wind means charged particles that are emitted by the sun's hot outer atmosphere known as the Corona.
- Metal asteroids are uncommon in our solar systems. Meteorites commonly contain metals. But the study of Psyche will give a rare glimpse of what exactly will be the composition of the core of a planet.

The Estimated Value, Is It Real?

- Scientists from NASA believe that the asteroid is almost entirely made up of iron and nickel with fewer quantities of rare materials like gold, platinum, cobalt, iridium and rhenium.
- Hypothetically, if the asteroid is transported to Earth, scientists estimate iron alone would be worth \$10000 quadrillion.
- But, there is no technology developed yet to bring Psyche to earth.

NASA's Psyche Mission:

- In the next two years, NASA is planning to send a probe to Psyche that will be launched from Space X's Falcon Heavy rocket.
- If the probe is launched in 2022, it will reach Psyche in 2026.
- The probe will orbit the asteroid for 21 months.
- The primary objective of the mission is to take pictures of Psyche. Later, the probe will map Psyche from a distance.

- Another objective is to determine whether Psyche is really a remnant of a planet or is merely an asteroid made up of unmelted material.
- From the data so collected, scientists will also determine the age of 16 Psyche.

2. A Rogue Planet Discovered in the Milky Way:

- Scientists have recently discovered a rogue planet in our Milky Way Galaxy, which is a rare find.
- Rouge planets are gravitationally unbound to any stars. Detecting them is very difficult.
- But, Polish astronomers from OGLE Survey have recently discovered a rogue planet in our Milky Way Galaxy.
- This particular rogue planet is the first one detected to be of Earth size.
- Till now, 4000 extrasolar planets have been discovered.
- A common thing that underlines planets in our solar system and extrasolar planets are that they orbit a star. But, planet formation and evolution theories predict free-floating or rogue planets.
- These planets are gravitationally unattached to any star.

How Exoplanets are Discovered?

- Exoplanets orbiting a star are generally discovered using the light shift in the planet's host star.
- When an exoplanet passes in front of its host star's disk, the star's light drops periodically in small amounts causing the so called transits.

Detecting Rogue Planets:

- Free-floating planets are hard to find using the transit method as they exhibit no radiation as do not have a host star.
- Instead, astronomers detect rogue planets using an astronomical phenomenon called gravitational microlensing.

Microlensing emanates from Einstein's theory of general relativity:

- According to the theory, a mass object can bend the light of a background object. Here, the mass object is the lens and the background object can be a star.
- When a mass object passes between an observer on earth and the distant star, the object acts as a magnifying lens where the gravity of the object deflects the light from the background star for a brief period resulting in brightening of the source star's light.
- According to astronomers, chances of observing microlensing is extremely rare as there must be perfect alignment between the observer, the lens and the source star.
- Thus, when one is hunting for microlensing events, if only one source star is observed, one has to wait for another million years for microlensing to happen.
- Thus, surveys such as OGLE survey observes millions of source stars at the centre of the Milky Way Galaxy where microlensing events will be highest.
- As microlensing does not depend on lens' brightness both faint and dark objects such as planets can be detected.
- The duration of microlensing depends on the mass of the lensing object - less massive objects will have shorter lensing duration.
- Microlensing events associated with stars can be observed for a few days. But, lensing events associated with free-floating planets can be observed only for a few hours.
- Astronomers determine the mass of the object by measuring the duration of the lensing event and the shape of the light curve.

OGLE Survey:

- Polish astronomers of the OGLE survey are using a 1.3-meter Warsaw Telescope located at Las Campanas Observatory, Chile to observe microlensing events.
- The rogue planet discovered has one of the shortest microlensing event recorded to date.
- The event is named as OGLE-2016-BLG-1928 and the duration was 42 minutes.
- This is not the first time the OGLE survey had detected a rogue planet.

- A few years ago OGLE astronomers provided the first evidence for a large population of rogue stars in the Milky Way galaxy.
- But, the new planet discovered is the smallest rogue planet discovered to date.

3. Commission for Air Quality Management:

- The President of India signed the Ordinance for the Commission for Air Quality Management in Delhi and Adjoining Areas.
- It will be a statutory committee to track and combat air pollution in and around the National Capital Region.
- The Commission is aimed at better coordination, research, identification, and resolving problems surrounding air pollution in North India.
- The new Commission will guide the bodies such as state and central pollution control boards of Delhi, Uttar Pradesh, Punjab, Haryana and Rajasthan.
- The Commission will have powers to direct the state governments on issues related to air pollution.
- Only NGT is authorized to hear cases related to the Commission.

Composition of the Commission:

- It will be an 18-member commission headed by a full-time chairperson.
- The Chairperson will be a former or serving secretary to the Government of India or a Chief Secretary to a state.

The other members include:

- A representative from the Environment Ministry
- Five ex-officio members from the States mentioned in the Ordinance
- Two full-time members who are either serving or former joint secretaries
- A technical member each from the Central Pollution Control Board and Indian Space Research Organisation
- One member from Niti Aayog
- Three independent members

Role of the Commission:

- The new Commission has powers that are similar to the Environment Pollution (Prevention and Control) Authority (EPCA).
- The Commission will have state representatives.
- According to the new Ordinance States as well as Central Bodies will not have any jurisdiction in matters related to air pollution in the states mentioned in the Ordinance.
- The Commission will look at the coordination between the states, planning, execution of policy interventions, inspections, operations of industry and research into the causes of pollution.
- It will specifically monitor the actions taken by the states against stubble burning, industrial emissions, vehicular emissions, road dust, biomass burning and construction activities.
- The power to issue fines will lie with the new Commission. It has the authority to give directions for imprisonment for a maximum of five years and a fine of upto Rs. 1 crore or both. But first, the offender must be tried before a first class judicial magistrate.
- The Commission also has the power to take up matters suo motu and file a case before a first class magistrate.
- The new Commission will erase the relevance of state pollution control bodies as they do not have any power to make decisions.
- If a direction is issued by the Commission and the State clashes, the decision of the Commission will be considered.
- The Commission has a responsibility to mandatorily submit an annual report to the central government on the action-taken and research undertaken to tackle air pollution.
- The report will be presented before the Parliament.

- The Commission also has the power to make regulations, but prior approval of the Central Government is required. Further, the regulations must be notified and must be kept before each house of the Parliament.
- The ordinance has empowered the new Commission to form Special Investigative Groups for stricter implementation of its directions. This was the major lacuna in Supreme Court formed EPCA.

Environment Pollution (Prevention and Control) Authority (EPCA):

- Environment Pollution (Prevention and Control) Authority (EPCA) was set up by the orders of the Supreme Court.
- EPCA is not a statutory body but has the authority to deal with the cases of air pollution as part of the judgment in M C Mehta vs Union of India (1988).
- EPCA was not supported by a legal framework but has the authority to issue fines, directions and guidelines to the government in other states other than Delhi NCR.
- EPCA played a crucial role in drafting the long-term Comprehensive Action Plans (CAP) for combating air pollution.
- It had only two permanent members and no state representatives.
- The achievements of EPCA starting 1998 was the phase-wise replacement of Delhi's public transport fleet from diesel to CNG, the rollout of the BS-VI grade fuel and emission standards, recommended building two bypasses to move traffic not destined to Delhi.
- The BS-VI fuel has 80% less Sulphur content than BS-IV.
- The two bypass roads are now known as Eastern and Western Peripheral Expressways.
- Some other measures taken by EPCA include setting up standards for Sulphur dioxide and oxides of nitrogen, ban on pet coke and furnace oil in NCR regions and closing the Badarpur power plant in Delhi.
- With the promulgation of the Ordinance, the 22-year old EPCA will be dissolved.

4. Malabar Naval Exercise Begins:

- The phase 1 of the Malabar Navy Exercise is going to start on 3rd November.
- Since 2007, for the first time, the Australian Navy is going to take part in the exercise.

Malabar Exercise:

- Malabar Naval Exercise is a multilateral exercise.
- The exercise includes simulated war games and combat tactics.
- It was started as a bilateral exercise between India and the USA navies in 1992.
- Later, it was joined by Japan in 2015 and transformed into a multilateral exercise.
- This year, the exercise will have a new member, the Australian Navy.
- Also, this year, the Malabar exercise will be conducted in two phases.
- The first phase is on 3rd November off the coast of Visakhapatnam.
- The second phase is in mid-November in the Arabian-Sea.
- In 2019, the exercise was held in September off the coast of Japan.
- Considering the COVID-19 protocols, this year's exercise has been planned on a "non-contact-at sea".

Participation of Australia:

- This year's exercise is different as the exercise will see the participation of all the **Quad countries**.
- The exercise will help India to increase its cooperation with other countries in the maritime security domain and also to increase defence cooperation with Australia.
- There were two Malabar exercises in 2007.
- The first phase was held at Okinawa island off Japan in the Western Pacific and for the first time, it was held away from the Indian shores.
- The second phase was held in September off the coast of Visakhapatnam and was participated by India, Japan, the US, Australia and Singapore navies.
- Australia stopped participating and Japan became a regular participant in 2015.

- The participation of four big navies from the Indo-pacific region will send a strong message to China.

Other Naval Exercises by India:

- The Indian Navy conducted several **Passage Exercises (PASSEX)**.
- The Passage Exercises (PASSEX) were conducted with navies of **Japan, Australia and the US**.
- These exercises were conducted to increase operability between navies.
- With the Royal Australian Navy, the Indian Navy conducted PASSEX.
- In July, Indian conducted the passage exercise with the US carrier strike group, USS Nimitz.
- The USS Nimitz, the US carrier is one of the largest warships in the world.
- After completing the freedom of navigation exercise in the South China Sea, the carrier strike group passed through the Indian Ocean region.
- In June, a similar exercise was conducted with the Japan Maritime Self Defence Force.

5. Farmers Benefitted From Accurate Forecasting:

- According to the study, the total annual economic benefits to the farmers and livestock owners has been increased with the help of accurate weather forecasting by the Indian Meteorological Department (IMD) and agencies working under the Ministry of Earth Sciences.
- The estimated total annual economic benefits was Rs. 13,331 crore.
- The incremental benefits for the next five years is estimated to be Rs. 48,056 crores.
- The total annual income gained by the fishermen due to better forecasting is calculated to be Rs. 663 crore.
- The present value of benefits accruing through the agricultural farmers and livestock owners for a period of five years is Rs. 2391 crore.
- The **National Council of Applied Economic Research (NCEAR) conducted the study**. The survey was done on behalf of the Ministry of Earth Sciences (MoES).
- The **NCEAR is non-profit think tank of economics and is an independent institution located in the national capital New Delhi**.
- The key feature of the survey is to evaluate economic benefits of the government's investments in the **National Monsoon mission** which was launched in 2012.
- The National Monsoon Mission is a Rs.1000 crore mission.
- The survey shows that the country would gain economic benefits of worth Rs 50 for every rupee spent on the National Monsoon Mission and other high computing programmes of the MoES.
- The most prominent weather services for farmers for their day-to-day operations is the IMD, which is an agro-meteorological services.
- For fishermen, the weather forecast and warnings are provided by the **Indian National Centre for Ocean Information Services (INCOIS)**.
- Today, over 7 lakh fishermen use these services.
- The study was conducted across 173 rain-fed districts in 16 states.
- Based on the weather advisories, 98% farmers made modifications to their farm practices.
- This included changing breed of crop, arranging storage of harvest, early or delayed harvesting, early or delayed sowing, changed schedule of ploughing and land preparation, change of pesticide application schedule and change of irrigation schedule.
- Around 94% of framers said that the weather forecast helped them in avoiding losses or increase income.
- Using Ocean State Forecast (OSF) advisories, 82% fishermen avoided venturing into the sea and 95% of them avoided empty trips.
- The OSF advisories helped to save operational costs of Rs 18.25 crore by avoiding venturing into the sea.
- Additional catch generated with the help of Potential Fishing Zone (PFZ) advisories had generated Rs 1.92 crore additional income from 1,079 successful fishing expeditions.

National Monsoon Mission:

- The mission was launched to improve the monsoon prediction capability of the country.
- The mission aims at improving models in the short, medium, extended and seasonal range scales.
- The main objectives are
- To improve improve Seasonal and Intra-seasonal Monsoon Forecast
- To improve Medium Range Forecast.
- The Three participating institutions for the Mission are
- Indian Institute of Tropical Meteorology, Pune
- National Centre for Medium Range Weather Forecast, Noida
- India Meteorological Department, New Delhi

6. Pilot Scheme for Distribution of Fortified Rice Began:

- The Department of Food and Distribution (DFPD) launched the '**Centrally Sponsored Pilot Scheme on Fortification of Rice**' and its distribution through the Public Distribution System (PDS) towards **nutritional security**.
- The scheme is **aimed at fighting against chronic anaemia and undernutrition**.
- This **Pilot Scheme** has been approved for **three years** with a **budget of Rs 174.6 from 2019**.
- The DFDP **identified 15 state governments** and their respective districts for the distribution of rice.
- The distribution of fortified rice has already started in Andhra Pradesh, Gujarat, Maharashtra, Tamil Nadu and Chhattisgarh.
- A review meeting was conducted by the Union Minister for Food and Consumer Affairs on 31st October 2020 and emphasised scaling up of the distribution of fortified rice in the country.
- The DFDP approached the Food Corporation of India (FCI) to come up with a plan for the procurement and distribution of fortified rice.
- The rice will be distributed under the **Integrated Child Development Services (ICDS) and Mid-Day Meal Scheme (MDM) from 2021-2022**.
- With the **Mid-Day Meal scheme, children in government schools and anganwadis will be soon eating rice infused with iron, folic acid and vitamin B-12**.
- The main focus of the Pilot Scheme will be on procuring and supplying fortified rice to the **112 specially identified Aspirational Districts**.
- The supply of **Fortified Rice Kernels (FRK)** is to the tune of 15,000 MT per annum.
- To cover 112 aspirational districts for PDS, MDM and ICDS there is a need for 130 Lakh MT of Fortified rice.
- To distribute the quantum of rice, there must be an uninterrupted supply of FRK from the industry about 3.5 Lakh MT.
- In the country, there are 28,000 rice mills that need to be equipped with blending machines for mixing the normal rice with fortified rice.
- The supply chain and logistic implications were held with NITI Aayog, FSSAI, Tata Trust and World Food Programme.

Aspirational Districts Programme:

- Launched in the year 2018, the Transformation of Aspirational Districts Programme (ADP) aimed at improving the socio-economic status of 117 poor districts from across 28 states of the country.
- The programme is entirely driven by the state governments.
- At least one district is selected from the 28 states.
- The progress of the programme is monitored in real-time through a dashboard.
- Niti Aayog is the primary agency for monitoring the progress of the programme.
- The programme has three core principles and five broad themes with appropriate weightage for monitoring progress.
- **The three core principles are:**

a) Convergence of central and state schemes

b) Collaboration among citizens and functionaries of central and state governments including district teams

c) Competition among districts

▪ **The Five themes are:**

1. Health and nutrition with 30% weightage
2. Education with 30% weightage
3. Agriculture and water resources with 20% weightage
4. Financial inclusion and skill development with 10% weightage
5. Basic infrastructure with 10% weightage

7. Cosmic Radio Burst Mystery Solved:

- Scientists have solved the mystery about the radio bursts that zip and zigzag the Universe.
- Scientists have known about the fast radio burst for about 13 years that are coming from outside of our galaxy.
- The astronomers found it difficult to trace what causes them as it happens so fast in a couple of milliseconds.
- In April 2020, Scientists spotted a weaker burst coming from inside of the Milky Way galaxy with the help of two different telescopes.
- The two telescopes were a **California doctoral student's set of handmade antennas and included cake pans and the other telescope was a \$20 million Canadian Observatory.**
- According to four different studies conducted by the astronomers, they traced the fast radio burst to a **star called magnetar which is 32,000 light-years from Earth.**
- **This is the first emanating radio burst that is traced from the Milky Way Galaxy.**
- **Magnetars are dense neutron stars with 1.5 times the mass of the Sun.**
- They are young stars and are a part of the star birth process.
- Astronomers believe that only a dozen such stars could be found in the entire Milky Way Galaxy as the galaxy is not flush with star births, unlike some other galaxies.
- **Magnetars have enormous magnetic fields** that sometimes buzz and crackle with energy.
- Sometimes **these stars burst flares of X-rays and radio waves from them.**
- The strong magnetic fields of Magnetars could tear apart an atom nearby and bizarre aspects of fundamental physics occur near it.
- The detected radio burst occurred in less than a second and contained the same amount of energy that the sun releases in a month.
- These radio bursts are not dangerous when compared with more powerful ones from outside the galaxies.
- The radio bursts that come from outside the galaxy are million times more powerful than the earth's magnetic field.
- Scientists believe that these occurrences are so frequent which can happen 1,000 times a day outside the galaxy.
- For detecting the bursts, the scientists used **Bochenek's antennas** which cost about \$15,000.
- Its size is a large bucket with a 6-inch metal pipe with two literal cake pans..
- These telescopes are designed to look at the giant chunk of the sky.
- The Canadian observatory in British Columbia pin-pointed the source to the magnetar in the constellation **Vulpecula.**
- Astronomers made 50 different theories to study the cause of fast radio bursts.
- Two different types of radio bursts have been identified so far - radio bursts that occur only once and radio bursts that repeat itself.
- The astronomers' team who studied the radio burst from within our galaxy has also discovered an outburst that happens every 16 days to a nearby galaxy. They will soon pinpoint the source of the radio burst.

Are Magnetars the only Source?

- Though through the recent discovery astronomers were able to determine Magnetar as a source for fast radio bursts, these may not be the only source.
- Neutron stars are other possible sources.

8. Body Mass Index of Young Indians Is Lowest:

- According to a Lancet study, India ranks third and fifth from last among 200 countries where 19-year-old girls and boys have low body index.
- The study was conducted according to the new estimates for the BMI and height trends in 2019 across 200 countries.
- The normal BMI range is 18.5 to 24.9, overweight as 25 or higher and obesity as 30 or higher.
- These guidelines were given by the World Health Organisation (WHO).
- The Body Mass Index is measured as the weight in kilograms by the square of the height in metres.
- In India, the mean BMI of 19-year-old boys is 20.1 when compared with the Cook Islands which is high of 29.6 and a low of Ethiopia 19.2.
- The mean BMI for Indian girls is 20.1 when compared to Tonga which is a high of 29.0 and low of Timor-Leste 19.6.
- For 19-year-old Indian boys the mean height is 166.5 cm and for girls 155.2 cm.
- This is below the high of Netherlands boys which is 183.8 cm and girls 170 cm.
- There is approximately 8 years of growth gap for girls and 6 years for boys with the 20 cm or higher differences between countries with the tallest and shortest mean height.
- The 19-year-old Indian girls have the same mean height as 12-year-old Dutch girls.
- Researchers used 115 data sources from India with 2.1 million participants in the analysis.
- Though the height and BMI increased from 1985 to 2019 there is still height potential while curbing obesity.
- For this, programmes are needed for the poor from birth to school years.
- In India, there is a dual burden of overnutrition and undernutrition.
- When compared with children of developed countries, overweight and obesity among both Indian boys and girls are low.
- This is due to variations in the epigenetic, dietary intakes, parental education, familial, psychosocial, income and occupations.
- So, there is a need for regular diet and nutrition surveys in India to reduce the increase of overweight and obesity among children and adolescents.
- In Adult age, overweight and obesity may lead to metabolic disorders like insulin resistance, hypertension, diabetes, CVDs, strokes and cancers.

9. New State-Wise Coverage Ratio under NFSA:

- Under the **National Food Security Act, 2013 (NFSA)**, the government has started the process of confirming the new States and UT specific coverage ratios for both urban and rural regions.
- Under the NITI Aayog, the Ministry of Statistics and Program Implementation (MoSPI) has undertaken the process.
- A review meeting was conducted by the NITI Aayog where the Ministry has furnished the inputs of coverage of the population criteria under the NFSA.
- In the country, the NFSA covers 75% of the rural population and 50% of the urban population.
- The Planning Commission has done the state-wise coverage under NFSA by using the National Sample Survey Household Consumption Expenditure Survey for 2011-12.
- From 2012, the State-wise coverage ratio has not been done.
- Across the country, Manipur has the maximum coverage ratio of 85.75% and the lowest coverage ratio of 1.70% is for Andaman and Nicobar.
- In other states like Bihar, the coverage ratio is of 74.53%, Uttar Pradesh 64.43% and Madhya Pradesh 62.61%.

- Each **Antyodaya Anna Yojana** household is entitled to 35 kg of food grains per month.
- The households are also entitled to 5kgs of food grains per person per month.
- The beneficiaries under NFSA will be given additional 5 kgs of free food grains per person per month through **Pradhan Mantri Garib Kalyan Anna Yojana (PM-GKAY)**.
- Initially, PM-GKAY was launched for three months (April, May, June) but now it was extended to another five months.

NFSA 2013:

- The act has made food security a right from the earlier welfare approach to food security.
- As per the Act, 75% of the rural population and 50% of the urban population are legally entitled to subsidised food grains under the Targeted Public Distribution System (TPDS).
- The act effectively covers two-thirds of the Indian population.
- As per the act, beneficiaries will get rice at Rs. 3 per kg, wheat at Rs. 2 per kg and coarse grains at Rs. 1 per kg.
- Free cereals are provided to pregnant and lactating women and children of certain categories.
- Under the Act, it is the duty of the States and UTs to determine the beneficiary households.

10. Launch of Earth Observation Satellite:

- ISRO had successfully launched the Earth Observation Satellite EOS-1.
- A total of 10 satellites including nine foreign satellites were launched by PSLV-C49.
- EOS-01 along with 9 customer satellites were placed in the 575 Km orbit.
- The satellite commenced operating its function along with the deployment of solar panels.
- Due to COVID-19, ISRO implemented precautions by maintaining social distance and scientists wearing masks.
- ISRO arranged for the live telecast of the launch through various platforms.
- The rocket launch took place at Sriharikota, Andhra Pradesh.
- The rocket launch took place at the first launch pad of SDSC at 3.12 pm at the end of the 26-hour countdown.
- It is the 51st flight with the four-stage 44.5 meters tall PSLV-C49.
- The launch was originally scheduled for 3.02 pm but delayed due to debris on the path of the rocket and weather conditions.
- The PSLV C-49 rocket first injected the primary satellite EOS-01 into orbit.
- All the 10 satellites were separated and placed into desired orbits.

EOS-01 Applications:

- The applications of EOS-01 are in agriculture, forestry, and disaster management support.
- Of the nine foreign satellites **four are from the USA, four from Luxembourg and one from Lithuania.**
- The international customer satellites were launched under the arrangement with the **NewSpace India Limited (NSIL).**

Uses of Earth Observation Satellites:

- Agricultural Crops Inventory
- Water Resources Information System
- Ground Water Prospects
- Forest Working Plans
- Biodiversity and Coral Mapping
- Potential Fishing Zones
- Ocean State Forecasts
- Rural Development
- Urban Development
- Monitoring of Glacial Lakes and Water Bodies
- Location based Services using NavIC constellation
- Cyclone and Floods Mapping & Monitoring

- Landslide Mapping & Monitoring
- Agricultural Drought
- Forest Fire monitoring
- Earthquakes
- Extreme Weather Monitoring
- Experimental Forecasts

New Space India Limited:

- The New Space India Limited was established in the year 2019 under the administrative head of the Department of Space.
- The NSIL is a Public Sector Enterprise that was created with an objective to increase industry participation in the Indian space program.
- The business areas of NSIL are:
 1. To promote industry participation in the production of PSLV and small satellite launch vehicles catering to the growing demand for such vehicles in the international market.
 2. Producing and marketing space-based services such as launch services, leasing of transponders, mission monitoring services, etc.
 3. Building small satellites and Earth observation satellites as per client's requirements.
 4. Acting as the nodal agency for the transfer of technology developed by ISRO and its units.
 5. Marketing spinoff technologies from products and services developed by ISRO.
 6. Providing consultancy services.

11. Challenges in Delivery of COVID-19 Vaccine:

- Experts say that the delivery of CoVID-19 vaccines poses a huge challenge.
- The government announced the distribution of the COVID vaccine under the COVID-19 immunization programme.
- The government will procure and distribute the vaccine to four categories of people, free of cost.
- The first category is for healthcare workers which include doctors, nurses, and ASHA workers.
- The second category is for frontline workers which includes police and armed forces.
- The third category is for citizens above 50 years of age.
- The final category is for below 50 years of age with co-morbidities.
- Experts say that hard choices are to be made when there is an insufficient supply of vaccines.
- Deciding whom to distribute will become difficult such as the ones that are more effective to the vaccine is the younger population than the elder one and whom to choose first.
- The government may allow companies to purchase vaccines for the maintenance of business continuity.

Temperature Requirements:

- The COVID vaccines are to be distributed at ultralow temperatures.
- Most of the COVID vaccines are RNA vaccines which are in the advanced Stage of Phase-3 trials and require -70 degree C to -80 degree C cold chain.
- The COVID vaccine is similar to the EBOLA vaccine which requires the same kind of cold storage.
- The Ebola vaccine storage was difficult to establish in countries like West Africa.
- Experts say that how feasible is it to distribute the vaccines in the US, UK, and in India where tens and hundreds of million doses are required.
- Scientists are modifying the vaccines and increase their ability to match with the storage conditions in the other parts of the world.

Resources:

- For continuous supply of vaccines, the resources required are the storage requirements and building infrastructures for ultracold storage.

- India does not have this kind of storage as it requires freezers along with an uninterrupted power supply.
- So for the delivery of the vaccine, there is a need to consider the logistics and infrastructure which goes beyond the financial resources to purchase vaccines.
- The next biggest challenge is vaccinating people.
- For the best results, people are vaccinated with two doses for four weeks.
- This is much similar to polio and rubella campaigns.

Adults and Children:

- The National Immunisation Programme is limited to vaccinating children and this should be taken into consideration.
- COVID-19 vaccine will be given to all ages including the older people.
- The vaccines are prioritized according to the groups identified by the government.
- The vaccines are available only in the public sector in the initial stage

12. Survey on Biodiversity of Ganga:

- The Wildlife Institute of India (WII) had conducted a survey on the biodiversity of the Ganga marking the 12th anniversary of the declaration of Ganga as a national river.
- The WII is in the second phase of the survey on the entire mainstream of the Ganga river.
- The survey showed that 49% of the river has high biodiversity.
- The biodiversity includes Gangetic Dolphins and Otters with an increase in their number.
- This indicates reduced pollution levels and a healthier state of the river.
- The WII will conduct the second part of the Ganga survey and collects the data on how the river habitat has increased and its effect on the species living in the river.
- The first phase of the survey was conducted in 2017-19.
- The WII took the initiative on behalf of the National Mission for Clean Ganga.
- The National Mission for Clean Ganga is one of the flagship projects under the Ministry of Jalshakti.
- This is the first survey conducted in the country on the entire river.
- The Ganga flows through 11 states along with its tributaries and covers 26.3% of India's total geographical area.
- But the main stem of Ganga flows through 5 states which include Uttar Pradesh, Bihar, Uttarakhand, Jharkhand, and West Bengal.
- The high biodiversity areas of 10% fall around the national parks and sanctuaries like Rajaji National Park in Uttarakhand, Uttar Pradesh's Hastinapur Wildlife Sanctuary, and Vikramshila Gangetic Dolphin Sanctuary in Bihar.
- The high biodiversity areas are divided into six zones.
- The six zones are Devprayag to Rishikesh-61km, Bhitaura to Ghazipur-454km, Makdumpur to Narora-147km, Chhapra to Kahalgaon-296km, Sahibganj to Rajmahal-34km, and Baharampur to Barackpore-246km.
- The biodiversity tracking includes aquatic and semi-aquatic species such as the Gangetic Dolphins, otters, gharials, turtles, and various waterbird species.
- Many species found in the main stem had been disappeared and are now coming back.
- Researchers found the nesting colonies of Indian Skimmer and Seibold's a species of water snake which disappeared has now resurfaced.
- Researchers found many species that are traveling back from tributaries to the main stem of the river and also found new distributions of the pufferfish.
- In the 19th century, there were 10,000 Gangetic Dolphins were present and reduced to 3,526 by 2000.
- The dolphins disappeared entirely in Haridwar and most of the Yamuna.
- The rapid biodiversity of the Ganga is reduced due to the loss of suitable habitat conditions, change in the river's morphology due to the construction of barrages and dams, agriculture, bank alteration, and sand mining.

13. PLI Scheme - New Sectors Included:

- The government is aiming to expand the Production Linked Incentive (PLI) Scheme to ten more sectors.
- As the imports are cut down, the PLI Scheme looks to capture the demand of the domestic market.
- Some of the sectors under the PLI schemes are food processing, textiles, mobile phones, allied equipment, pharmaceutical ingredients, and medical devices.

What is PLI SCHEME?

- To cut down the import and to boost domestic manufacturing, the central government launched the PLI scheme in March 2020.
- The Scheme will give incentives to the companies on incremental sales for the products manufactured in the domestic units.
- The PLI scheme allows foreign companies to set their units in India.
- This scheme could create jobs for the employable workforce of India.

What is the need for the scheme?

- The government cannot invest in capital intensive sectors as they need longer times for the returns.
- So experts say that the idea of the PLI Scheme is important.
- The government will invite global companies with huge capital investments in the country.
- In large sectors like electronics and pharmaceuticals, the government made huge capital investments.
- Now, the government should focus on the labor intensive sectors like garments and leather.

Sectors under PLI Scheme:

- The sectors that were included under the PLI Scheme in March were mobile manufacturing, pharmaceutical ingredients.
- On April 1, the government notified guidelines for mobile and allied equipment.
- For mobile and electronic equipment manufacturing, an incentive of 4-6% is planned under the PLI Scheme.
- The incentives are applied for the companies that manufacture mobile phones and electronic components such as diodes, transistors, resistors, thyristors, capacitors, and microelectromechanical systems.
- For the pharmaceutical ingredients and medical devices, the applicants should pay a certain amount prescribed by the government as an investment to build capacities.
- The selected companies will get a specific proportion of their turnover for making and selling the bulk drugs and devices as an incentive.
- This scheme will focus on building economies of scale in over 50 critical pharmaceutical active ingredients like penicillin G, vitamin B1, dexamethasone, aspirin, meropenem, and atorvastatin.
- The new sectors included under the scheme are textiles, leather, food processing, and battery manufacturing.

14. All About States Borrowing for GST Compensation:

- States are considering to opt for a special borrowing window for meeting its compensation under GST (Goods and Tax Services).
- **Puducherry, Maharashtra, Gujarat, Karnataka, Goa, Himachal Pradesh, Bihar, Assam, Uttar Pradesh, Delhi, and Jammu and Kashmir opted for the special borrowing window followed by Rajasthan.**
- The other states that are yet to join are Kerala, Punjab, West Bengal, Chhattisgarh, and Jharkhand.
- The borrowing options are floated by the Central Government is to resolve the compensation deficit in the present financial year.
- The Central Government made the borrowing options very simple and with a low-interest rate.
- The estimated GST revenue shortfall for the current fiscal was Rs 3 Lakh Crore.

- Of the total revenue shortfall, the compensation cess collection is estimated to be Rs 65,000 crore.
- This left a compensation deficit of Rs 2.35 lakh crore.
- In the compensation deficit of Rs 2.35 lakh crore, Rs 1.1 lakh crore is the estimated shortfall on account of GST implementation.
- The rest is being estimated as the impact of the COVID pandemic.
- The Centre gave two options in August to the states which included borrowing Rs. 97,000 crore from the special window facilitated by the RBI or to borrow Rs 2.35 lakh crore from the market.
- The options have revised to Rs. 1.10 lakh crore and Rs. 1.8 lakh crore.
- The Ministry is in dialogue with the opposing states to join the scheme.

Special Window for Borrowing:

- The Centre will borrow the money from the market and will arrange the loans.
- The Centre will act as an intermediary to arrange loans for the payment of GST compensation shortfall of Rs 1.1 lakh crore to states.
- This arrangement will appear as capital receipts for the state government and for the Centre not as fiscal deficit.
- States like Kerala, Punjab, and Chhattisgarh ordered clarification and no-strings-attached to the borrowing mechanism.
- The states also expected inclusion of the balance compensation deficit amount beyond the proposed borrowing of Rs 1.10 lakh crore under the back-to-back borrowing mechanism.

Why could States not Borrow?

- States should tap the window separately for borrowing.
- The major concern for borrowing was that states, even if divided into groups they should tap the market for borrowing separately.
- This leads to differential rates with wide variance in the interest rates among the states with more debt and less debt.
- The major tool for market borrowing for the states is the State Development Loans (SDL).
- These are generally at a premium, higher than the yields of the Central government's securities.
- So for the states to borrow will be costlier when compared with Centre borrowing at a uniform rate and then passing it back as loans.

Progress of the Scheme:

- The Centre has already borrowed Rs 12,000 crore in two equal installments.
- These installments are passed on to 21 states and three Union Territories on October 23 and November 2.
- The interest rate of the second round of borrowing was at 4.42% and the first round of borrowing at 5.19% lower than the cost of borrowing for the States.
- Karnataka, Maharashtra, and Gujarat received total amounts of Rs 1,872 crore, Rs 1,808 crore, and Rs1,391 crore respectively.
- On October 23, the first tranche of the borrowing was done where the Centre borrowed and transferred Rs 6000 crore to 16 states and two UTs.
- The Ministry will release Rs 6,000 crore every week to the states.

15. OTT Platforms Now Under Government Control:

- The government, in a notification, has ordered all the digital platforms including entertainment, films, and news platforms to come under the ambit of the Union Ministry of Information and Broadcasting.
- The order was signed by the President on November 9, 2020.
- The order covers the digital and online media including films, audio and visual programs made available by online content providers, and news and current affairs content on online platforms.

- Under the legal framework of the Information Technology Act, 2000, comes the online content providers like Amazon, Hotstar, Netflix and news platforms.

Need for Government Control:

- A proper framework is needed, as there is a significant shift of viewership from traditional media platforms to digital media.
- At present, there are 560 million internet users on OTT platforms.
- With the prevalence of mobile phones and the possible threat to the young generation by the content on the OTT platforms can create, there is a need for regulating the content.
- Since 2019, more cases were filed in the Supreme Court and various high courts over unregulated content on the OTT platforms.
- According to a survey, India had 17 crore OTT platform users by the end of 2019.
- The revenue generated by the OTT industry in 2019 was close to Rs 500 crore and is expected to become a Rs 4000 crore market by 2025.
- Depending on the platform at present, there are autonomous, government, and self-regulatory bodies for entertainment and news providers.
- There is a Press Council for print media, which is a statutory quasi-judicial authority.
- For television news, there is the News Broadcasting Standards Authority which is a self-regulatory body.
- Under I&B Ministry, there is the Central Board of Film Certification, the Broadcasting Content Complaints Council which is self-regulatory and independent for television media, and the Advertising Standards Council which is a self-regulatory body.
- Any violation of the programming and advertising codes under the Cable Television Network (Regulation) Act, 1995, the I&B Ministry can penalize the television channels.
- With the help of the Electronic Media Monitoring Centre, complaints can be directly sent to the Ministry or through an internal mechanism.
- In November 2019, Government brought a draft Registration of Press and Periodicals Bill (RPP) which replaced the 150-year-old Press and Registration of Books Act, 1867.
- The draft defined the news on digital media as the news in the digitized format which includes the text, audio, video, and graphics that can be transmitted over the internet, computer, and mobile networks.
- A model was suggested by the Internet and Mobile Association of India (IAMAI) but the government rejected the model as it lacked independent third party-monitoring, a well-defined code of ethics, and did not enunciate the prohibited content.
- The government proposed a Digital Curated Content Complaints Council (DCCC).
- THE government prohibited the content which includes any malicious content that intends to outrage the religious sentiments, content that promotes or encourages terrorism, and content that has been banned for exhibition or distribution by law.
- In January 2019, 8 video streaming services has signed a self-regulatory code.

16. New Genus of Tree Frog Discovered:

- Researchers from the University of Delhi and the Zoological Survey of India (ZSI) discovered a new genus of tree frogs.
- The tree frogs are found in the Andaman Islands and the Northeast.
- The tree frog is named *Rohanixalus* after the Sri Lankan taxonomist Rohan Pethiyagoda.
- The frogs of the new genus have a small and slender body with a size of about 2 to 3cm.
- They have a pair of contrastingly coloured lateral lines on either side of the body with tiny brown speckles scattered throughout the upper body. The frogs lay eggs in arboreal bubble-nests which are light green.
- Using DNA sequencing, researchers have found that the new genus is the distinct evolutionary lineage from previously known tree frog genera.

- Scientists studied the external morphology of adults and tadpoles, calls, phylogeny and breeding biology of tree frog species.
- These frogs are distributed across South, Southeast and East Asia.
- The study was contributed by scientists from China, Indonesia and Thailand.
- The tree frog belongs to the family of Rhacophoridae is the 20th recognized genus that comprises 422 known Old World tree frog species that are found in Asia and Africa.
- There are 8 frog species in the genus Rohanixalus and are known to inhabit the forest as well as human-dominated landscapes.
- These are mostly found in the northeast, Andaman Islands, Thailand, Malaysia, Myanmar, Laos, Vietnam, Indonesia and Cambodia and Southern China.
- Rohanixalus vittatus (Stripped Bubble nest frog) is the first member of the tree frog family and is found on the Andaman Island.
- This research uncovers the new distribution pattern of tree frogs which provides evidence for faunal exchange between Andamans and the Indo-Burma region.

Feature of the New Tree Frog:

- The genus has a unique behavioural trait of maternal egg attendance.
- The female frogs watch over the egg clutches until tadpoles are hatched and the female frog assists the tadpoles into the water.
- The females sit over the eggs during the first three days after laying eggs.
- They produce a gelatinous secretion with which she glazes the egg mass through the clockwise movement of her legs.
- This produces necessary moisture to the eggs laid on exposed leaf surfaces and protects from insect predation.
- Field studies revealed that the frogs lay eggs in clutches and the researchers have founds eggs at various developmental stages on a single leaf or plant.
- The frogs all display territorial behavior and frequent male-male combats which involve pushing, kicking, and dislodging to successfully mate with the female.

17. Atmanirbhar 3.0 Announced:

- The government announced measures to support the economic recovery process, worth around Rs. 1.2 lakh crore.
- This is to boost job creation, encourage economic activity in housing and infrastructure areas, and provide liquidity support to stressed sectors.
- For fertilizer subsidy, an additional amount of Rs. 65,000 crore is provided.
- This will support the increasing demand on the monsoon and sharp increase in the crop sown areas.
- The other measures include extending the **Emergency Credit Line Guarantee Scheme (ECLGS)** to 26 sectors, funding for housing and infrastructure, a new scheme to promote job creation, and additional outlay for rural employment.
- In tax laws, changes are made to clear the unsold inventory of residential housing units up to Rs 2 crore.
- The government restrained itself from providing any direct financial support to sectors such as aviation and tourism.
- These are being given access to the government guaranteed collateral-free Rs 3 lakh crore loan scheme which was opened for MSMEs.
- Under the scheme, the companies which have the loan dues in Special Mention Accounts of 30 days as of February 29, 2020, will be provided with additional credit of 20%.
- Under the scheme, the entities in 26 stressed sectors identified by the Kamath Committee and the healthcare sector which has a credit outstanding of above Rs 50 crore and up to Rs 500 crore as of February 29 are eligible for funding.
- In April-June, the stressed sectors like trade, construction, hotels, and transport contributed 83.4% to the contraction in the service sectors.

- As per government data, the ECLGS scheme was extended up to November 30 and made disbursements of Rs 1.48 lakh crore against sanctions of Rs 2.03 lakh crore to 60.67 lakh borrowers.
- The new scheme can now utilize Rs 3 lakh crore and this can be enhanced as per the requirements.
- According to the Kamath Committee, the sectors that are under stress are retail trade, wholesale trade, roads, and textiles.
- The sectors under stress pre-COVID include NBFCs, power, steel, construction, and real estate.
- After COVID-19, the corporate sector debt worth is about Rs 15.52 lakh crore.
- Before the pandemic, Rs 22.20 lakh crore was already under stress.
- This means that Rs 37.72 lakh crore that is 72% of the banking sectors are under stress and 37% of non-food bank credit.
- The additional credit will be for five years along with one year of a moratorium on principal repayment and will be available up to March 31, 2021.
- Under the new Atmanirbhar Bharat Rozgar Yojana, a subsidy for the provident fund for adding new employees to establishments registered with the Employees Provident Fund Organisation (EPFO) will be provided.
- The scheme covers 99% of the establishments and 65% of all employees in the formal sectors.
- The central government provides a subsidy for two years to workers who lost their jobs between March 1 and September 30.
- The subsidy is also provided to the new workers employed after October 1.
- The government will pay PF of Rs 15,000 for workers with wages.
- The government provides 24% contribution for both employers and employees for establishments up to 1000 employees and 12 % for more than 1000 employees.
- If the establishment is for 50 or fewer employees, the scheme specifies that the subsidy will be provided for the employment of two new employees and will be paid for five new employees if establishments have more than 50 employees.
- The subsidy amount will be operational until June 30, 2021, and is credited only in the Aadhaar-seeded EPFO accounts (UAN) of new employees.
- Under Pradhan Mantri Awas Yojana (PMAY)- Urban, for housing and infrastructure sectors the government will provide Rs 18,000 crore.
- This scheme will help 12 lakh houses to be grounded and 18 lakh to be completed.
- For the government projects, the central announced to bring down the earnest money deposit and performance deposit on government tenders.
- The security deposit on performance is reduced 3% from around 5-10% and EMD is not required.
- The relaxation is valid till December 31, 2021.
- The construction sector will be free from the capital and will enhance its financial ability.
- Now, the developers can sell their housing units at 20% lower than the circle rate.
- This benefit is available only on primary residential units with a value up to Rs 2 crore until June 30, 2021.
- To support the debt financing, the government will provide Rs 6,000 crore of equity in the National Investment and Infrastructure Fund (NIIF).

18. Meteor Lake is now a Ramsar Site:

- The meteor lake at Lonar in Buldhana district, Maharashtra is declared as a Ramsar site.
- The conversion status is given by the International Ramsar Convention on Wetlands.
- The meteor lake is part of the Lonar Wildlife Sanctuary.
- This is the second Ramsar site in the state of Maharashtra.
- The first one was the Nandur Madhmeshwar Bird Sanctuary in the Nashik district. It was declared a Ramsar site in January 2020.
- This lake was situated in the Deccan Plateau's volcanic basalt rock.
- This was created by the impact of a meteor 35,000 to 50,000 years ago.
- Lonar lake water is highly alkaline and salty.

- The lake water also contains special microorganisms like anaerobes, cyanobacteria, and phytoplankton.
- The Lonar lake site also has 160 birds, 46 reptiles, and 12 mammal species.
- The status is achieved by the continuous efforts of a team led by the Field Director of Melghat Tiger Reserve which controls the Lonar Wildlife Sanctuary.
- Now, the lake will benefit from the international publicity and financial aid through the convention grant.

Ramsar Site:

- A Ramsar Site is a wetland site that gives international importance.
- The Ramsar site is under the Ramsar Convention which is an international environmental treaty established by UNESCO in 1971.
- The Ramsar site provides national and international cooperation regarding the conservation of wetlands and sustainable use of the resources.
- In India, there are 41 Ramsar sites.

RAMSAR WETLANDS SITES (As on December, 2020)

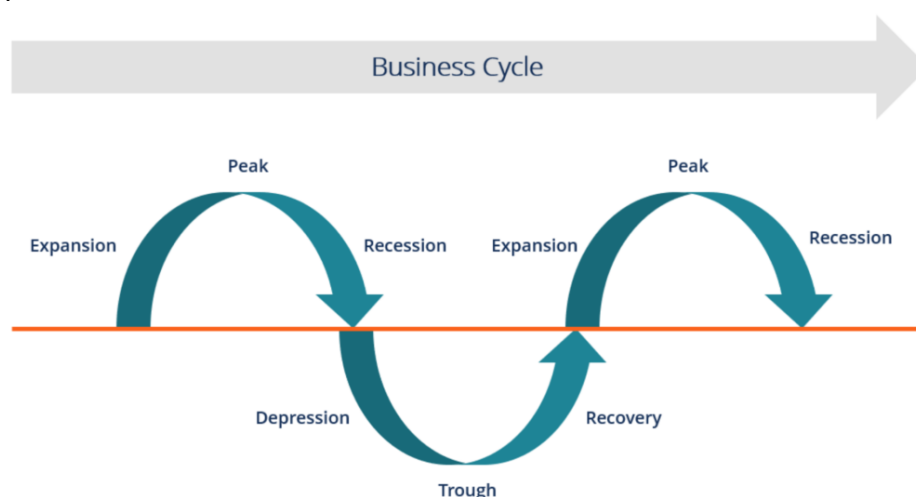
Sl. No.	Name of Site	State Location
1	Asan Conservation Reserve	Uttarakhand
2	Asthamudi Wetland	Kerala
3	Beas Conservation Reserve	Punjab
4	Bhitarkanika Mangroves	Orissa
5	Bhoj Wetlands	Madhya Pradesh
6	Chandertal Wetland	Himachal Pradesh
7	Chilka Lake	Orissa
8	Deepor Beel	Assam
9	East Kolkata Wetlands	West Bengal
10	Harike Lake	Punjab
11	Hokera Wetland	Jammu and Kashmir
12	Kabartal Wetland	Bihar
13	Kanjli Lake	Punjab
14	Keoladeo Ghana NP	Rajasthan
15	Keshopur-Miani Community Reserve	Punjab
16	Kolleru Lake	Andhra Pradesh
17	Loktak Lake	Manipur
18	Lonar Lake	Maharashtra
19	Nalsarovar Bird Sanctuary	Gujarat
20	Nandur Madhameshwar	Maharashtra
21	Nangal Wildlife Sanctuary	Punjab
22	Nawabganj Bird Sanctuary	Uttar Pradesh
23	Parvati Agra Bird Sanctuary	Uttar Pradesh
24	Point Calimere Wildlife and Bird Sanctuary	Tamil Nadu
25	Pong Dam Lake	Himachal Pradesh
26	Renuka Wetland	Himachal Pradesh
27	Ropar Lake	Punjab
28	Rudrasagar Lake	Tripura
29	Saman Bird Sanctuary	Uttar Pradesh
30	Samaspur Bird Sanctuary	Uttar Pradesh
31	Sambhar Lake	Rajasthan
32	Sandi Bird Sanctuary	Uttar Pradesh
33	Sarsai Nawar Jheel	Uttar Pradesh
34	Sasthamkotta Lake	Kerala
35	Sunderbans Wetland	West Bengal
36	Surinsar-Mansar Lakes	Jammu and Kashmir
37	Sur Sarovar	Uttar Pradesh
38	Tsomoriri Lake	Jammu and Kashmir
39	Upper Ganga River (Brijghat to Narora Stretch)	Uttar Pradesh
40	Vembanad Kol Wetland	Kerala
41	Wular Lake	Jammu & Kashmir

19. All About Technical Recession:

- In its monthly bulletin on State of the Economy, the Reserve bank of India (RBI) has dedicated an entire chapter on technical recession terming that India is currently facing a technical recession.
- The RBI came up with this idea to provide a snapshot of some of the key indicators of India's economic state.
- The RBI started the prediction of the present or the near future of the state economy.
- The RBI predicts that India's economy will contract by 8.6% in the second quarter that is July, August, September of the current financial year.
- During the first quarter(April, May, and June) the economic contraction was considerably slower at a -23.9% decline in the real gross domestic product (GDP).
- The contraction of Q2 is crucial as it implies India has entered a **"Technical Recession"** in the first half of 2020-21 and is the first time in history.

What is the Recessionary Phase?

- When the overall output of goods and services is measured by the GDP then an increase in the economy from one quarter to another is said to be an expansionary phase.
- The recessionary phase is the counterpart of an expansionary phase where the GDP contracts from one quarter to another.
- In any economy, these two phases create a business cycle and this cycle can be anywhere between one year and a decade.
- When this recessionary phase sustains for a longer period it is called a recession.
- The definition of recession according to the National Bureau of Economic Research (NBER) is a significant decline in economic activity spread across the economy and can last from a few months to more than a year.
- The Data Committee of NBER looks at various variables for the business cycle apart from GDP growth includes employment, consumption, depth, duration, and diffusion etc.,
- What is a Technical Recession?
- The generally accepted definition for recession is a significant contraction in economic activity.
- But, there are many questions about whether to accept economic activity alone to measure recession.
- It is possible to measure a recession based on unemployment or personal consumption. Because, at times, GDP starts growing even as the unemployment rate is not falling.
- When NBER declared 2009 would be the end year for the recession, but many metrics did not recover for a long time. For example, the non-farm payroll employment did not reach its previous peak until 2014.
- Economic commentators get around these technicalities by considering the recession to be in progress when the GDP in two consecutive quarters has declined.
- Thus, a technical recession is declared by considering real quarterly GDP as a measure of economic activity.



India's Technical Recession:

- Most economists expected that the Indian economy would go into recession when the lockdown was announced.
- The economists estimated that the economy may contract for at least one more quarter from October to December.
- Recessions may last for a few quarters and when continued for years they are called depressions.
- Depressions are very rare and occurred in the US during the 1930s.
- At present, the main factor for an economy to come out of recession is to control the COVID-19.
- The finance minister hopes for positive growth in the current quarter.

20. Discovery of New Vine Snake Species:

- Research from the Centre for Ecological Sciences (CES) and the Indian Institute of Sciences (IISc) discovered new vine snake species in peninsular India.
- Researchers collected extensive samples across peninsular India and even in peri-urban areas.
- Researches carried field visits across India to collect morphological data, specimens, and tissue samples.
- This made them understand the patterns of distribution and diversification of vine snakes.
- Researchers from the Chennai Snake Park and the Bombay Natural History Society (BNHS) also collaborated on the study.
- Researchers founded that the common green vine snake (*Ahaetulla nasuta*) in India has a complex of species.
- Researchers found four different small-bodied and short-nosed species.
- The vine snake species that were found in the Northern Western Ghats are *Ahaetulla nasuta*, Fransworth's vine snake - *Ahaetulla farnsworthi*, Malabar vine snake - *Ahaetulla malabarica*. Wall's vine snake - *Ahaetulla isabellina* was found in the Western Ghats rainforests.
- These were similar in their morphology but separated by geographic or ecological barriers.
- Researchers also delineated the Travancore vine snake - *Ahaetulla travancorica*.
- The Gunther's vine snake - *Ahaetulla dispar* is separated by morphology and a geographical barrier.
- They recognized the morphological distinctions between the brown vine snake in the Western Ghats and one that is found in Sri Lanka.
- Scientists named the new snake species as *Ahaetulla sahyadrensis*.
- Now there are six species of vine snakes in the Western Ghats.

Vine Snakes:

- Vine snakes are commonly found in peninsular India, peri-urban areas, and in the Western Ghats.
- The Asian Vine Snakes are distributed throughout the continent.
- They belong to the genus *Ahaetulla* and recently described as *Proahaetulla*.

21. Protein Structure that Helps Coronavirus Replicate Studied:

- Researchers from the **Massachusetts Institute of Technology** described the molecular structure of a protein found in SARS-CoV-2.
- The protein is named **envelope protein E**.
- **The protein is the reason for the host cell's inflammation response and has a major role in virus replication.**
- Researchers indicated that if the pathway of the virus is blocked, it helps to reduce the pathogenicity of the virus and interfere with viral replication.
- Researchers identified the binding sites of two drugs that block the channel.
- But these drugs bind weakly and are not effective inhibitors of the E protein.
- Researchers identified that the E protein is made of several helical proteins.

- In two-and-a-half months, researchers were able to clone and purify the E protein.
- For two months, they analyzed it with nuclear magnetic resonance (NMR) spectroscopy.
- The study showed that the part of E protein assembles into bundles of five helices.
- The helices create a tight channel and remain immobile within this bundle.
- Researchers identified several amino acids at one end of the channel.
- This may attract positively charged ions such as calcium into the channel.
- The researchers are in the hope to determine the structure of the open state.
- This may explain how the channels are open and close.
- Researchers found that the two drugs amantadine which is used to treat influenza and hexamethylene amiloride which is used to treat high blood pressure can block the entrance of the E channel.
- Researchers say that if stronger inhibitors were developed, they can act as a potential drug to treat COVID-19.

22. Vulture Action Plan 2020-25:

- For the conservation of vultures in the country, the Union Minister for Environment, Forests and Climate Change launched a **Vulture Action Plan 2020-25**.
- Since 1990, India saw a steep decline in the vulture numbers and is one of the drastic declines of bird populations in the world.
- Since 2006, the Ministry has been carrying a conservation project for vultures and now the project is extended to 2025.
- The main focus of the project is to halt the decline and also acts to increase the vulture population.
- In the country, there are nine recorded species of vulture.
- The species are the Oriental white-backed, slender-billed, Himalayan, long-billed, red-headed, Egyptian, bearded, Eurasian Griffon and cinereous.
- The critically endangered species are the Oriental white-backed, long-billed, slender-billed and red-headed vultures.
- Between 1990 and 2007, the critically endangered species crashed massively with 99% of them wiped off.
- Now, there is a decline in the red-headed vultures with a decline of 91% and Egyptian vultures by 80%.
- The Egyptian Vultures are listed as the endangered species.
- While the Himalayan, bearded and cinereous vultures are listed as 'near threatened'.
- The cause for the crash in the vulture's population came into limelight in 2004.
- The cause of the crash is due to a drug called diclofenac.
- Diclofenac is a veterinary nonsteroidal anti-inflammatory drug (NSAID) used to treat inflammatory diseases like gout and pain.
- The vultures would feed on this type of carcass.
- To eliminate 99% of the vulture populations, 0.4-0.7% of animal carcasses contaminated with diclofenac is sufficient.
- In 2006, the MoEFCC launched the Action Plan for vulture conservation.
- In the same year, DCGI banned the use of diclofenac.
- The Vulture Conservation Breeding Programme was established by the Central Zoo Authority (CZA) and Bombay Natural History Society (BNHS).
- Now this centre has three critically endangered species that are bred in the captivity.
- At present, there are 8 centres and 396 vultures of the three species are present.
- Now the ministry has launched the conservation programme for the redheaded and the Egyptian vultures.
- At 8 different places in the country, the Vulture Safe Zone Programme is implemented and two in Uttar Pradesh.
- By ensuring the minimum use of diclofenac, attempts are made to secure the vultures.

- When no toxic drugs are found in the pharmacy and cattle carcass surveys for two consecutive years and when there is no decline in the vulture population, then the area will be declared as a Vulture Safe Zone.
- The action plan aims to ensure that the sale of veterinary NSAIDs are regulated and livestock treated by qualified veterinarians.
- The Ministry is planning to develop safe NSAIDs on vultures.
- Additional Conservation Breeding centres are also being planned, one each at Uttar Pradesh, Tripura, Maharashtra, Karnataka and West Bengal.
- In the Vulture Conservation centres, samples and information can be collected from the wild, can be analysed and stored.
- Four Rescue Centres have been proposed in Pinjore in the north, Guwahati in the Northeast, Bhopal in Central India and Hyderabad in South India.

23. Regional Comprehensive Economic Partnership:

What is RCEP?

- RCEP is a Regional Comprehensive Economic Partnership.
- At present, it is the largest regional trading agreement.
- RCEP has been negotiated between 16 countries which includes ASEAN members and countries with which they have free trade agreements (FTAs).
- The free trade agreement countries are **China, Korea, Australia, Japan, New-Zealand and India.**
- The main motive of this agreement is **to make it easier for the products and services of these countries and to be available across this region.**
- Since 2013, negotiations were made to chart out this deal and India was expected to be the main member.

Why Did India Walk Out?

- On November 4, 2019 India decided to exit the discussions on significant outstanding issues.
- The reason behind this, India has been consistently raising fundamental issues and concerns throughout the negotiations.
- They had not resolved by the deadline to commit to signing the deal.
- India decided to safeguard the industries like agriculture, dairy and the service sectors.
- The current structures of RCEP do not resolve these issues and concerns.
- One more reason is the presence of China.
- India was uncomfortable with its commitments under RCEP, as it has taken various measures to reduce its exposure to China.
- The unresolved issues during the RCEP were related to the exposure that India would have to China.
- There were inadequate protections against surges in imports.
- India will be unable to establish countermeasures to raise tariffs on products when their imports extended a certain threshold if it had joined the RCEP.
- India also wanted RCEP to exclude Most Favoured Nation (MFN) obligations from the investment and also extend benefits to the member countries for sensitive sectors like defence.
- RCEP lacked clear assurance on market access issues in countries like China and non-tariff barriers on Indian Companies.

Impact on India:

- India's decision would impact its bilateral ties with RCEP member nations.
- This will leave India with less scope to tap the large market that RCEP represents.
- The member countries may incline to focus on bolstering economic ties with the blocks.
- India's decision could also impact the Australia-India-Japan network in the Indo-Pacific.
- It may halt the talks to promote a **Supply Chain Resilience Initiative** among the three countries.

- According to an assessment, the growth in trade, CAGR with the members for the past five financial years was only 7.1%.
- But there has been a growth rate in both imports and exports to these FTA partners.
- The utilization rate of FTAs with India was moderated with partners like Bhutan, Thailand, Afghanistan, Singapore, Sri Lanka, Japan, Nepal, Republic of Korea and Malaysia.
- With 11 of the 15 RCEP countries, India has trade deficits.

India's Option:

- India has the option of joining the agreement without having to wait 18 months as stipulated for new members.
- The possible alternative may be exploring its existing bilateral FTAs with RCEP members.
- India has agreements with ASEAN bloc, South Korea and Japan.
- India is negotiating with members like New Zealand and Australia.
- Some other agreements are the India-Singapore CECA, the India-Bhutan Agreement on Trade Commerce and Transit, the India-Nepal Treaty of Trade.
- India is negotiating bilateral agreements with the US and the EU.

24. SC's Observations on Article 32:

- Supreme Court observed that it is trying to discourage individuals from filing the petitions under Article 32.
- The observation came during the hearing of the petition for the release of journalist Siddique Kappan.

What is Article 32?

- Article 32 is the 'Right to Constitutional Remedies'.
- It is one of the fundamental rights of the Constitution.
- It affirms the right to move to the Supreme Court for the enforcement of the rights conferred in Part III of the constitution.
- Under the article, Supreme Court will have the power to issue directions or orders or writs, including writs like the nature of habeas corpus, mandamus, prohibition, quo warranto, and certiorari whichever is appropriate for enforcement of any of the rights conferred by this part.
- The right guaranteed by Article 32 shall not be suspended except otherwise provided by the Constitution.
- Article 32 is included in Part III with the other fundamental rights which included the right to Equality, Freedom of Speech and Expression, Life and Personal Liberty, and Freedom of Religion.
- A person can directly approach the Supreme Court under Article 32 only when any of these fundamental rights are violated.
- Dr. B R Ambedkar said that this Article is the soul of the constitution and the rights invested in the Supreme Court could not be taken away unless the constitution itself is amended.
- This Article cannot be suspended except during the Emergency.

Role of High Courts:

- The High Courts and Supreme courts can be approached for violation of fundamental rights through five kinds of writs:
 - **Habeas corpus**- related to personal liberty in case of illegal detention and wrongful arrests.
 - **Mandamus**- directing public officials, governments, courts to perform a statutory duty.
 - **Quo warranto**- to show by what a warrant is a person holding public office.
 - **Prohibition**- directing judicial or quasi-judicial authorities to stop proceedings for which it has no jurisdiction.
 - **Certiorari**- a re-examination of an order given by judicial, quasi-judicial, or administrative authorities.
- In civil or criminal matters, the first option available to an aggrieved person is that of the trial court.

- This is followed by an appeal in the High Court and then in the Supreme Court.
- An individual can approach the High Court under Article 226 of the Supreme Court directly under Article 32.

Supreme Court Observations on Article 32:

- In many cases, the Supreme Court directed the petitioners to go to the High Courts first.
- The Supreme Court observed that once a competent court had taken initiative, it was under the authority of that court to decide on the matter.
- The Supreme Court said that Article 32 provides a guaranteed remedy for the enforcement of fundamental rights.
- The court observed that 'the court is constituted the protector and guarantor of fundamental rights and refuses to entertain applications seeking protection against infringements of such rights.

25. Chapare Virus - Is It A Threat to Humans?

- Chapare virus is a rare Ebola-like illness that originated in rural Bolivia in 2004.
- This virus can transmit from human to human.
- It was discovered by researchers from the US's Centre for Disease Control and Prevention (CDC).
- In 2019, the Chapare virus was reported in the Bolivian capital of La Paz when three healthcare workers contracted the illness from two patients.
- Later, two medical professionals and one patient died.
- Before 2019, a single confirmed case and a small cluster were recorded in the Chapare region a decade ago.
- Now, researchers at the US CDC are studying the virus to see if it is a threat to mankind.

What is the Chapare Virus?

- Chapare virus is a hemorrhagic fever (CHHF).
- It is caused by the arenavirus family which also causes the illness Ebola virus disease (EVD).
- Arenaviruses are carried by the rats and transmitted through direct contact with the infected rodent, its urine, and droppings, and contact with the contacted person.
- The virus is named Chapare after it was first observed in this region.
- Similar to the Ebola virus, the Chapare disease causes hemorrhagic fever, abdominal pain, vomiting, pain behind the eyes, gums bleeding, and skin rash.
- Hemorrhagic fever is a severe and life-threatening illness that affects multiple organs and also damages the walls of blood vessels.

Discovery by CDC researchers:

- The new findings were presented by the Researchers from CDC at the annual meeting of the American Society of Tropical Medicine and Hygiene (ASTMH).
- The researchers discovered that the **virus can spread from person to person and especially in healthcare settings, the transmission is high.**
- Based on the research, **healthcare workers are at higher risk of contracting the illness.**
- They should be extremely cautious with patients and should avoid contact with contaminated items such as blood, urine, saliva, or semen.
- Researchers found the fragments of genetic entities known as RNA which is associated with Chapare.
- This was discovered in the semen of one survivor 168 days after he was infected.
- Researchers also confirmed that the disease is sexually transmitted.
- **The rodent species which hosts the Chapare virus is commonly known as pigmy rat and is found across Bolivia and neighboring countries.**

- CDC researchers are using new sequencing tools to quickly develop an RT-PCR test like the one used to diagnose Covid-19.

Treatment for the Virus:

- There are no specific drugs for the treatment of the Chapare.
- Patients generally receive intravenous fluids as supportive care.
- Researchers recommend maintaining hydration, management of shock through fluids resuscitation, sedation, pain relief, and transfusions as the supportive therapy.

The threat by Chapare Virus:

- Researchers say that the virus is more difficult to catch as it spreads through direct contact with bodily fluids.
- The disease is known to be commonly transmitted in more tropical regions particularly in parts of South America.

Is It A Threat to India?

- As we are witnessing with the coronavirus pandemic, in the globalized world, a virus with potential human to human transmission is a threat. India, being a tropical country and vastly populated, will have serious consequences if cheaper has to transmit in the country.
- Identifying such diseases early and being vigilant over their spread is the first step in restricting the spread of the disease.
- On its part, the government of India must invest in research of such rare diseases to protect its citizenry. Unlike what we have seen with the COVID-19 pandemic, such research efforts will give a better chance at fighting the next pandemic early.

26. Willow Warbler Spotted:

- Researchers have spotted for the first time in India the **Willow Warbler**.
- The Willow Warbler was spotted for the first time in India.
- The **Willow Warbler bird** was spotted on November 14 by the **researchers from the National Service Scheme (NSS) of Sree Gurukul College and Research Foundation, Venjaramoodu**.
- **The bird was sighted in the country in Thiruvananthapuram, Kerala.**
- The researchers recorded **17 species of warblers from Kerala** and the **Willow warbler forms the 18th warbler.**
- **With the inclusion of Willow Warbler, Kerala is now home to 533 bird species.**
- The **Biodiversity hotspot** of the birds is the **Vellayani-Punchakkari paddy fields** on the outskirts of Thiruvananthapuram.
- This biodiversity hotspot harbors more than 213 species of birds which includes both resident and migratory birds.

About Willow Warbler:

- The **scientific name of the Willow Warbler bird is *Phylloscopus trochilus*.**
- It is one of the **longest migrating small birds from northern and temperate Europe.**
- These birds are found throughout northern and temperate Europe and the Palearctic.
- These birds have unique behavior, shape, and non-familiarity with other warblers.
- The bird weighs around 10g and can fly long distances as it has long wing feathers.
- These birds migrate to sub-Saharan Africa during early winter.
- Warblers are difficult to identify because of its small size and change in plumage twice a year.

- They are also difficult bird groups to identify in the field for their striking resemblance to each other.

Birds in Kerala:

- Of the 1330+ bird species found in the country, Kerala is home to 533 species including the newly found Willow Warbler.
- Many of these are endemic to the State and new species are still being discovered.
- The evergreen forests and the wetlands of Kerala are the perfect home for birds and hence the species richness in the state.
- Thus, BirdLife International, an international non-governmental organisation, identified Kerala as an Important Bird and Biodiversity Area of the world.

27. Oxford Vaccine Results:

- In phase 2 clinical trials, the Oxford-AstraZeneca Covid-19 vaccine has triggered a robust immune response in older adults.
- The vaccine showed potential usefulness in protecting a section of the population who are among the high risk of novel Covid-19.
- Preliminary findings showed that the vaccine has been safe, well-tolerated, and to produce a similar immune response across the age groups after booster vaccination.
- Scientists from the University of Oxford and the British-Swedish pharma giant AstraZeneca named the vaccine as ChAdOx1 nCov-2019.
- For Covid-19 vaccination, the older adults are a priority group as they are at high risk of disease.
- The vaccine was tolerated in the older patients and stimulated immune responses in the younger volunteers.
- The next trial will be seen if the vaccine translated into protection from the disease itself.
- In India, this vaccine results are important as it is being put through phase 3 trials by the Pune based vaccine manufacturer Serum Institute India (SII) and the Indian Council of Medical Research (ICMR).
- SII has already manufactured more than 40 million doses of the vaccine candidate.
- The vaccine is manufactured under an at-risk manufacturing and stockpiling license from the Drugs Controller General of India (DCGI).
- SII will be supplying India's domestic requirement of the vaccine.
- In early results of phase 3 trials, Pfizer-BioNTech and Moderna have reported well over 90% efficacy for their mRNA vaccine candidate.
- The Russian Sputnik V candidate has also reported good phase 3 trial results.
- During the phase 2 trials of the Oxford-AstraZeneca vaccine, two doses were given in the form of ChAdOx1 or a placebo MenACWY.
- It was evaluated in 560 healthy adult volunteers in the age groups of 18-55 years, 56-69 years and 70 years and older.
- Local and systematic reactions were common in participants who were given ChAdOx1 nCoV-19 than in those given the control vaccine.
- The severity of the symptoms reported in the standard-dose groups was reduced after the boost of the vaccine.
- After the prime vaccination, only one per cent of 127 participants reported a severe reaction compared with five per cent of 128 participants.
- After a single dose, the vaccine candidate induced specific antibody response to the SARS-CoV-2 spike glycoprotein.
- The T-cell peaked after 14 days after the prime vaccination.

- The robust humoral and cellular immune responses obtained in the older adult population gave encouraging results.

28. Australia to Support ISRO:

- In a show of deepening civil space cooperation between India and Australia, the Australian space agency will temporarily set up an Indian positioning system in the country.
- This will help India to track its human space flight when it is launched.
- India's Gaganyaan mission aims to send an Indian to space by 2022 and the hosting of tracking facilities will give a boost to the efforts of ISRO.

The Cooperation:

- At Bengaluru Tech Summit 2020, the Australian Minister for Industry, Science and Technology said that the Indian Space Flight Programme will be a great opportunity for both countries to collaborate and cooperate in earth observation, data analytics, space life sciences and robotics.
- The Minister noted that India would become only the fourth country in the world to send a crew to space.
- With the cooperation, the space agencies of both the countries as well as the industry and research organisations will have significant opportunities.
- The Australia-India space cooperation became formal by the signing of a Memorandum of Agreement in 2012.
- Since 1987, both the countries have been collaborating in space efforts with Australia helping India in data calibration and laser ranging for Indian satellites and India launching Australian satellites and undertaking joint research.
- The cooperation strengthened further when both the countries elevated their bilateral relationship to a Comprehensive Strategic Partnership (CSP).
- With the CSP, the countries entered into formal agreements in space cooperation, cybersecurity, emerging technologies and critical minerals.

Research Funding:

- The Minister also announced that the Australia-India research fund has been extended to another four years and the budget has been increased to \$15 million.
- The fund will facilitate cooperation between researchers on strategically focused, leading-edge science and technology projects.
- The fund has been in operation since 2006 and is Australia's largest bilateral science programme.
- Since 2006, Australia has committed nearly \$100 million through the fund.
- Both countries have also concluded a framework arrangement on cyber and cyber-enabled critical technology cooperation.
- With the framework, both countries will collaborate to promote and preserve an open, free, safe and secure Internet.

29. Reasons Behind India Staying Away From RCEP:

- There is much debate on India's decision to stay away from the Regional Comprehensive Economic Partnership (RCEP), a 15 member-trade grouping which accounts for 30% of world GDP.
- RCEP is one of the largest Free Trade Agreements in the world.
- The ASEAN Bloc and Japan, China, South Korea, Australia, and New Zealand are part of RCEP.
- India has FTAs with the ASEAN group, Japan, and South Korea and India's trade deficit with these countries rose sharply since the FTAs.

- Between 2011 and 2019, the trade deficit with ASEAN rose from \$5 billion to \$22 billion. With Japan, it rose to \$8 billion from \$4 billion and with South Korea, it increased to \$12 billion from \$8 billion.
- Even without signing an FTA with China, India's trade deficit with that country now stands near \$50 billion. In 2005-06, the trade deficit with China was \$4 billion. As of 2020, the trade deficit is \$48.64 billion, which is better than \$53.56 billion in 2018-19.
- This means FTAs could be one of the reasons for India's decision to not join RCEP.

Are Trade Deficits Increasing?

- But, some experts counter the trade deficit argument.
- In a 2019 paper titled 'India's Trade Agreements and the Future of Indian Trade Policy', it was found that though India's trade deficit in all foreign trade is increasing, FTAs or Preferential Trade Agreements accounted for 12.6% of the overall deficit in 2007 and in 2017 it accounted for only 7.5%.
- Another argument for the growing trade deficit is due to India's declining manufacturing share in the GDP since 2016.

COVID-19 and the RCEP Debate:

- The global economy is under severe strain due to the COVID-19 pandemic. Nearly every RCEP country is facing a recession.
- With travel restrictions in place, countries are forging limited travel ties with others in the form of travel bubbles.
- Also, with the anti-globalisation trend gaining pace, countries are looking at limited trade partnerships outside the World Trade Organisation (WTO).
- Amidst this, China, being the second largest economy in the world and unlike others has a growing economy, is offering investments to RCEP countries.
- During the same time, the border confrontation between India and China on the Ladakh border had further bolstered India's decision to keep away from RCEP.
- India perceives China to be unreliable.

Some Countries Want India to Join:

- Still, some RCEP countries want India to join the trade partnership.
- Japan and Australia consider India as a counter to China owing to India's large economy.
- These countries believe that with the presence of India, they can negotiate better.
- Because of this, Japan took the initiative to draft a special clause in the RCEP where it allows India to join the grouping without waiting for 18 months (this is mandatory for any country to join the grouping).
- For ASEAN countries, the presence of India will give centrality to the ASEAN group which has negotiated the RCEP.
- China too would like to see India under the RCEP ambit as it will open India's market for it.
- The big question is how will the Quad countries manage their supply chains as India stays away from RCEP and the US walking away from Trans-Pacific Partnership.

Did RCEP Meet India's Concerns?

- India was concerned over Chinese goods flooding Indian markets via other countries. It demanded clear guidelines for rules of origin.
- In the final RCEP text, a whole chapter is dedicated to the issues which meet India's concerns.
- Also, many other issues that India had raised will be sorted out in the next few years as the RCEP countries negotiate on the issues.
- Yet, India is determined to not join the grouping.
- According to the Ministry of External Affairs, even if India is invited to be an observer at the grouping, India will not consider it.

- The reason, as per the Ministry is that the past trade agreements have locked India into global commitments and had led to the deindustrialisation of some sectors which were clearly a disadvantage to India.
- Further, the Ministry noted that rather than suffer trade deficits, India will try to solve its own problems.

30. Children Health Is Being Adversely Affected by Air Pollution – Study:

- A two-year-long study has found that the instances of children going to emergency rooms (ER) for respiratory illnesses due to air pollution are on the rise in the country.
- According to the study, there is a correlation between ER visits by children and a spike in air pollution levels.
- It was found that the cause of the respiratory illness is not due to Particulate Matter 2.5 or PM10, but due to nitrous oxide and sulphur dioxide.
- So far, studies have shown the relation between air pollution and its adverse impacts on health. But, the specific impact of nitrous oxide or sulphur dioxide has not been studied.
- The new study conducted by researchers from AIIMS, CSIR-Institute of Genomics and Integrative Biology, Kalawati Saran Children's Hospital and Vallabhbai Patel Chest Institute is not yet peer-reviewed and is available as a preprint on 'medRxiv'.

The Findings:

- Studies have previously found that the impact of air pollution is severe in children than in adults as the lungs of children are not fully developed which makes them vulnerable to lung inflammation and oxidative stress.
- Also, children retain more air pollutants per unit body weight than adults due to higher respiration rates and outdoor physical activity.
- The authors of the study noted that when the levels of pollutants nitrous oxide and sulphur dioxide spiked, there was an increase in ER visits by children.
- Nitrous oxide and Sulphur dioxide are predominantly released from vehicular exhaust and industrial processes.
- Over two years between June 2017 and February 2018, the study analysed hospital visits of 19,120 children.
- It was found that there was a rough increase of 21-28% by children manifesting symptoms of acute respiratory disease during days of 'high' and 'moderate' level pollution, compared to days of 'low pollution'.
- The researchers compared day-wise ER admissions of children with the levels of PM10, PM2.5, Ozone (O₃), Nitrous Oxide (NO), Sulphur Dioxide (SO₂), and carbon monoxide (CO).
- The children aged between 5 months and 3 years were studied.
- The key findings of the study were that the ER visits increased corresponding to the increase in SO₂ and CO.
- But, the traditional pollutants PM10 and PM2.5 which were considered as the biggest threat to health had contrary results. When there is a spike in the levels of these visits there were less ER admissions.
- It was also observed that the ER visits increased over the days preceding pollution spikes, which shows the direct impact of air pollution in exacerbating the respiratory illness.
- The study was conducted in Delhi where pollution rises in winter.

31. New Species of Gecko in the Eastern Ghats:

- The smallest Indian gekkonid, a new species of the lizard has been discovered in the Eastern Ghats.
- The species belonged to the genus *Cnemaspis*.
- Currently, there are 45 diverse species of *Cnemaspis* of which 34 are from the Western Ghats.
- The newly discovered species is known as the dwarf gecko (*Cnemaspis avasabinae*).

- This is the 12th species to be discovered outside the Western Ghats.
- This is the first species reported from the Velikonda Range of Andhra Pradesh.
- The new species discovery suggests that the genus may be widely distributed than previously thought.
- *Cnemaspis* belongs to the group of gecko which is very diverse and widespread over peninsular India.
- Researchers said that the species may have widely spread in each hill range or isolated forest patch.
- The new species was found in the Eastern Ghats which shows that the area is tremendously biodiverse.
- The common name of the new species is named as Sabin's Nellore dwarf gecko.
- The new species was found in the dry evergreen forest among the rocks beneath a small stream.
- The species was found at a height of fewer than 200 meters above sea level and measured less than 2.9 cm.
- The reptile is of the dorsal color of the head, body, and tail is in grey-pink with six pairs of dark brown patches.
- The males of the species lacked the femoral spores.
- Most of the lizards have femoral spores in both sexes.
- These secretions from the spores play a major role in communication.
- Without femoral pores doesn't mean that the male gecko is not adequately supplied with chemical means of communication.
- Geckos can release pheromones to attract or communicate with possible mates.
- Pores are useful for lizards to maintain a home range or territory and to keep away other males and to attract females.
- *Cnemaspis* have good vision and visual signaling may play a part in mate attractions.

32. RT-LAMP- For Covid-19 Detection:

- New technology for the detection of Covid-19 called **RT-LAMP**.
- As there is no vaccine for Covid-19 infection there is a strong need for rapid, specific, and sensitive SARS-COV-2 detection technology to control and contain the virus.
- RT-LAMP method is an ideal method for diagnosis as it is simple, speed, and cost-effective.

Current Method:

- The current method for SARS-COV-2 diagnosis is the RT-PCR (real-time reverse transcription-polymerase chain reaction).
- This test detects the presence of viral nucleic acids in nasopharyngeal swab samples.
- But PCR test requires complex, costly equipment and requires extensive training for potential users.
- The sensitivity and specificity of the test is about 95% and there is a possibility of false-negative results.
- The turnaround time is about 10 hours and the result will be available only the next day.
- In the remote areas, the turnaround time may increase further depending on the distance the samples need to travel.
- To detect antigens, COVID-19 serology tests are also used.
- The serology tests are easy to use with rapid results and have minimal expenses.
- The serology immunoassay lacks the necessary accuracy due to its low sensitivity and high false-negative rates.
- For one cycle, the RT-PCR test requires different temperatures.
- The temperature of the solution has to be changed from 92 degrees C to 56 degrees C and 72 degrees C for every two minutes and this cycle has to be done repeatedly.
- So, the PCR test requires an expensive thermal cycler and also real-time PCR machines.

RT-LAMP:

- RT-LAMP is a Reverse Transcriptase loop-mediated isothermal amplification technology.

- This test is a one-step nucleic acid amplification method.
- This can multiply specific sequences of RNA of the coronavirus.
- By reverse transcription, the RNA is first made into cDNA (copy DNA).
- The DNA is then amplified with the LAMP technology.
- This technique is new to the Indian IVD industry but it has been used in western countries for the past five years.
- In the RT-LAMP test, the temperature required is 65 degrees C and the DNA amplification is done at constant temperatures.
- The quantity of DNA amplified in the LAMP technology is a hundred thousand times more than in PCR.
- The final assay is possible with a simple reaction and also removes the need for costly real-time PCR machines.
- The assay is so fast in the LAMP technology and can obtain the results within 30 minutes and the positive samples are amplified as early as 10 minutes.
- This test can report with accuracy in substantially lower turnover time.
- The reagents in the LAMP tests are to be stored at 4 degrees C.
- The LAMP technology does not need laborious preparations and does not require complex expensive equipment.
- LAMP test is cost-effective and the assay can be performed with minimum skill and infrastructure.
- LAMP technology has many advantages when compared with other tests.
- The Indian Council of Medical Research validated the LAMP technology with a sensitivity of 98.75% and specificity of 100%.
- The LAMP-based kits have a positive predictive value of 100% and a negative predictive value is 98.8% with an accuracy of 99.3%.
- In India, Agappe Diagnostics developed the LAMP technology and their kit has been validated by the ICMR for marketing and named it LUME Screen nCoV.
- At present, a confirmatory, rapid, accurate, user-friendly, and low-cost molecular diagnostic method is a must to address the COVID-19 pandemic. The RT-LAMP is best for Indian conditions.

33. Luhri Stage-I Hydro Power Project:

- The Cabinet Committee on Economic Affairs chaired by Prime Minister Shri Narendra Modi has approved the investment of Rs.1810.56 crore for 210 MW Luhri Stage-I Hydro Electric Project.
- It is located on river Satluj which is situated in Shimla & Kullu districts of Himachal Pradesh.
- This project will generate 758.20 million units of electricity annually.
- This project is being implemented by Satluj Jal Vidyut Nigam Limited (SJVNL) on Build-Own-Operate-Maintain (BOOM) basis with active support from Government of India and State Government.

34. Viability Gap Funding (VGF):

- Viability Gap Funding (VGF) Means a grant one-time or deferred, provided to support infrastructure projects that are economically justified but fall short of financial viability.
- The lack of financial viability usually arises from long gestation periods and the inability to increase user charges to commercial levels.
- Infrastructure projects also involve externalities that are not adequately captured in direct financial returns to the project sponsor.
- Through the provision of a catalytic grant assistance of the capital costs, several projects may become bankable and help mobilise private investment in infrastructure.
- Government of India has notified a scheme for Viability Gap Funding to infrastructure projects that are to be undertaken through Public Private Partnerships.
- It will be a Plan Scheme to be administered by the Ministry of Finance with suitable budgetary provisions to be made in the Annual Plans on a year-to- year basis.

- The quantum of VGF provided under this scheme is in the form of a capital grant at the stage of project construction.
- The amount of VGF will be equivalent to the lowest bid for capital subsidy, but subject to a maximum of 20% of the total project cost. In case the sponsoring Ministry/State Government/statutory entity propose to provide any assistance over and above the said VGF, it will be restricted to a further 20% of the total project cost.
- Support under this scheme is available only for infrastructure projects where private sector sponsors are selected through a process of competitive bidding.

35. 15th G20 Summit:

- At the invitation of His Majesty King Salman bin Abdulaziz Al Saud, Custodian of the Two Holy Mosques, Kingdom of Saudi Arabia, Prime Minister Shri Narendra Modi attended the 15th G20 Summit chaired by the Kingdom of Saudi Arabia, under the theme "Realising the Opportunities of 21st Century for All" on 21-22 November 2020.
- Founded in 1999 with the aim to discuss policy pertaining to the promotion of international financial stability, the G20 has expanded its agenda since 2008 and heads of government or heads of state, as well as finance ministers, foreign ministers and think tanks, have periodically conferred at summits ever since.
- Membership of the G20 consists of 19 individual countries plus the European Union. The EU is represented by the European Commission and by the European Central Bank.
- In addition to these 20 members, the chief executive officers of several other international forums and institutions participate in meetings of the G20.
- These include the managing director and Chairman of the International Monetary Fund, the President of the World Bank, the International Monetary and Financial Committee and the Chairman of the Development Assistance Committee.
- Collectively, the G20 economies account for around 90% of the gross world product (GWP), 80% of world trade, two-thirds of the world population, and approximately half of the world land area.
- The G20's membership does not reflect exactly the 19 largest national economies of the world in any given year.
- A 2011 report released by the Asian Development Bank (ADB) predicted that large Asian economies such as China and India would play a more important role in global economic governance in the future.
- The report claimed that the rise of emerging market economies heralded a new world order, in which the G20 would become the global economic steering committee.

36. Unnat Bharat Abhiyan - 2.0:

- The central government of India has announced about the second phase of the Unnat Bharat Abhiyan initiatives.
- Unnat Bharat Abhiyan was launched for the first time in the year 2014. The Human Resource & Development Ministry of India has launched the initiative to enhance the lifestyle of the villages and the rural people.
- The main objective of the scheme is to provide better future to the community and people living in remote rural areas.
- The initiative was taken by the HRD Ministry in partnership with the Indian Institute of Technology (IIT). There are other engineering colleges such as NIT, NITTTRs, Pune Engineering College and some other government run colleges which are part of this initiative.
- First phase or edition of the Unnat Bharat Abhiyan was first started in the year 2014. In the first phase there were 132 villages were selected. Alongside there were 16 institutions were selected which had participated in the initiative.
- The HRD Ministry of India has announced about the second edition of the initiative on 25th April 2018. Union HRD Minister Mr. Prakash Javadekar has launched and announced the initiative's second phase in Delhi.

- The main implementation will be done through the IIT Delhi. Under their supervision other colleges will implement the initiative across the nation. This year 750 higher educational institutions have been selected to join the Abhiyan.
- On the launching ceremony, a seminar was conducted by the HRD ministry. They have announced that over 45, 000 villages will be covered under this Abhiyan for that the authority will need at least more than 8000 students.

37. Lachit Borphukan:

- The Prime Minister, Shri Narendra Modi has paid tribute to Lachit Borphukan on Lachit Diwas.
- Lachit Borphukan (1622 - 1672) was a commander in the Ahom kingdom, in present-day Assam, India, known for his leadership in the 1671 Battle of Saraighat that thwarted a drawn-out attempt by Mughal forces to take over Ahom kingdom.

38. Pinaka Missile System:

- The development of the Pinaka was started by the DRDO in the late 1980s, as an alternative to the multi-barrel rocket launching systems of Russian make, called like the 'Grad', which are still in use.
- After successful tests of Pinaka Mark-1 in the late 1990, it was first used in the battlefield during the Kargil War of 1999, quite successfully.
- The Pinaka, which is primarily a multi-barrel rocket system (MBRL) system, can fire a salvo of 12 rockets over a period of 44 seconds.
- One battery of Pinaka system consists of six launch vehicles, accompanied by the loader systems, radar and links with network based systems and a command post. One battery can neutralise an area one kilometre by one kilometre.
- As a key tactic of long range artillery battle, the launchers have to 'shoot and scoot' to ensure they themselves do not become the targets, especially due to its back blast. Thus the launcher vehicles are required to have a high degree of maneuverability.
- The Mark-I version of Pinaka has a range of around 40 kilometres and the Mark-II version can fire up to 75 kilometres.
- The Mark-II version of the rocket has been modified as a guided missile system by integrating it with the navigation, control and guidance system to improve the end accuracy and increase the range.
- The navigation system of the missile is linked with the Indian Regional Navigation Satellite System. In comparison to artillery guns, rockets are less accurate, but with addition of guidance and navigation systems, this aspect is taken care of.
- With its upgrades, the Pinaka Mark-II can be a key element in the "network centric warfare". The rocket system can operate various modes and can carry different types of warheads.

39. Right to Recall:

- Recently, the State Assembly of Haryana clears a Bill on right to recall panchayat member. That is the Haryana Panchayati Raj (Second Amendment) Bill, 2020.
- The purpose of the amendment is to increase their accountability to the voters.
- The Bill provides the right to recall members of Panchayati Raj institutions to those who elected them.
- It also gives women a 50% reservation in these rural bodies.
- The Bill provides reservation of 8% to the "more disadvantaged" among the Backward Classes.
- It also allows recalling village sarpanches and members of the block-level Panchayat Samitis and district-level Zila Parishad if they fail to perform.
- The procedure to recall a sarpanch and members of the two bodies: 50% members of a ward or gram Sabha have to give in writing that they want to initiate proceedings.
- It's followed by a secret ballot, during which their recall would require two-third members voting against them.

40. National Legal Services Day:

- The National Legal Services Day is celebrated on 9th November to spread awareness for ensuring reasonable fair and justice procedure for all citizens.
- National Legal Services Day (NLSD) was first started by Supreme Court of India in 1995 to provide help and support to poor and weaker sections of the society.
- Free legal services are provided in matters before Civil, Criminal and Revenue Courts, Tribunals or any other authority exercising judicial or quasi-judicial functions.

Objectives of Legal Services Authorities are:

- Provide free legal aid and advice
- Spread legal awareness
- Organise lok adalats
- Promote settlements of disputes through Alternative Dispute Resolution (ADR) Mechanisms. Various kinds of ADR mechanisms are Arbitration, Conciliation, Judicial settlement including settlement through Lok Adalat, or Mediation
- Provide compensation to victims of crime

Persons Eligible for Free Legal Services:

- Women and Children
- Persons with disability
- Member of Scheduled Caste or Scheduled Tribes
- Industrial Workmen
- Persons in custody
- Victims of natural disasters, ethnic/caste violence, industrial disaster
- Victims of Human Trafficking or Begar
- Persons with an annual income of less than Rs. 1,00,000/- or as notified by the Central/State Governments.

Legal Services Institutions for providing Free Legal Services:

- **National Level:** National Legal Services Authority
- **State Level:** State Legal Services Authority. It is headed by the Chief Justice of the State High Court who is its Patron-in-Chief. A serving or retired Judge of the High Court is nominated as its Executive Chairman.
- **District Level:** District Legal Services Authority. The District Judge of the District is its ex-officio Chairman.
- **Taluka/ Sub-Division Level:** Taluka/ Sub-Divisional Legal Services Committee. It is headed by a senior Civil Judge.
- **High Court:** High Court Legal Services Committee
- **Supreme Court:** Supreme Court Legal Services Committee
- In carrying out all these responsibilities, NALSA works in close coordination with the various State Legal Services Authorities, District Legal Services Authorities and other agencies for a regular exchange of relevant information, monitoring and updating on the implementation and progress of the various schemes in vogue and fostering a strategic and coordinated approach to ensure smooth and streamlined functioning of the various agencies and stakeholders

National Legal Services Authority:

- The National Legal Services Authority (NALSA) was constituted under the Legal Services Authorities Act, 1987 which came into force on 9th November, 1995 to establish a nationwide uniform network for providing free and competent legal services to the weaker sections of the society.
- The Chief Justice of India is the Patron-in-Chief and the second senior most Judge of Supreme Court of India is the Executive Chairman of the Authority.
- Article 39 A of the Constitution provides for free legal aid to the poor and weaker sections of the society, to promote justice on the basis of equal opportunity. Article 14 and Article 22 (1), obligates State to ensure equality before law.
- It can be noted that the role played by NALSA and its networks is very much relevant to achieving the Sustainable Development Goal-16 , which seeks to "Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels"

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