



SHAPING TALENT

CURRENT AFFAIRS DECEMBER 2020

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Page | 3 1. World's First Legal Case on Death Caused by Air Pollution:

- In a first of its kind legal case anywhere in the world, the UK is examining the death of a nine-year-old girl that may be due to air pollution.
- Ella Adoo Kissi-Debrah, a nine-year-old from the UK died in the year 2013. She lived with her mother near a busy road in London.
- An inquest into the death of the girl possibly due to air pollution is being carried out in London.
- The case could possibly become the world's first case to legally certify air pollution as the cause of death.

The Illness:

- Ella Adoo Kissi-Debrah suffered seizures due to breathing problems and had visited the hospital 27 times for three years before her death.
- She lived close to South Circular, a busy and congested road in Southern London.
- In 2014, an inquest into her medical care found that Ella died of acute respiratory failure due to an asthma attack.
- In 2019, the family was able to get an inquest order from the High Court in light of the new evidence regarding air pollution.

The Second Inquest:

- The second inquest will look into the facts whether air pollution is the cause of the death or not and how pollution levels were monitored during the time of Ella's death.
- Also, issues such as the measures taken to reduce air pollution, and information provided to the public regarding the pollution levels, problems associated with it, and ways to reduce pollution exposure will be taken up during the inquest.

Failure of the Authorities:

- A report by an acclaimed expert revealed that the air pollution levels near the house of Ella were significantly higher than the EU limits of that time.
- The inquest will look into the failures of the authorities in reducing the pollution levels, and failure at providing information to the public regarding air pollution risks and how much they contributed to Ella's death.

Significance of the Case:

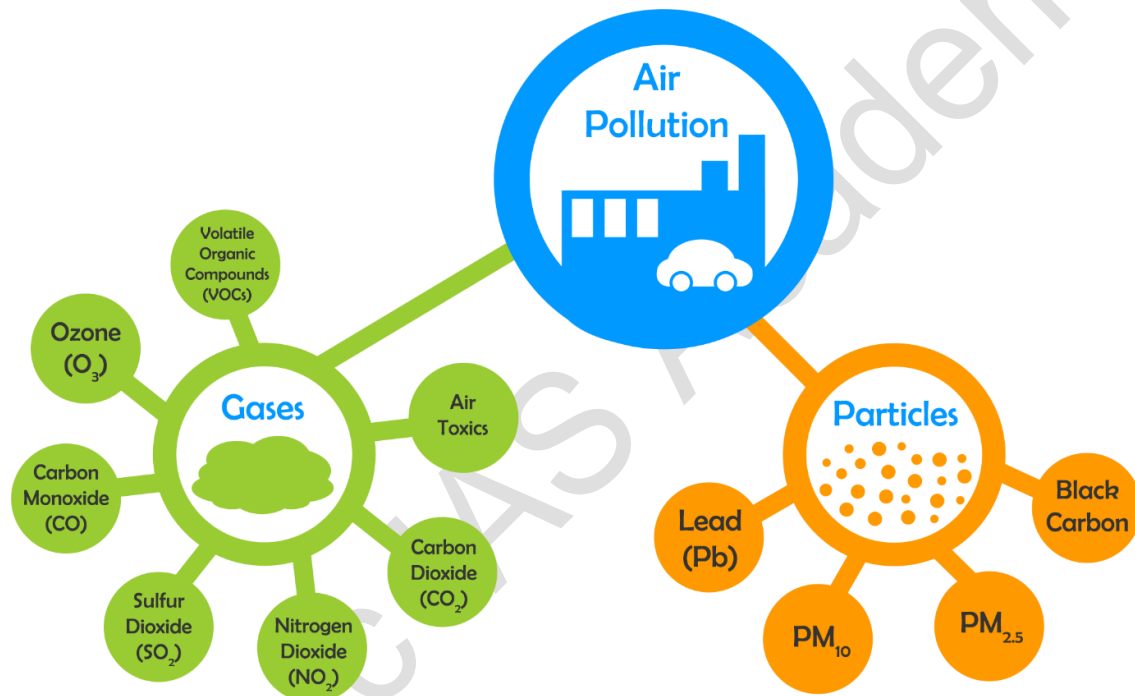
- If the campaign of Ella's family succeeds, Ella's mother Rosamund will become the first person in the UK and anywhere in the world to record air pollution as the cause of death.
- Also, the case will bring the angle of denying Ella the 'Right to Life' under Article 2 of the European Convention on Human Rights by the authorities.
- The case is significant because, apart from setting a precedent, it will save millions of lives of children around the world and especially in India.
- It will put an obligation on the governments to protect the right to life which includes the right to breathe clean air.
- Worldwide, toxic air causes 7 million premature deaths and kills 500,000 children under five years of age.

- The implications will be severe for India as the pollution levels in India are far higher than in the UK.

The Silent Killer:

- Air pollution is a silent killer.
- According to the World Health Organisation (WHO), 4.2 million deaths worldwide are due to ambient air pollution and 3.8 million deaths are due to exposure to dirty cooking stoves and fuels in households.
- World over, 90% of the people live in places where air pollution is worse than the WHO recommended levels.
- The legal challenge on Ella's death will set a legal precedent in the world and strengthen the human cause of the right to breathe clean air.

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2. Body Created to Oversee Paris Climate Goals:

- The Ministry of Environment, Forests, and Climate Change has formed the Apex Committee for Implementation of the Paris Agreement (AIPA) to oversee India's Paris Climate Agreement goals.
 - AIPA will be chaired by the Secretary Ministry of Environment.
 - The objective of the AIPA is to ensure that India is on track in fulfilling its objectives under the Paris Climate Agreement and the Nationally Determined Contributions (NDC).
 - NDC
 - During the 2015 Paris Agreement, India submitted its NDCs, to be implemented post-2020.
 - India submitted eight goals that include three quantitative goals.
 - **The three quantitative goals are:**
1. By 2030, the emissions intensity of GDP will be reduced by 33 to 35% from 2005 levels.

2. By 2030, 40% of the cumulative installed power will be from non-fossil fuel-based energy sources.
3. By 2030, an additional carbon sink of 2.9-3 billion tonnes of carbon dioxide equivalent in the form of additional forests and tree cover will be created.
4. The other goals are:
5. To promote healthy and sustainable living that is based on traditions and values of conservation and moderation.
6. To follow climate-friendly economic development.
7. Adapting to climate change by investing and developing vulnerable sectors and regions.
8. Mobilizing funds both domestically and from developed countries for climate change mitigation and adaptation actions.
9. To build capacity and fast diffusion of cutting edge climate technology into India and promote joint collaborative R&D efforts for future climate technologies.

The Members:

- Senior officials of 14 ministries will be part of AIPA and oversee the implementation of NDCs.
- The AIPA receives periodic information updates.
- The information helps AIPA to monitor, review, and revisit climate goals so that the Paris Climate Agreement is fulfilled.
- Under Article 6 of the Paris Climate Agreement, AIPA will also function as a National Authority to regulate carbon markets in India.
- It will formulate guidelines for considering projects or activities, issues guidelines on carbon pricing, market mechanism, and other instruments that will have an effect on climate change and NDCs.
- The authority will take note of the contributions of the private sector and multi-/bi lateral agencies on climate change and guide them to align their climate action with national goals.

3. Malayan Giant Squirrel Disappearing:

- The first-ever study on the Malayan Giant Squirrel, one of the largest squirrels in the world, found that it is disappearing in the wild at a fast pace.
- The Malayan Giant Squirrel (*Ratufa bicolor*) is found in parts of West Bengal, Sikkim, Assam, Nagaland, Meghalaya, and Arunachal Pradesh.
- It has a dark upper body, pale underparts, and a bushy tail.
- The squirrel is a “forest health indicator species”.
- As per the study conducted by the Zoological Survey of India (ZSI), it is fast disappearing from the forests of the Northeast where it is native.
- It is estimated that by the middle of this century, the squirrel may become extinct in the wild.
- As per ZSI, by 2050, the squirrel population could reduce by 90% in India and in the subsequent decades will become extinct.
- The major threat to the survival of the giant squirrel is the destruction of its habitat.
- As per estimates, by 2050, the squirrel will be restricted to the forests of southern Sikkim and North Bengal.

- The study found that currently, only 43.38% of the original habitat of the Malayan Giant Squirrel is favorable to it, which will shrink to 2.94% by 2050.
- This is the first-ever study on Indian giant squirrels which made the researchers realize that the Malayan Giant Squirrel is losing its territory to human settlements and cultivation.



Critical To Forests:

- India has three giant squirrels - the Indian Giant Squirrel, the Grizzled Giant Squirrel, and the Malayan Giant Squirrel.
- According to researchers of the study, if conservation efforts are not taken immediately, we may lose the Malayan Giant Squirrel altogether.
- Giant squirrels are diurnal, arboreal (tree-dwelling), and herbivorous.
- The health of the species indicates the health of the forests.
- They are known as indicator species because they determine the health of the vegetation in the forest, the plant species that they feed on, and the symbiotic species that depend on these plants.
- The Malayan Giant Squirrel is also found in Southern China, Thailand, Vietnam, Laos, Burma, Malayan peninsula, Sumatra, and Java.
- The species is found in plains and hills with an altitude difference of 50m and 1500m.
- They inhabit evergreen and semi-evergreen forests.
- About 20% of the Malayan Squirrel population in India is found between altitudes 1500m and 2700m above sea level. The rest are found in the plains and upto 1500m.
- India constitutes 8.5% of the Squirrels range in Asia.
- The IUCN's Red List of 2016 had placed the species in the Near Threatened category, as such the species is protected under the Wildlife Protection Act of India.
- In the last two decades, the population of the species had declined by 30% in India.
- From 1987 to 2013, the Northeast region has gained 7,172 sq. Km of forests, but in the last two years, it has lost 628 Sq. Km of forests.

Major Threats:

- Researchers identified the following as the major threats to the species:
- Slash and Burn Cultivation (Jhum cultivation)
- Deforestation

- Forest Fragmentation
- Food Overharvesting
- Crop Cultivation
- Illegal Wildlife Trade
- Hunting for consumption

4. UN Reclassifies Cannabis:

- The United Nations has reclassified cannabis as not a dangerous narcotics.
- In the 63rd session of the UN Commission on Narcotic Drugs (CND), the majority of the members voted to remove cannabis and cannabis resin from the list of dangerous narcotics in the flagship international convention on narcotic drugs.
- India too voted in favor of removing the substance from the list.
- The vote will remove Cannabis from **Schedule IV of the 1961 Single Convention on Narcotic Drugs**.
- The vote will bring changes in the way cannabis is used and internationally regulated.
- It is now put in Schedule 1 of the convention which has the least dangerous substances.
- Till now, cannabis has been subjected to restricted use which even discouraged its use for medicinal purposes.

CND:

- The United Nations Commission on Narcotic Drugs (CND) works under the United Nations Economic and Social Council (ECOSOC).
- CND is the UN's central body to frame policies on drugs and plays important roles under international drug conventions.
- It has 53 member countries which include India, the USA, and important European Union countries.
- Of the 53 members, 27 voted in favor to delete cannabis and cannabis resin from Schedule IV of the 1961 convention, while 25 including China, Pakistan, and Russia voted against it. Ukraine abstained from voting.

The Benefits:

- Cannabis, the most commonly used recreational drug has been illegal so far.
- With the vote, the potential of the drug to be used for medical and therapeutic purposes will open up.

Indian Regulation:

- India regulates cannabis under the Narcotic Drugs and Psychotropic Substances (NDPS) Act, 1985.
- Under the act, it is a punishable offense to produce, manufacture, possess, sell, purchase, transport, and use cannabis.
- The act also covers chars, the cannabis resin.
- Recently, the Narcotics Control Bureau (NCB) had carried out high-profile arrests regarding possession of cannabis which took the country by storm.

Will It Bring Worldwide Change?

- Originally, the vote was scheduled to take place in 2019, where the World Health Organisation (WHO) has recommended removing cannabis and cannabis resins from six conventions including the 1961 Single Convention on Narcotic Drugs.
- But, CND postponed it by a year and had now taken up the vote.

- The vote will not bring immediate changes to the way cannabis is regulated internationally.
- Till individual countries take steps to remove the recreational drug from their regulatory rules, global acceptance of cannabis as a less dangerous drug will take time.
- Yet, the vote will set in motion the process of deregulating cannabis as many countries intend to do so.

Changing Attitudes:

- Globally, there is a change in attitude towards cannabis usage.
- Over 50 countries now allow cannabis for recreational or medical purposes.
- Countries like Canada, Uruguay, and 15 states in the United States have legalized cannabis.
- With India voting in favor of removing cannabis from the dangerous list, its usage for medical purposes may increase in the country. But, we should wait and see whether the government will allow the mass usage of cannabis for recreational purposes.

5. Singapore Approves Lab-Grown Meat for Commercial Sale:

- The Singapore Food Agency (SFA) has approved the sale of lab-grown meat becoming the first country in the world to clear the sale of lab-grown meat.
- The SFA approved the sale of cultured chicken produced by the US-based company Eat Just.
- The company will collaborate with local partners to market its brand GOOD Meat.

Significance of the Approval:

- The UN Food and Agriculture Organisation (FAO), in its June 2020 Food Outlook Report noted that the global meat production will be at 333 million tonnes which is 1.7% lower than that of 2019.
- The disruption is majorly due to the Covid-19 pandemic, but also zoonotic infections like the African Swine virus and highly-infective avian influenza are other reasons for the shortfall.
- For the alternative meat industry, this is an opportunity.
- According to Nielsen REport from May 2020, there is a 264% rise in the sale of plant-based meat in the US. Plant-based meat is available in all retail outlets since 2018 in the US.
- Another report from Barclays in 2019 predicted that of the \$1.4 trillion global meat industry, the alternate meat industry could capture 10% over the next decade.
- While plant-based meat is finding favour, lab-grown meat is at the nascent stage and the approval for commercial sale by SFA thus assumes significance.

Difference Between Lab-Grown Meat and Plant-Based Meat:

- Plant-based meats are produced from soy or pea protein, whereas cultured meat is grown from cells in a laboratory.
- Both have the same objective of providing protein to the consumer, offering an alternative to traditional meat sources where the threat of zoonotic is high and also helps mitigate the environmental impact of meat consumption.
- The cellular structure of cultured meat is similar to animal meat with the difference being it not coming directly from animals.

The Benefits:

- According to the Global Food Institute's (GFI) 2019 State of the Industry Report, lab meat has the following benefits:
- Cultivated beef can reduce land use by 95% compared to conventional beef
- It can reduce climate change emissions in the production by 75-87% compared to conventional beef production
- It can reduce nutrient pollution by 94%
- As the meat is created in clean facilities, it significantly reduces contamination by pathogens like E. Coli and Salmonella
- It does not require antibiotics to grow and significantly reduces the public health issues of antibiotic resistance

Other Companies Making Cultured Meat:

- According to GFI, world over, 55 companies are making cultivated meat products.
- India's Delhi-based Clear Meat is one among the 55.
- The company is making cultured chicken.

Availability to the Consumers:

- The wide availability of cultured meat has a long way to go.
- First, it must overcome the high cost barrier. Makers of cultured meat must figure out a way to make it affordable to consumers.
- Additionally, there is distrust among consumers on cultured meat and resistance from traditional meat producers.
- The traditional meat producers have a strong lobby and will fight for their market. Already, they have questioned the notion of alternative meat and have filed a suit in the EU (which failed) and in the US (where the lobby has some success).
- Scaling up is another impediment for the alternative meat industry.

6. IISc Develops a New Device To Measure Evaporation Rate:

- A team from the Indian Institute of Science (IISc) Bangalore has developed an inexpensive and efficient device to measure evaporation rate.
- The new device developed by IISc will be an alternative to the current methods and will measure the evaporation rate within a few minutes.
- Evaporation has a critical process of regulating water loss in plants through the process of transpiration.
- Measuring the evaporation rate accurately benefits the farmers to gauge the water requirements for their fields and weather stations to define atmospheric conditions.
- Botanists use evaporation rates to understand the transpiration dynamics of plants
- Currently, pan evaporimeter are widely used.
- They resemble a large pan with water filled in it.
- The change in water levels in the pan over a day gives the evaporation rate of the area.
- One has to wait for a whole day to measure the rate and also, the device requires a large area - one square meter.
- The device developed by IISc measures evaporation rate directly from a small surface - a few centimeters to be exact.
- As the results will be available within a few minutes, IISc's device gives a realistic measure of transpiration in plants and evaporation from the soil.

Working of the Device:

- The device consists of a small capillary tube that is attached to a filter paper.
- The water collected into the capillary from the water reservoir moves to the filter paper, wetting it thereby mimicking evaporation.
- The evaporation rate is calculated based on the distance travelled by the lower meniscus in the capillary tube over a couple of minutes.
- The innovation in the device is its ability to measure very small rates of evaporation about 1 microlitre per minute.
- The utility of the device is its ability to measure the evaporation rate in a niche environment where evaporation is dependent on temperature, humidity, and wind velocity.
- Biologists would benefit immensely from the device as they can measure evaporation over a small area of the plant and get results quickly.

7. Giant African Snails Invasion:

- A new study finds the repeated invasion of Giant African Snails in India.
- A recent study has found that the Giant African Snails have repeated invasions in Kerala, India.
- The **Giant African Snails**, known as *Achatina Fulica* are found in Asia and Africa.
- These are dangerous pest species and the new populations continue to arrive in India from the snail-infested countries across the world.
- The snail's population found in India had a higher genetic variation than those found in Africa.
- The higher genetic diversity of the species indicates that the snail continues to have multiple invasions from different countries.
- Researchers from the Environmental Agency, UAE, Nottingham University, and Natural History Museum, London conducted the study on the invasion of the species.
- Researchers found the same genetic strains of the snail population in India and the UAE.
- The snail's population in India and UAE share the same haplotypes, a set of genes within an organism inherited together from a single parent.
- The cause of snail introduction is by considering material movement between the two countries.
- The study was conducted at the Kerala Forest Research Institute (KFRI). This research was supported by the Kerala State Council for Science, Technology, and Environment (KSCSTE) between 2016 and 2020.
- In the early 1950s, a researcher from Annamalai University, Tamil Nadu accidentally released them at Elapully in Palakkad.
- The snail population spread rapidly in Kerala with two more waves of invasion in the 1970s and 2005.
- The cause of their spread in Kerala is the import of timber.
- In 2005, the snails were recorded only in Palakkad, Ernakulam, and Pathanamthitta. But now in 2020, it has spread to all districts except Idukki.
- The International Union for Conservation of Nature (IUCN) declared it as one of the worst species.
- **Giant African Snail is suspected to spread eosinophilic meningitis, peritonitis, and septicemia in humans.**

- **In Ernakulam and Thiruvananthapuram, cases of eosinophilic meningitis were reported among children.**
- Because of its repeated invasions, snail control is very difficult.
- There is a need for a long-term strategy to control and eradicate this invasive species.

8. Low Groundwaters Regions Grow More Cereals in India:

- States with low groundwater reserves are producing 41% or 38.6 million tonnes of domestic cereals.
- Only 39% of the groundwater is being used in producing and trading cereals.
- Domestically produced cereals of about 21% (19.6 million tonnes) were exported from six states.
- These States are with semi-critical or critical groundwater status equivalent to 32% of groundwater
- This analysis was done by scientists spanning multiple institutions in India and abroad.
- An average Indian gets half of the energy from cereals from the diet.
- Rice and wheat dominate cereal production and these crops are intensely water consumption crops.
- The researchers used mathematical modeling techniques and used data sets from 2011-12.
- The data had information on inter-state trade of cereals, domestic cereal production, transportation cost by rail and road between states.
- With the help of this data the water footprint of producing and transporting cereals was estimated.
- The previous studies of embedded water flow in agriculture production were usually focused on international movements. But this study focused on domestic movements and incorporates the role of the public distribution system as well as international outflows.
- The patterns of trade varied between the public distribution systems and non-PDS cereals.
- The majority of 58% of inter-state cereal trade occurred through PDS.
- The new research findings show the substantial potential for balancing water resources through the trade of crops either in addition to or in place of large-scale infrastructure projects.
- The Ashoka Trust for Research in Ecology and the Environment- Bengaluru, University College London, the London School of Hygiene and Tropical Medicine, and the Brandenburg University of Technology, Germany conducted the study.

Alternate Crops:

- For some time now, the government is trying to push farmers from regions with water scarcity to try alternate crops that require less water than cereals. But, the results were far from satisfactory.
- The problem lies in the incentives given to farmers cultivating cereals. Starting with the Green Revolution various incentives like the Minimum Support Price (MSP) for major cereals, subsidised electricity, and fertilizers led to a cropping pattern where water-guzzling crops are being grown in abundance. This has led to the depletion of the water table as cereals cultivation is majorly through groundwater. Now, in states like Punjab, Haryana, UP, and Andhra Pradesh, the groundwater levels are depleting at a rapid pace.

- If the current cropping patterns continue there will be repercussions in the form of non-availability of water for drinking and India's food security will be threatened. Thus, the government must take urgent steps to reduce groundwater depletion and provide incentives for farmers to grow alternate crops.

9. The Sliding Australia-China Ties:

- The bilateral relations between Australia and China have been hit and are sliding.
- The Australia-China bilateral relations have slumped to a new low which were already dwindling for over a few months now.
- The latest low came when a Chinese Foreign Ministry official tweeted an image that depicted Australia in a poor light over its Army's war crimes in Australia.
- For Australia, the emergence of China as its biggest trading partner has provided a delicate balancing act between trade and security.
- The trade dependence of Australia on China has grown rapidly such as 39% of exports such as iron ore and 27% imports in 2019-20.
- Cracks in the relations began when Australia blacklisted Huawei and ZTE in 2018 from being involved in the rollout of its 5G networks.
- In the same year, Australia brought a new foreign interference law that was aimed at China.
- The rift widened this year when Australia, in April, called for an independent inquiry about the origins of the Covid-19 pandemic and criticized China and WHO for the initial handling of the outbreak.
- In retaliation, China banned meat imports from four Australian plants and imposed an 80.5% tariff on barley.
- Australia initiated its own anti-dumping investigation into Chinese steel.
- It also prevented Chinese company Mengniu Dairy from acquiring Australia-based Lion Dairy and Drinks which owns the country's well-known brands.
- China banned Australian coal imports where the ships carrying a million tonnes of coal stopped at the Chinese ports for months for clearance.
- In November, China imposed tariffs of 107.1% to 212.1% on Australian wine labels.
- Amidst the tensions, China and Australia signed the landmark Regional Comprehensive Economic Partnership (RCEP) agreement in November.
- But the relations took an ugly turn when Australia, New Zealand, Canada, the UK, and the US announced the 'Five Eyes' intelligence alliance on developments in Hong Kong.
- Public sentiment in Australia is also against China which means things are on the brink between the two countries.

Analysis:

- The Wolf Warrior diplomacy of China is causing tensions with all the major powers of the world. The Chinese diplomats are projecting China's invincibility through their tone and language. When Mr. Zhao Lijian, a foreign Ministry official of China, while commenting on the 'Five Eyes' alliance said that the adversaries must be ready to get their eyes poked by China shows that they have the full backing of the Chinese administration in instigating tensions.
- From the Ladakh standoff to the spat with Australia, it seems China is trying to project itself as an alternate superpower to the world.

10. An Analysis on India's Economic Recovery:

Nature and Shape of India's ongoing Economic Recovery:

- There are many ways to measure economic recovery.
- The first method is to look at the summary measures of national economic performance.
- This includes government revenues, industrial production, and GDP.
- Tax and non-tax government revenues have grown and industrial output has also been steadily rising but this slowed down in October for a few sectors.
- The growth was reflected in the GDP numbers of the second quarter, yet it was still lower than their corresponding levels from the previous year.
- The other method is to start from the bottom by studying household surveys.
- This allows the researchers to study the economy at the level of individual households.
- The Consumer Pyramids Households Survey (CPHS) by CMIE surveyed over 174,000 households across a range of indicators.
- The key factor of household economic well-being from CPHS is unemployment, which showed a remarkable recovery in the second quarter.
- The other key factors that were considered are the labor market health, employment-to-population ratio, per capita income, and expenditure.
- There is evidence of recovery which is not strong and is not distributed evenly across the states.

Unemployment Rate:

- Immediately after the COVID-19 lockdown, there was a shot up in the unemployment rate.
- It was just one of the measures of labor market stress.
- But after a sharp spike, the rate of unemployment dropped to pre-pandemic levels.
- This is due to those who reported as unemployed found a job quickly or left the labor force entirely.
- So, there was a drop in the employment-to-population ratio or Epop.
- This is the employment rate or the Worker Population Ratio (WPR) where it measures the number of people employed as a fraction of the total working-age population.
- This shows an overall reduction in employment.
- When the unemployment rate bounded back, the Epop has not fully recovered.
- This shows that India has 20 million fewer employed people before Covid.
- A constructive measure of Epop suggests that there might be 40 million fewer employed people than before the pandemic.
- There could be a surge in the unemployment rate in months if people start looking for jobs.

Worst Hit Income Groups:

- In June and July, the household incomes remained depressed.
- In April, the household per-capita income reached the lowest which was 44% lower than the previous year.
- In June they rose to 25% lower but the pace of recovery reduced dramatically in July, 22.5% lower compared to July 2019.
- The loss in income is because the occupations were less remunerative during the lockdown.

- These losses were among subsistence farmers, smaller businessmen, agricultural laborers, machines, and industrial workers.
- Among all the income groups the middle-class groups suffered the worst.
- The lowest income of 20% bounced back fast but the highest 10% of income earners have taken the longest to recover.

Government's Help:

- In total, the direct benefit transfers played little role in stabilizing falling incomes.
- The expansion of PDS and free food played a major role.

Changes in Income:

- After partial recovery, monthly per capita non-food household expenditure was Rs 2000 and food expenditure was Rs1500.
- Due to lockdown, both food and non-food expenditure fell sharply.
- From April, non-food expenditure has struggled to recover and remained 35% below the pre-pandemic levels.
- Food expenditure picked up but was 12% lower in July than in July 2019.
- The per-capita food expenditure was constant and expenditure on protein-rich foods remained 10% lower in July than pre-Covid levels

11. Japan's Space Mission:

- Japan's Hayabusa2 spacecraft successfully landed in the Australian Outback.
- Hayabusa2 spacecraft is a small capsule that successfully landed in the populated desert Woomera in the Australian Outback.
- It is a 16 kg container beacon and was tracked by the Royal Australian Air Force.
- For research, it will be flown back to Japan after the preliminary research.
- The Japan Scientists called the capsule a treasure box.
- Japan launched the Hayabusa mission in 2003 and Hayabusa2 is its successor.
- It sent the samples from another asteroid in 2010, Itokawa.
- This spacecraft was burnt but the capsule made to the Earth.

The Hayabusa2 Mission:

- The Hayabusa2 spacecraft was launched on December 3, 2014, and is a successor to the Hayabusa mission.
- It is an unmanned spacecraft that touched twice the asteroid Ryugu which is more than 300 million kilometers away from Earth.
- The mission's team revised landing plans as the asteroid's surface was extremely rocky.
- The spacecraft arrived at Ryugu in June 2018 and had collected valuable data.
- Further, it collected soil and rock samples.
- It touched the surface area in February 2019 and collected the surface dust samples.
- Hayabusa2 blasted a crater into the asteroid's surface and collected the underground samples.
- Japan may use the Hayabusa2 expertise and technology in its 2024 MMX sample return mission to a Martian moon.

Why an Asteroid?

- Asteroids are smaller than planets and orbits around the Sun.
- They may contain clues into how the Earth evolved as they are the oldest objects in the solar system.

- Ryugu in Japanese means ‘Dragon Palace’, in a Japanese folk tale it is the name of a sea-bottom castle.
- The research of asteroids may lead to resource development and finding ways to protect Earth from collisions with big meteorites.

The Capsule:

- Hayabusa2 is a pan shaped capsule and is 40 cm in diameter.
- It contains soil samples taken from two different sites on the asteroid.
- The preliminary inspection at a lab in Australia was to extract gas and analyze it as some gases might be embedded in the rocks.
- Hayabusa2 was sent to another mission to the smaller asteroid, 1998KY26 after separating the capsule at 220,000 kilometers from the Earth.

Study of Asteroids Samples:

- The samples taken from under the asteroid’s surface area contain data from 46 billion years ago which are not affected by space radiation and other environmental factors.
- The samples can be used to study organic materials in the samples to learn about how they are distributed and how they are related to the evolution of Earth.
- The fragments brought from Ryugu can tell its collision and thermal history.
- JAXA will share some samples with NASA and the rest 40% will be stored for future research. For planned research, 0.1 gram of the sample is enough.

12. Chang’e 5 Returns with Moon Samples:

- Chang’e 5, the Chinese unmanned moon probe delivers samples from the moon.
- Chang’e 5 is part of the Chinese Lunar Exploration Mission.
- It was launched on 23 November and landed on the Moon on 1st December 2020.
- After collecting the samples from the moon, the Chinese probe has successfully docked with the spacecraft orbiting the moon.

Significance of the Mission:

- Chang’e 5 carried the samples from the lunar surface and is the first for China.
- The Chang’e 5 mission is named after a mythical Chinese Moon goddess.
- The cargo capsule lifted off lunar rocks and soil on the surface and docked with the orbiter.
- This is the first time China has taken up docking of a probe with the orbiter in the lunar orbit.
- The cargo capsule is the first liftoff of a Chinese craft from the extraterrestrial body.
- The capsule will separate and return to the Earth after transferring the moon samples to the orbiter.
- China is moving fast to catch up with the US and Russia and has poured billions of dollars into its military-run space program.
- The samples from Chang’e 5 will help to learn more about the Moon’s origins and volcanic activity on its surface.
- If the mission is successful, China will become the third country to have retrieved samples from the Moon.

The Mission:

- The Chang’e 5 probe consists of an orbiter, lander, ascender, and a returner.
- The lander collected 2Kg lunar samples from Mons Rumker in Oceanus Procellarum which is situated on the near side of the moon.

- The samples collected are 1.2 billion years old. On December 3 the ascender took off from the moon and docked with the orbiter.

13. Eco Bridges in Forests - Saving Wildlife:

- **Eco-ducts or Eco bridges** to enhance wildlife connectivity built-in Uttarakhand are giving good results.
- Building eco-ducts and bridges in the forest enhance wildlife connectivity.
- Recently, the **first eco bridge for reptiles and smaller mammals was built across Ramnagar Forest Division in Nainital district, Uttarakhand.**

Importance of Eco-bridges:

- Highways and roadways that pass across the forests disrupt wildlife connectivity.
- Eco-ducts or eco bridges provide wildlife connectivity offering a safe passage to wild animals.
- There are different types of bridges which include canopy bridges for monkeys, squirrels, and other arboreal species, concrete overpass or underpass tunnels or viaducts for larger animals, and amphibian tunnels or culverts.
- These Bridges are laid with planting from the area to give it a contiguous look with the landscape.
- The Wildlife Institute of India (WII) conducted a study where it identified 50,000km of road projects for construction in India for the next five to six years and many highways to upgrade into four lanes.
- Three major sites were identified by the National Tiger Conservation Authority of New Delhi which was cutting across animal corridors.
- This includes National Highway 37 through the Kaziranga-Karbi Anglong landscape in Assam and State Highway 33 through the Nagarhole Tiger Reserve in Karnataka.
- On the Kaladhungi-Nainital Highway, a 90-foot eco-bridge was constructed in the Ramnagar Forest Division.
- This route is especially for reptiles such as monitor lizards.
- It also acts as an awareness-building mechanism for congested tourist routes.
- The bridge acts as a way to preserve the ecosystems necessary for the reptiles that feed on insects, snakes or reptiles, and eagles that feed on snakes.

Building Aspects:

- Size and location are the two important aspects of building eco-bridges.
- The other factors to consider for building a bridge are the animal habitats in the area, topography, road length, disturbance type, and its curvature.
- The animal movement pattern depends on the span and distribution of eco-bridges.
- The bigger bridges can be used by sambar, spotted deer, wild pig, and nilgai.
- For tigers and leopards, the bridges should be 5m or 500m.
- Animals like barking deer prefer closed habitats, so they need small bridges.

Challenges:

- **Scientists from the Nature Conservation Foundation in Tamil Nadu's Anamalai Hills built canopy bridges for lion-tailed macaques and Nilgiri langurs.**
- The scientists built six bridges in 2008 across a 3km stretch where these arboreal animals could move freely without being run over.
- The longest was about 25m and the smallest was about 10m.

- Scientists observed Kanha-Pench and Pench-Navegaon-Nagzira corridors on NH 44.
- They created five underpasses and four minor bridges on the 6.6km road within the forest.
- The team captures 18 species that use these underpasses which include leopard, tiger, and golden jackal.
- Scientists constructed a 750m long bridge in this area and are the world's largest underpass.
- The sloth bear took two years to cross the 750m bridge and the wolf and the pangolin took less than a year.
- The spotted deer and jungle cat took just a month to cross the bridge.
- Along with the Madhya Pradesh-Maharashtra border, the largest underpasses of 1.4km are being built for animal conservation.
- The other project proposal is the Chennai-Bangalore National Highway in the Hosur-Krishnagiri segment near the reserve forests for elephant crossings and the Tadoba-Andhari Tiger Reserve in Chandrapur, Maharashtra.
- Across the world, the eco-bridges concept is bringing good results. Wild animals are being saved from roadkills. Animals can roam freely in search of food and mates without getting disturbed by vehicles. More such bridges must come up in Indian forests.

14. Influence of Monsoons on Ladakh Studied:

- Researchers from India and China studied the influence of monsoon on the Ladakh-Karakoram region.
- The Ladakh-Karakoram region has seen an increase in recurrent flash floods.
- This is triggered by the growing influence of the Indian Summer Monsoon over the area.
- Researchers reconstructed climate variability and observed over the region during the last 4000 years.
- Researchers identified five major climatic shifts that have influenced the flora and fauna of the Himalayan region.
- Monsoon became an additional source causing precipitation in the trans-Himalayan region.
- This study was led by scientists from the Agharkar Research Institute (ARI) of Pune and the Institute of Tibetan Plateau Research, Beijing.
- The researchers suggest that the influence of monsoon has been designated around 2,640 years Before Present (BP).
- The occurrence of snow or rainfall originates in the Mediterranean Sea when the western disturbances have eastward-moving winds that will trigger the precipitation.
- The study reveals that the region is undergoing rapid transformation due to the impact of the monsoon.
- The research team discovered paleontological samples in the form of charcoal traces which confirmed that the Ladakh-Karakoram belt was used by the traders between present-day Europe and Asia.
- Scientists observed occurrences of high-frequency climate variability after 2,640 BP.
- This occurrence could have led to landslides, debris flow, avalanches disasters, and cutting off the vibrant trade route.
- Scientists discovered a **cold condition loving microbe called diatom *Didymosphenia* in Ladakh around 3000 years BP.**

- The research work included the study of chemical, physical, and biological proxies collected from glacial lakes approximately 4,100 years and have dip pits of 168cm dug at various locations.

How Is Study Useful?

- Insights on the past climatic effects on the Ladakh region will prepare India for future climatic events. With climate models predicting high-intensity Indian monsoons due to climate change, the study will act as a reference on what could be the possible impacts on the region.
- Based on the data authorities can develop better infrastructure for the people of Ladakh. Also, the research will be useful for India's military planners to safeguard the military assets against the vagaries of climate and prepares the personnel for dramatic climatic changes in the region.

15. Compulsory Organic Farming in Lakshadweep:

- Lakshadweep declared as an organic agriculture area.
- The entire Lakshadweep islands have been declared as an organic agriculture area.
- The Lakshadweep administration is eyeing an expansion of the traditional coconut and coconut products business.
- The expansion is through value addition, better marketing, and round the year processing.
- The island produces 10 crore coconuts in 12,000 smallholdings with an average size of 0.25 hectares.
- The total agricultural area under coconut is around 2,800 hectares.
- Declaring the island as an organic area gives a boost to the business and tremendous scope for expanding the business.
- Presently, coconuts are processed for oil.
- At present only three crore coconuts are processed and there is an excess of around seven crore nuts which are sold mostly in India.
- The processing industry works only for six months a year, that is when the weather is dry.
- Between May and December, the industry comes to a standstill, and coconuts are lost.
- So, the administration plans to introduce dryers and machinery to utilize the nuts during the wet season.
- This may increase the coconut utilization from around 50% to more than 70%.
- At present, the business in coconut and its products is worth around Rs 75 crore a year.
- With some measures, the volume of business can easily go up to Rs 200 crore.
- The coconut farmers are expected to benefit from the Union Government's 'One District One Product' program of food processing.
- In Lakshadweep, the entire island is identified as one district and coconut oil as the product.
- The financial support for the program will help to increase the coconut business on the island.
- The key factor of attention is the marketing and there are restrictions on access to other parts of India to make direct procurement.
- Now, the administration plans to have a common brand that helps the farmers market their products through an entity chosen by the administration.
- The business will have a boost by ensuring the quality of the raw material and increasing the processing facilities with value addition and marketing support.

16. Is Beef a Part of Indus Valley Civilization Diet?

- A new study finds interesting facts about the diet of Indus Valley people.
- The study found the diet of the Indus Valley Civilization was dominated by meat with extensive beef-eating.
- The new study is titled **‘Lipid residues in pottery from the Indus Civilization in northwest India.’**
- Researchers looked at the food habit of the people of that era based on lipid residue analysis found in pottery from Harappan sites in Haryana.
- Their food diet is dominated by animal products such as meat of pigs, buffalo, goats, and sheep.
- The diet also included dairy products which are used in **ancient ceramic vessels from rural and urban settlements of Indus Valley Civilization in northwest India, the present Haryana, and Uttar Pradesh.**
- Among domestic animals, **cattle or buffalo are the most abundant and averaging between 50% and 60% of the animal bones found.**
- **Sheep and goats accounted for 10% of the animal remains.**
- The study revealed that in Harappa 90% of cattle were kept alive until they were three or three and a half years.
- Males were used for traction and females for dairy production.
- **In small proportions, wild animal species like deer, antelope, gazelle, hares, birds, and riverine resources are found in the faunal assemblages of both rural and urban Indus sites.**
- According to the study, there is evidence of **hares and birds being eaten.**
- Storage of **liquids such as wine and oil have linked with Ledge-shouldered jars and large storage jars at Harappa.**

How the Study was Conducted?

- The Indus Valley Civilization was spread across modern Pakistan, northwest and western India, and Afghanistan.
- This study concentrated on five villages Alamgirpur- Meerut in UP, Masudpur-Hisar, Lohari Ragho-Hisar, and Khanak-Bhiwani, and Farman town in Rohtak district and Rakhigarhi city in Hisar.
- The research analysis was conducted on 172 pottery fragments.
- **Ceramic lipid residue analysis provides a means by which the food habits of populations can be examined.**
- **Ceramics are the most ubiquitous artifacts recovered during archaeological excavations.**
- The study also talks about plant products and regional cropping practices.
- **Barley, wheat, rice, different varieties of millets, pulses, oilseeds, fruits, and vegetables like brinjal, cucumber, grapes, date palm were grown.**

Note:

The topic is significant for prelims. as UPSC uses information such as the above about ancient Indian history to frame challenging questions. For example, UPSC might ask which of the following were the part of Indus Valley Civilization diet and give options where two might be correct and two might be wrong. If you have not read the above topic, then you will be scratching your head to answer during the exam. Later, you will rue that UPSC is asking out of

the syllabus. This never happens. UPSC frames questions from topics that have come in the newspaper 1-2 years prior to the exam date. So, be diligent in reading relevant information for CSE.

17. Cabinet Nod for Public Wi-Fi Networks:

- Cabinet approves setting up of **Public Wi-Fi networks**.
- The Union Cabinet approves the proposal of DoT for setting up of **Public Wi-Fi Networks by Public Data Office Aggregators (PDOAs)**.
- Public Wi-Fi network service is provided along the length and breadth of the country through **Public Data Offices (PDOs)**.
- Even Kirana and tea shops could become PDOs as per the plan.
- These will **accelerate the proliferation of Broadband Internet**.
- Under the plan, providers of broadband internet services through these Public Wi-Fi networks need not pay any license fee.
- The aim of the plan is to augment Public Wi-Fi Networks, increase Broadband Internet usage, enhance people's income, generate employment, and empower people.

PM-WANI:

- **The Public Access Network Interface will be known as PM-WANI**.
- Four different players are involved in the provision of PM-Wani.
- **Public Data Office (PDO):** A PDO establishes, operates, and maintains, and operates WANI Wi-Fi Access Points and delivers broadband services to subscribers.
- **Public Data Office Aggregator:** A PDOA is an aggregator of PDOs. It performs the functions relating to Authorization and Accounting.
- **App Provider:** Apps will be developed by the app providers to register users and help them discover WANI-compliant Wi-Fi hot spots in the vicinity and lets them access the internet through the app.
- **Central Registry:** It will store the details of App Providers, the PDOAs, and PDOs. The central registry will be maintained by C-DoT.

Objectives:

- Registrations are not required for PDOs, but PDOAs, and App Providers must get themselves registered at the online portal SARALSANCHAR of the DOT without paying any registration fee.
- Within seven days of the application, the registration will be granted.
- The simple registration process will be more business-friendly and in line with the ease of doing business efforts.
- The major objective of spreading the Wi-Fi networks is to create jobs, enhances disposable incomes in the hands of small and medium entrepreneurs, and can boost the country's GDP.
- PM-WANI is a step towards making India a truly Digital India by providing access to the internet everywhere in the country.

18. Athmanirbar Bharat Rojgar Yojana (ABRY):

- With the approval of the Cabinet, the government is set to launch the **Athmanirbar Bharat Rojgar Yojana (ABRY)**.
- To boost employment in the formal sector, the Union Cabinet has given its approval for the **Athmanirbar Bharat Rojgar Yojana (ABRY)**.

- Under **Atmanirbhar Bharat Package 3.0**, the scheme is expected to create new employment opportunities during the COVID recovery phase.
- For the current financial year, the cabinet approved an expenditure of Rs 1,584 crore for the scheme.
- The total expenditure for the scheme for the entire period of 2020-2023 is Rs. 22,810 crores.

Features of the Scheme:

- For any new employee engaged on or after 1st October 2020 and up to 30th June 2021, the government will provide a subsidy for two years.
- In establishments with up to 1000 employees, the government will take up to pay the 24% EPF - 12% employer's contribution and 12% employees contribution - on its own for two years.
- For establishments with more than 1000 employees, the government will pay only the 12% EPF employee contribution of the new employees for two years.
- The eligible candidate for the benefit will be an employee drawing a monthly wage of less than Rs 15000.
- Also, the employee must not be working in an establishment that has already registered with the Employees Provident Fund Organisation (EPFO) before 1st October.
- Further, prior to 1st October 2020, the employee should not have got a Universal Account Number or EPF Member account number.
- The credit of EPFO will be delivered to the Aadhaar seeded account of the members in an electronic manner.
- **EPFO** is mandated to develop the software for the scheme and to layout a procedure for maintaining transparency and accountability at the EPFO's end.
- Also, EPFO will work out the modality provided under ABRY with any other schemes implemented by EPFO so that there is no overlapping between schemes.

19. India's 1st LGBT Workplace Equality Index:

- India's first LGBT workplace equality index tool was launched.
- '**India Workplace Equality Index**' as the country's first comprehensive benchmarking tool on LGBT equality in the workplace was launched.
- **This tool will help employers to measure their progress on LGBT and inclusion at the workplace.**
- Winners were announced from among 65 companies who provided data on their diversity and inclusion practices.
- **The India Workplace Equality Index (IWEI) comes two years after the Supreme Court landmark decision of Section 377, unnatural offenses.**
- Under the gold category, 21 firms won, 18 were placed under silver and bronze 13.

India Workplace Equality Index:

- IWEI is a benchmark tool for employers to measure the progress on gay, lesbian, bi, and trans (LGBT) and inclusion in the workplace.
- **IWEI is established together by Keshav Suri Foundation (KSF), Pride Circle, and Stonewall.**
- It is based on the 15 years of Stonewall UK Workplace Equality Index.

- This tool will help the organization to navigate challenges and make progress towards the equality of LGBT.
- The index provides an easy to use framework and gives a simple structure to plan yearly work.
- The index is divided into multiple sections from employee policy to workplace culture.

Page | 22 **Metrics the Index Measures:**

1. The index measures 9 areas
2. Employee Life Cycle
3. Policies and Benefits
4. Employee Network Group
5. Senior Leadership
6. Allies and role models
7. Procurement
8. Monitoring
9. Community Engagement
10. Additional Work

20. New Rules for the Service Sector:

- The Union Government plans to bring new rules for the service sector.
- The new rules to incorporate will be flexible working hours and the option to work from home.
- For the first time in the service sector, the Labour Ministry proposed to bring a model standing order.
- The model includes rules of conduct for workers employed in the establishments.
- The proposed order for the service sector is to provide work flexibility along with the existing weekly working hours cap of 48 hours.
- Ministry also proposed an explicit work from the home provision for service sector companies.
- A model standing order will act as an overall guiding legal instrument with specific details to be filled by the employers and employees.
- The model incorporates scope for dynamic working conditions with workplaces choosing from a full work from a home model and a hybrid of work from the home model and physical workplace model.
- The Parliament passed the Industrial Relations Code in September and raised the threshold for the requirement of a standing order to over 300 workers from 100 workers.
- According to the Annual Survey of Industries, in the factory sectors, they excluded 90% of the working factories.
- For the service sectors, according to the Economic Census, 95% of the establishments don't employ even more than 20 workers.
- Experts say that under the regulations about the standing orders, service sector establishments may not be fully covered.
- Under the Shops and Establishment Act, the working hours given by the Occupational Safety, Health, and Working Conditions Code will not apply to most of the shops and establishments.

- So the model standing order may apply to as most of the non-governmental service sectors will be registered under The Shops and Establishments Act.
- This model is favorable only to a few IT sector and knowledge sector establishments and does not apply to other service sector establishments like restaurants, which is a space base working arrangements.

21. Hotspots of Climate Change:

- Indian districts are hotspots of extreme climate events.
- According to a study by the **Council on Energy, Environment, and Water (CEEW), Indian districts are hotspots of extreme climate changes.**
- In India, about **three in four districts are hotspots of climate changes such as cyclones, floods, drought, heat, and cold waves.**
- **The Council on Energy, Environment, and Water (CEEW) is a research agency.**
- Between 1970 and 2005, India faced 250 extreme climate events and 310 extreme weather events.
- Since 2000, there were 102 drought events and 79 alone in the last decade.
- The study showed a shift in the pattern of extreme climate events such as flood-prone areas into drought-prone and vice-versa in 40% of the districts.
- From the last 100 years, the current trend of catastrophic climate events results from a mere 0.6 degree Celsius.
- Globally, India is the fifth most vulnerable country in terms of extreme climate events and set to become capital for the world's flood.
- For vulnerable countries like India, it is critical for building climate resilience as access to finance and technology along with the democratization of weather and climate-related data is difficult.
- In India, 97 million people are being exposed to extreme floods. Most flood-prone districts are Barpeta, Goalpara, Darrang, Dhemaji, Golaghat, and Sivasagar in Assam.
- For the last 50 years, a 12 fold surge was recorded in the number of associated cyclonic events such as extreme rainfall, floods, and thunderstorms.
- After 2005, the drought-affected districts increased by 13 times.
- In the country, 68% of districts have been facing drought and drought-like situations.
- The hotspots of drought-affected districts are Ahmednagar, Aurangabad, Anantapur, Bagalkot, Bijapur, Chittoor, Chikkaballapur, Gulbarga, and Hassan.
- The intensity of damage of loss of life has reduced significantly but increased the uncertainties related to agriculture and rural livelihoods.
- Maharashtra recorded a 7 fold increase in drought events and a six-fold increase in the frequency of extreme flood events.
- The team used information from globally validated data sheets and the Indian Meteorological Department, Press Information Bureau, and World Meteorological Department.
- In Maharashtra, there were only 19 extreme floods that are over 204.5mm rain in 24 hours in 2009-2019.
- In 2000-2009, there were only 9 extreme flood events.
- The main hotspots in Maharashtra include districts of Mumbai, Thane, and Ratnagiri.

22. India Is Readying a Policy for 3D Printing:

- The Union Government readies 3D printing policy for local firms.
- The **Ministry of Electronics and Information Technology** is coming up with **a policy aimed at promoting 3D printing on an industrial scale.**
- This will help the local firms to overcome technical and economic barriers and can build supportive and ancillary facilities for the US and China.
- **The Government policy will help to develop a conducive ecosystem for the design, development, and deployment of 3D printing and additive manufacturing.**
- 3D printing and a viable industry make specific products for projects with specific demands such as lightweight equipment, etc.
- **By 2024, the global market for additive manufacturing is expected to reach \$34.8 billion with an annual growth rate of 23.2%.**

3D Printing:

- 3D printing uses computer-aided designing to make prototypes or working models of objects.
- The working models will be laid down successive layers of materials such as plastic, resin, thermoplastic, metal, ceramic, and fibre.
- The model to be printed is first developed by the computer with the help of software and then gives instructions to the 3D printer.
- According to the draft policy, the government will look to encourage market leaders to establish a global market for 3D printing and also discourage the import of printed material.
- The key applications for 3D printing are in the medical and allied sectors.
- The other key areas include auto and ancillary industry for manufacturing auto and motor spare parts, engines, interior and exterior parts of luxury vehicles, landing gear, complex brackets, and turbine blades.
- Some more applications are consumer electronics, printed circuit boards, clothing toys, and jewellery.
- About 50% of 3D marketing is cornered by China and Asia leads the world in it.
- This is followed by 30% in Japan and 10% in South Korea.
- Globally, the US is the leader with more than 35% of the market share.
- Domestically, India is at a research and development stage.

23. Connectivity Projects in Afghanistan:

- Recently, India and Uzbekistan have discussed to cooperate on connectivity projects in Afghanistan.
- Both plan to cooperate on connectivity projects in Afghanistan.
- It will also participate in a trilateral dialogue with Iran.
- Both the countries addressed the need to fight terrorism and shared the vision on the future of the Afghanistan peace process.
- India expressed its concerns on extremism, fundamentalism and separatism.
- Both countries stand firmly together against terrorism and have a similar approach to regional security issues.
- Last year, both countries conducted the first joint military exercise between the two armed forces.

- Two countries are increasing their bilateral relations in the areas of space and atomic energy.
- India confirmed the approval of four developmental projects worth a \$448 million Line of Credit.
- The developmental projects are in areas such as road construction, sewerage treatment, and information technology.
- Some specific projects under the Line of Credit were being identified.
- The two countries signed several Memorandums of Understandings (MoU) and a Dollar Credit Line Agreement between the Exports and Import Bank of India and the Uzbekistan Government.
- They also signed MoUs in the areas of renewable energy and information technology.
- Officials were directed to fast track the conclusion of the Joint Feasibility Study which will pave way for the commencement of negotiations on a Preferential Trade Agreement.
- The current bilateral trade level between the two countries is about US \$285 million.

24. Influence of North Atlantic Air Currents:

- A new study shows how droughts influenced by North Atlantic air currents.
- The research was conducted at the Centre for Atmospheric and Oceanic Sciences (CAOS), Indian Institute of Sciences (IISc).
- Researchers found that nearly half of the droughts that occurred in the past century during the Indian summer-monsoons season have been driven by atmospheric disturbances in the North Atlantic region.
- The study revealed that droughts were caused due to a sudden and steep drop in rainfall in August. This is related to an atmospheric disturbance in the mid-latitude region over the North Atlantic Ocean.
- This created a pattern of atmospheric currents and swooped in over subcontinent derailing the monsoon.
- All these droughts may have a different type of evolution than El Nino droughts.
- Researchers monitored the daily rainfall during both the El Nino and Non El Nino drought years and noticed their differences and patterns between June and September.
- During the El Nino period, the droughts that happen followed a standard pattern.
- The rainfall deficit from a long term average set in around mid-June and becomes progressively worse.
- Firstly, there was a moderate slump in June and during mid-July to mid-August.
- During the peak of the season, there were signs of monsoon and rainfall increased.
- Around the third week of August, there was a sudden steep decline in rainfall and this resulted in drought.
- Researchers began to trace why the break occurred and noticed an unusual atmospheric disturbance in the mid-latitudes.
- The disturbances occurred from winds in the upper atmosphere interacting with deep cyclonic circulation above abnormally cold North Atlantic waters. The resulting air currents are called as **Rossby wave**.
- The air currents curved down from the North Atlantic and squeezed the Tibetan plateau and hit the Indian subcontinent around mid-August.

- This will suppress the rainfall and throws the monsoon that was trying to recover from the June slump.
- Some droughts that occurred during non-El Nino period during the Indian Monsoon season.
- These findings are important to know the patterns of Indian monsoons from outside the tropics.

25. Reviving the Grasslands of Western Ghats:

- Researchers identified sites for the **restoration of Tropical Montane (TM) grasslands of Western Ghats.**
- The Tropical montane grasslands in the Shola highlands of Western Ghats suffered huge reductions in their range.
- The invasion of exotic trees such as pines, acacias, and eucalyptus is the main reason for the decline of the grasslands.
- This has led to shrinking the range sizes of many endemic plants, birds, amphibians, and mammal species.
- The damage is so severe that some of the species are driven to local extinction.

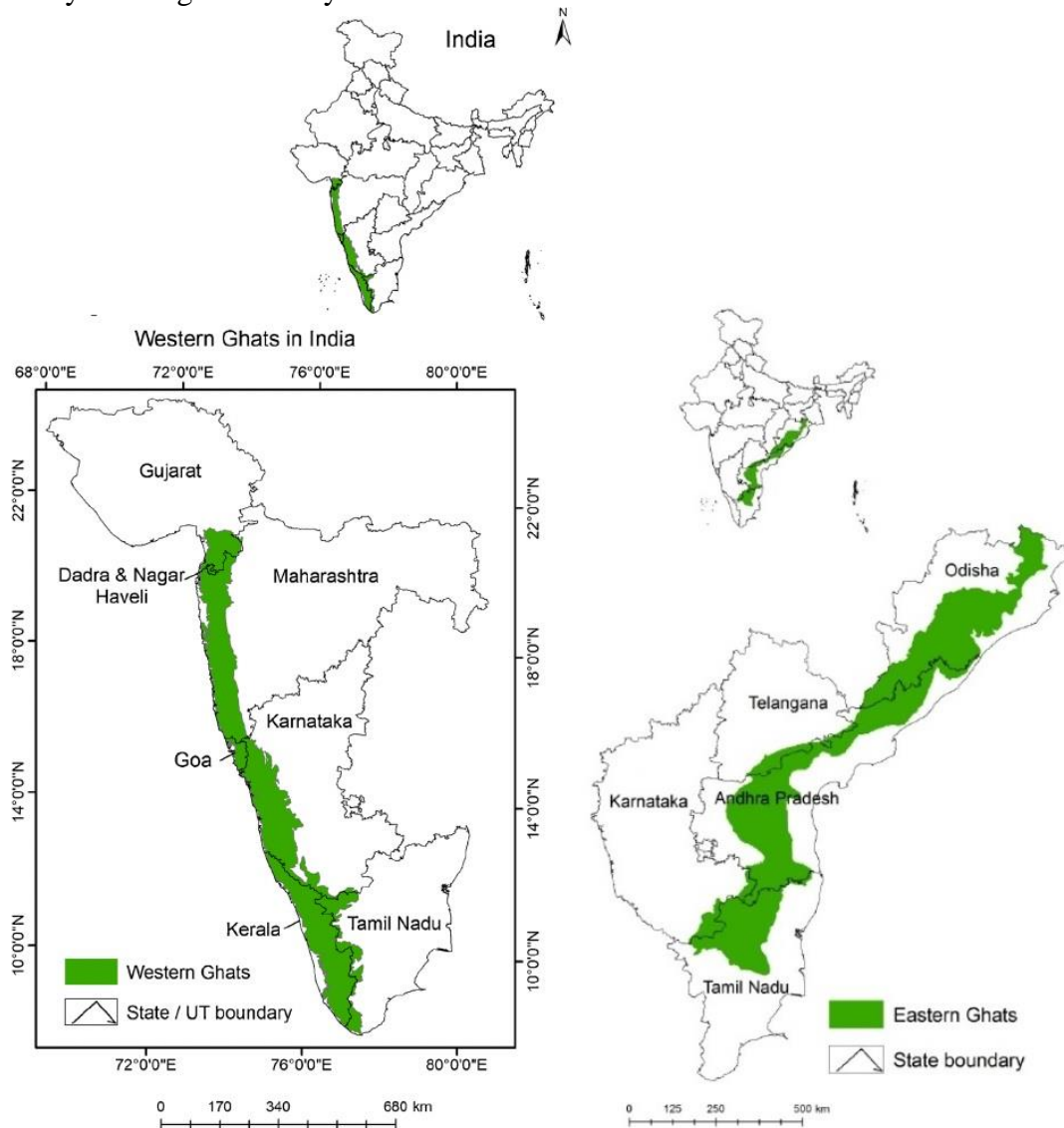
The Research:

- The research on grasslands restoration has been jointly conducted by the Indian Institute of Science Education and Research (IISER) Tirupati and Ashoka Trust for Research in Ecology and the Environment (ATREE) Bengaluru.
- Researchers used satellite images with a high spatial resolution (Rapid Eye) for identifying grassland restoration sites.
- They also recommended the removal of young and isolated exotic trees at the invasion spots for grasslands restorations.
- Researchers preferred not to remove dense stands of mature exotic trees.
- They also noted that the grasslands do not benefit from conservation and restoration efforts due to limited information.
- In the Western Ghats, 23% of TM grasslands were converted into invasive exotic tree cover for 44 years.
- Researchers suggested an approach that targets the removal of young exotic trees instead of mature trees.
- The team identified an area of 254 sq km for the restoration of grassland and 362 sq km of intact tropical montane grasslands for conservation.
- They also identified 606 sq km of mature exotic tree stands in the Nilgiris, Anamalai, Palani Hills.
- The areas for grassland restoration were identified in the Nilgiris 126 sq km, Palani Hills 73 sq km, and Anamalai 55 sq km.
- The largest areas for restoration were in reserve forests of 87 sq km and wildlife sanctuaries of 60 sq km and national parks.
- Due to the invasion of species, the Anamalai and Palani hills lost their grasslands.

TMG Grasslands:

- **Tropical Montane Grasslands are high elevation grasslands.**
- **These grasslands are only 2% of all grasslands in the world.**

- The key function of this grassland is to regulate the global carbon cycle and also serves as a source of water to downstream communities.
- In India, these grasslands are considered as wastelands in forest management plans as they do not generate any revenue.



26. Israel-Morocco Deal to Normalize Ties:

- Morocco is the fourth Arab country to normalize ties with Israel in the last five months.
- On December 10, the US announced the deal between the Arab countries the UAE, Bahrain, Sudan, and Morocco and the Jewish state to bring peace in West Asia.
- Morocco's ties with Israel may lead to the revival of an old conflict regarding the Western Sahara as the US has recognized Rabat's sovereignty over Western Sahara.

The Dispute:

- Western Sahara is a disputed territory in northwestern Africa that is under Morocco's control

- Morocco has been campaigning internationally for recognition of its claim to Western Sahara using its economic pressure and diplomacy.
- Western Sahara shares borders with Morocco, Algeria, Mauritania and has a long Atlantic coast.
- It was once a Spanish colony and is home to the **Sahrawi tribe**.
- In the 1970s, when Spain vacated its colonies in Africa, Libya and Algeria, it kept Western Sahara to itself. The Sahrawi formed an insurgency group against the Spanish rule.
- They started guerilla warfare through the popular front of the Liberation of Saguia el Hamara and Rio de Oro known as the Polisario Front.
- In 1975, Spain decided to leave the territory as part of the Madrid Accords with Morocco and Mauritania which was called the Spanish Sahara.
- Spanish Governor-General administered the territory with the help of two Moroccan and Mauritanian Deputy Governors till February 28, 1976.
- The agreements were opposed by the Polisario Front and Algeria.
- To assert their claims both Morocco and Mauritania moved their troops to Western Sahara and Polisario backed by Algeria.
- On February 27, 1976, the Polisario Front declared the Sahrawi Arab Democratic Republic (SADR) in Western Sahara which also became a member of the African Union.

Morocco's Claim:

- Even when it was a Spanish colony, Morocco and Mauritania had claimed Western Sahara.
- In 1974, the UN General Assembly had asked the International Court of Justice to look into the legality of the claims.
- There was no evidence of any ties of territorial sovereignty.
- The court endorsed the General Assembly Resolution 1541 which affirmed to ensure decolonization, complete compliance with the principle of self-determination.

Current Status:

- In August 1979, a peace treaty was signed by Mauritania with Polisario.
- The war continued between Moroccan troops and the Polisario troop and a ceasefire was achieved in 1991.
- Now, Morocco had taken control of about 80% of the territory.
- Due to the war, 200,000 Sahrawis flee to the neighboring country Algeria.
- The SADR operates from the eastern flank of Western Sahara and Morocco built a huge sand wall called Berm
- The Berm was constructed from the Atlantic coast to the mountains of Morocco.

Impact of the Deal:

- The deal between Morocco and Israel will not have any direct impact.
- But the USA has given recognition to the Moroccan occupation of Western Sahara.
- The possible outcome would be Morocco launching an offensive into the UN-controlled buffer zone and Polisario resuming its armed conflict.
- The country which was against the US decisions in Russia.

Israel Ties with Bhutan:

- In another geopolitical news, Bhutan and Israel have established formal ties and a formal ceremony was held in New Delhi.
- This move follows a flurry of diplomatic activities in both countries.

- Bhutan and Israel will cooperate in various activities and agricultural training.
- Israel's Agency for International Development Cooperation (MASHAV) has trained hundreds of Bhutanese youth since 2013.

27. Plasmodium Ovale - A New Malaria Type Identified:

- Plasmodium Ovale, a type of malaria has been identified in jawan in Kerala.
- The soldier contracted during his posting in Sudan and returned a year back.
- Plasmodium Ovale is endemic.

Types of Malaria:

- The main cause of malaria is the bite of the female Anopheles mosquito when it is infected with the malaria parasite.
- There are different types of malaria parasites which include Plasmodium falciparum, plasmodium vivax, plasmodium ovale, plasmodium malariae, and plasmodium knowlesi.
- The most common type of malaria is caused by plasmodium vivax.
- In 2019, in India, there are 1.57 malaria cases.
- The high burden cases were recorded in the states Odisha, Chhattisgarh, Jharkhand, Meghalaya, and Madhya Pradesh.
- Out of the total malaria cases, 1.1 lakh cases (70%) were cases of falciparum malaria.
- In 2018, the National Vector-borne Disease Control Programme (NVBDCP) recorded 5 lakh people suffered from malaria where 63% were from plasmodium falciparum.
- According to the World Malaria Report 2020, India dropped from about 20 million in 2000 to about 5.6 million in 2019.

Plasmodium Ovale:

- Plasmodium Ovale rarely causes severe illness.
- It is similar to Plasmodium vivax and is not a killer.
- The symptoms include 48 hours of fever, nausea, and headache.
- The treatment is similar to a person who is infected with Plasmodium vivax.
- The 20% of parasites cells are oval shapes and thus is termed as Ovale.

Cases in India:

- According to the National Institute of Malaria Research (NIMR), the case in Kerala is an isolated one and there is no local transmission.
- Previously, isolated cases were reported in Gujarat, Kolkata, Odisha, and Delhi.
- Researchers did a rapid antigen test to detect the strain and diagnosed Plasmodium Ovale.
- The parasite may remain in the liver or spleen of the body for a longer time.

Around the World:

- Plasmodium Ovale the cause of malaria is endemic to tropical Western Africa only.
- According to the NIMR, Plasmodium ovale is unusual outside of Africa but when found comprises less than 1%.
- P ovale also been detected in the Philippines, Indonesia, and Papua New Guinea.
- In the China-Myanmar border, the plasmodium ovale and plasmodium malariae have low prevalence.
- In China's Jiangsu Province, malaria cases decrease significantly over 2011-2014 but there was an increase in Plasmodium ovale and plasmodium malariae cases.

28. NFHS on Malnutrition in Kids:

- The Union Ministry of Health and Family Welfare released the **first phase data of the National Family Health and Survey (NFHS) 2019-20. When all the phases are complete, the survey becomes NFHS-5.**
- Despite dramatic improvements in sanitation and access to fuel and drinking water, several states have recorded worsening levels of child malnutrition.
- The latest data is recorded for 17 states that include Bihar, Maharashtra, West Bengal and 5 Union Territories and J&K.
- In Phase 2, states like Uttar Pradesh, Madhya Pradesh and Punjab will be covered and the results are expected to be out by May 2021.
- The first data phase shows that several states have witnessed **a rise in child malnutrition under 5 years of age with parameters such as child stunting, child wasting, child mortality and share of children underweight.**
- The parameters used for measuring child malnutrition by NFHS is similar to that of the **Global Hunger Index.**
- **Child wasting is acute undernutrition. This refers to children having low weight for their height.**
- **States which witnessed high child wasting were Telangana, Bihar, Kerala, Assam and UT of J&K.**
- Maharashtra and West Bengal were stagnant on Child Wasting.
- As per NFHS, the proportion of underweight children has increased in Gujarat, Maharashtra, West Bengal, Telangana, Assam and Kerala.
- **The reverse happened in child stunting which reflects chronic undernutrition and refers to the percentage of children who have low height for their age.**
- **Stunting may have long-lasting adverse effects on the cognitive and physical development of a child.**
- There were increased levels of stunting in states Telangana, Kerala, Gujarat, Maharashtra and West Bengal.
- Under 5 Mortality rate data is stagnant in several states.
- Infant Mortality Rate refers to several deaths per 1000 live births for children under the age of 1.
- Between NFHS-3 of 2004-05 and NFHS 4 of 2015-16, there was progress in infant mortality reduction.
- In NFHS-3, there were 74 deaths per 1000 births Under 5 Mortality.
- In NFHS-4, there were 50 deaths per 1000 births Under 5 Mortality which shows a decline of 33% over 10 years.
- **NFHS-5 and NFHS-4 are five years apart but have very little progress in many states.**
- In Maharashtra and Bihar, the Under 5 Mortality Rate is the same in NFHS-5 and 4 and 3% over five years.
- Child mortality is related to child malnutrition.
- **The NFHS-5 included new points such as disability, preschool education, and access to toilet facility, death registration, bathing practices during menstruation, methods and reasons for abortion.**
- An interesting fact to notice in the report is that the states which reported high child under nutrition and stunting are in fact rich states of the country. They are industrial powerhouses of the country and contribute a large share of the country's GDP. Yet, the

child malnutrition numbers in these states did not represent the economic progress of these states. This clearly shows that the priorities of these states lie elsewhere than on giving children their rightful opportunity in life.

- The majority of the population in the country leads a life on a thin wire where even a minor financial catastrophe pushes them into poverty and it is the children who bear the brunt in the form of hunger and malnutrition.
- Though the government has launched many schemes to alleviate hunger and malnutrition in the country, it seems the benefits are not reaching the needy. It is time, India takes concrete steps to eradicate child hunger and malnutrition in the country.

29. Myristica Swamp Treefrog:

- The rare and elusive **Myristica Swamp Treefrog** was recorded in Kerala for the first time.
- Myristica Swamp Treefrog **is an endemic species and is found only in the Western Ghats.**
- The **scientific name** of the species is **Mercurana myristicapalustris.**
- The rare frogs were sited at the **north of the Shencottah gap in the Vazhachal Reserve Forest in Kerala's Thrissur.**
- These frogs were identified during an exploration study by scientists from the University College, Thiruvananthapuram near the road at Sukthae pocket swamp in the Vazhachal forest division in 2018.
- Researchers discovered a group of adult frogs calling for low perches in a swamp.
- **Generally, the myristica swamp treefrogs are found in the foothills of the Agasthyamalai.**
- These frogs were active throughout June and early July.
- **These species adapted to a non-Myristica swamp predominant with the plant polyalthia fragrans.**
- **In 2013, the frog was first spotted in the Myristica swamps of Arippa, the Kulathaupuzha Reserve Forests in the western foothills of Agasthyamali in the Kollam district.**
- The species is found 170 km to the north of Arippa.

Unique Traits:

- These frogs are rare and elusive.
- **They are arboreal and active only for a few weeks during their breeding time.**
- A large aggregation of males descend from the high canopy of trees during this season.
- In the swamps, the males vocalize in groups from low perches.
- The breeding season for these frogs being in May, the pre-monsoon season and ends in June, before the onset of monsoon.
- By the time the season ends, both the male and female pairs descend to the forest floor to lay eggs.
- The female lays the eggs by digging the mud and making shallow burrows.
- After laying eggs, they retreat to the high canopies of the tree and remain elusive till the next season.

- The extended distribution of such rare frogs in the Western Ghats has conservation implications.
- They also provide a suitable niche for further studies on the diverse amphibian fauna of the Ghats.
- The rainforest of the Western Ghats still throw up new species that have eluded human beings for a long time. With more field studies, many new species will definitely come to light in the future.

30. Gender Gaps in Internet Usage:

- According to the data collected by the fifth National Family Health Survey (NFHS), there is an urban-rural gap and also a gender gap in the use of the internet.
- The NFHS survey was conducted in 22 states and union territories.
- According to the survey, only 3 of 10 women in rural and 4 of ten women in urban ever used the internet.
- Generally, NFHS collects the data with key indicators like population health, family planning, nutrition etc.
- In 2019, NFHS collected data on the percentage of women and men who have ever used the internet and this is for the first time.
- According to the NFHS, an average of 42.6% of women ever used the internet as against an average of 62.16% among men in Urban India.
- An average of 56.81% of women ever used the Internet compared to average 73.76% among men.
- In rural India, 33.94% of women ever used the Internet as against 55.6% of among men.
- The data is collected from 3.07 lakh households from the 22 states and union territories.
- Of these, there are only 10 states and 3 union territories, that reported 50% or more women having used the internet ever..
- The states and UTs are Goa-78.1%, Himachal Pradesh-78.9%, Kerala- 64.9%, Maharashtra- 54.3%, Manipur-50.8%, Meghalaya- 57.8%, Mizorma-83.8%, Nagaland-66.5%, Sikkim-90%, J&K-55%, Ladhak-66.5%, Lakshwadeep-61.80%.
- The lowest percentage of urban women who ever used the internet is from Andhra Pradesh-33.9%, Bihar-38.4%, Tripura-36.6%, Telangana-43.9% and Gujarat-48.9%.
- In rural India, the percentage of women who ever used the internet was very low with states like West Bengal (14%), Andhra Pradesh (15.4%), Telangana (15.8%), Tripura (17.7%) and Bihar (17%) reporting less than 20% usage.
- Tripura is the only state which reported 47% of men who ever used the internet in urban India, lowest in the country.
- The worst performing states in urban India where internet usage by men was low were Bihar-58.4%, Meghalaya- 59.2%, West Bengal-64.6%, Andhra Pradesh-65.1% and Assam-67.4%.
- In rural India, eight states reported more than 50% of whoever used the internet.
- This include Goa-76.6%, Himachal Pradesh-65.1%, Karnataka-55.6%, Kerala-74.2%, Manipur-68.2%, Mizoram-63.9%, Nagaland-55.2% and Sikkim-69.5%.
- The worst performing states in urban India were Assam-37.8%, West Bengal-38.3%, Meghalaya-38.5%, Bihar-39.4%, and Andhra Pradesh-41.3%.

- The NFHS is an indicator to track 30 Sustainable Development Goals that India aims to achieve by 2030.
- The Phase 1 of the NFHS survey measured 131 key indicators with an emphasis on maternal and child health.

Page | 33 **31. US Sanctions Turkey over S-400 Deal and India's Caution:**

- Recently, the US imposed sanctions on Turkey for the purchase of Russian S-400 air defence systems.
- Ankara said that its acquisition is of no threat to the NATO allies.
- The sanctions come amidst the dwindling relations between Turkey and the US. Last year, Washington removed Turkey from an F-35 jet program.
- For India, the sanctions on Turkey is significant as it is set to get the consignment of the S-400 air defence system next year.

What is an S-400 air Defence missile?

The **S-400 Triumf** is a **mobile ground-to-air missile system (SAM)** and designed by Russia.

- NATO calls S-400 as SA-21 Growler.
- In the world, S-400 is the most dangerous operationally deployed modern long-range SAM.
- It is considered much ahead of the US-Developed Terminal High Altitude Air Defense System (THAAD).
- The missiles can target aircraft, unmanned aerial vehicles, and incoming ballistic and cruise missiles within the range of 400km and at an altitude of up to 30km.
- It can also track 100 airborne targets and can engage six simultaneously.
- S-400 is the successor of the S-200 and S-300 and is the fourth generation SAM.
- The S-400s mission is comparable to the famed US Patriot system.
- This system comes with integrated multifunctional radar, autonomous detection and targeting systems, anti-aircraft missile systems, launchers, and a command and control centre.
- It can create a layered defence by firing three types of missiles.
- The S-400 is two times effective than the previous Russian air defence system.
- It can be deployed in five minutes and can integrate into the existing and future air defence units of the Army, Navy, and Air Force.
- It became operational in 2007 and is responsible for defending Moscow.
- To guard the Russian and Syrian naval and air defence, it was deployed in Syria in 2015.

Why does India Need It?

- From India's point of view, China is also buying the system and is viewed as a game-changer.
- Beijing signed an agreement in 2015 with Russia to purchase six battalions of the system and its delivery started in 2018 January.
- According to experts, its effectiveness against India is limited.
- India's acquisition is crucial to counter attacks in two-front war even high-end F-35 US Fighter aircraft.
- Defence Acquisition Council in October 2015 considered buying 12 units of S-400.
- But in December 2015, it considered buying only 5 units and the deal was worth of about USD 5 billion.
- The deal is at an advanced stage and is expected to sign before a summit meeting.

- While Turkey and Saudi Arabia are negotiating the deal with Russia and Iraq and Qatar expressed their interest.

What is CAATSA?

- **Countering America's Adversaries through Sanctions Act (CAATSA)** was passed unanimously by the US Congress and was enacted on August 2, 2017.
- Its main objective is to counter Iran, Russian, and North Korea through punitive measures.
- Title II of the Act primarily deals with Russian interests.
- This includes the Russian oil and gas industry, defence and security sector, and financial institutions.
- The measures were brought in the and in the backdrop of Russia's military intervention in Ukraine and its alleged meddling in the 2016 US Presidential elections.
- Under Section 231 of the Act, the US President has the power to impose sanctions on persons having noticeable transactions with Russia on at least five counts of the 12 enumerated in section 235 of the act.
- Based on these sections, the US State Department notified 39 Russian entities. Any dealing with these entities will attract sanctions from the US.
- The 39 entities include Russia's major defence equipment manufacturing companies like Rosoboronexport, Almaz-Antey, Sukhoi Aviation, Russian Aircraft Corporation MiG, and United Shipbuilding.
- CAATSA though mentions the names of these companies, to actually attract sanctions the key determinant is "significant transaction" between the Russian entity and outside agency.
- If implemented strictly, India would have attracted sanctions for its defence procurement from Russia.
- The Russian S-400 maker Amaz-Antey Air and Space Defence Corporation JSC is on CAATSA's list.

Why Did the US Come Up With CAATSA?

- After the 2016 Presidential election, where it was found that Russia has meddled with the elections, the US lawmakers wanted to hit Russia hard where it hurts most.
- Russia's defence and energy businesses were the target.
- For India, Russia is the top-most arms supplier. As per the Stockholm International Peace Research Institute (SIPRI) Arms Transfer Database, during the 2010-17 period Russia's share in India's arms imports was 68% which was actually a decline from the all-time high of 74% in the 2000s. Significantly, during the same period, imports from the US and Israel increased from 9% to 19%.
- The report also shows that in the 2013-17 period, Russia's share further declined to 62% and the US's share increased to 26%, effectively becoming India's second-biggest defence supplier.

Exemption for India:

- At a time when the US is projecting India as a key partner in its Indo-Pacific strategy, CAATSA could impact the India-US ties.
- Some in the US defense administration have requested exemptions for India as the country provides a strategic opportunity in the Pacific region against a belligerent China.

- After hectic lobbying, the CAATSA came into effect this year in January. A US congressional committee proposed waivers for India from CAATSA's stringent provisions.
- Then the Senate and House Armed Services Committee provided a modified waiver section in National Defense Authorisation Act (NDAA)-2019, which will be moved in the Senate and the House for passage.
- Though the waiver does not explicitly name countries like India, Vietnam and Indonesia, the waiver would benefit these countries.

What Are the Benefits for the US in Doing So?

- The United States sees India as a major market for its defence industry. In the last 10 years, from zero the US defence industry now has defence trade worth \$15 billion with India.
- The arms deals include C-17 Globemaster and C-130J planes. P-8 (I) reconnaissance aircraft, M777 light-weight howitzer, Apache helicopters, Harpoon missiles and Chinook helicopters.
- The noticeable point is, between 2013-14 and 2015-16, in terms of number and value, the US is way ahead of other suppliers.
- It is set to increase further as the US has agreed to supply Sea Guardian Drones for India.
- Further, many US defence companies are contending for many of India's high-profile arms procurement that includes fighter planes, carrier-borne fighters, naval and multi-role helicopters.
- How Do Turkey's Sanctions Complicate the Issue?
- Turkey, despite repeated calls from the US administration to not buy S-400 missiles from Russia, has bought them anyway.
- The US, citing no other option but to sanction Turkey has invoked CAATSA against Turkey, a NATO alliance member.
- Turkey called the sanctions a mistake and rejected the US's offer to resolve the issue.
- It is to be seen how the new President Joe Biden will handle the ties with Ankara.

Is India off the Hook?

- India is off the view that Washington will understand its security imperatives especially in light of a stand-off with China and will exempt India from sanctions.
- Even the US Administration is not willing to degrade ties with India which is a 'Major Defence Partner'.
- But, how the Biden administration will act will also reflect how much the US understands India's concerns on China. It will be a litmus test for the new administration in the US.

32. India Falls Two Places in HDI:

- **According to the latest Human Development Index Report, India fell by two places and ranked at 131.**
- The United Nations' Human Development Index 2020 measures human development indices in 189 countries.
- Of the 189 countries, India is ranked at 131, a drop in two places from the previous year.
- But, if the index is adjusted to the planetary pressures that the world is facing now, India would jump by eight places, the report added.

A New Metric:

- The United Nations Development Programme (UNDP) has introduced a new metric in the 2020 HDI.
- **The new metric measures the number of fossil fuels, metals, and other resources that a country uses to make goods and services that it consumes.**
- **It reflects the country's per-capita carbon emissions and its material footprint.**
- If this metric is used, Norway, which is top-ranked in HDI will fall by 15 places and puts Ireland at the top.
- Overall, 50 countries will be affected by the new metric called the **Planetary Pressures-adjusted HDI or PHDI.**
- **With PHDI, these 50 countries would drop out of the “very high human development group”.**
- Australia would fall 72 places, the US and Canada would fall 45 and 40 places, which clearly shows their disproportionate impact on natural resources.
- Also in this category are the Gulf States.
- As per the report, China would fall by 16 ranks, which is currently ranked at 85.
- China's net emissions of 8 gigatonnes are 34% below its territorial emissions (12.5 gigatonnes) compared to India's 19% and sub-Saharan Africa's 15%.

Strain on Resources:

- A very high level of development without straining the resources hasn't been achieved by any country so far.
- As for now, India has a good record of achieving its carbon emissions.
- The Human Development Index itself is an assessment of a nation's health, education, and standards of living.
- The 2020 report covered only the year 2019 and did not take into account the impact of COVID.
- **India Metrics**
- Though India is ranked lower than the previous year, in 2019, India's absolute value of the index has grown up to **0.645 compared to 0.642 in 2018**. This shows that India's overall performance was better.
- In all the four indicators India's performance improved in 2019 than in 2018.

	2019	2018
Life Expectancy	69.7	69.4
GNI Per Capita	\$6681	\$6427
Expected Years of Schooling	12.2 and 6.5 years	12.2 and 6.5 years

33. Is India a Currency Manipulator:

- The US has put India on a monitoring list of countries with potentially “questionable foreign exchange policies” and “currency manipulation”.

- This comes after a year India had been removed from the list by the US Treasury Department.

The Meaning of Currency Manipulator:

- The US government labels any country that is engaged in wilfully devaluing its currency against the dollar as a currency manipulator.
- IT means the country in question is lowering its currency value intentionally to be advantageous over other countries.
- Devaluation reduces export costs and artificially shows a reduction in trade deficits.

Labeling Currency Manipulator - The Parameters:

- As per the US' Trade Facilitation and Trade Enforcement Act of 2015, an economy is placed under the monitoring list if it meets two to three of the following criteria:
- Over a 12-month period, the country in question must have a significant trade surplus with the US, at least \$20 billion.
- The material current account of the country is in a surplus of at least 2 percent of GDP over a period of 12 months.
- Over a 12-month period, the country should have carried out net foreign currency purchases totaling at least 2% of the GDP.
- Once a country is on the monitoring list, it will stay there for at least two reports. This is to help the US Treasury ensure that the improvement in a country's performance is durable and not due to temporary factors.
- Also, any major US trading partner with a large and disproportionate share in the US trade deficit will be added and retained on the list. This, even if that country has not met any two of the three criteria mentioned in the Act.

Countries on the List:

- In the latest monitoring list, the US Department of Treasury included India, Thailand, and Taiwan to the list.
- The Department warranted close attention on these major trading partners due to their currency practices and macroeconomic policies.
- Other countries on the list are Germany, China, Japan, Italy, Korea, Malaysia, and Singapore.
- India was included on the watchlist in 2018 and was removed in May 2019.
- The name of a country on the list means it does not immediately attract any penalties, but it will dent its confidence in global financial markets.

Return of India on the List:

- India has a significant bilateral goods surplus with the US for several years crossing the \$20 billion mark.
- Up until June 2020, India's goods trade surplus increased to \$22 billion.
- The report notes that India's central bank RBI had purchased significant amounts of foreign exchange in the second half of 2019
- This, followed by the net purchase of foreign exchange in the first half of 2020 which amounted to \$64 billion or 2.4% of the GDP. This is why India is on the list.

34. Launch of Communication Satellites:

- The Indian Space Research Organisation (ISRO) had successfully launched the 42nd communications satellite, CMS-01.

- It was carried on board by the **PLSV-C50** from the second launch pad of the Satish Dhawan Space Centre, Sriharikota.
- The PSLV is India's workhorse launch vehicle and **this is its 52nd mission.**
- PSLV-C50 is configured with the XL version with six strap-on motors.
- The launch vehicle had put the satellite precisely in a geosynchronous transfer orbit (GTO), 20 minutes after lift-off.
- The next launch of the **PLSV-C51** is a **special mission for ISRO** as the vehicle will be carrying the **country's first private satellite under the space reforms program.**
- Within 8 months of the government announcement of the reforms, ISRO will be launching the country's first private satellite from **Pixxel India named Anand.**
- **Satish Sat from Space Kidz India and Unity Sat from a consortium of universities are two more private satellites set to be launched in the coming months.**
- Earlier, ISRO had placed **India's Earth Observation Satellite, EOS-01, and nine other customer satellites on November 7.**

CMS-01:

- CMS-01 is a communication satellite.
- It provides the service in the **extended C Band** of the frequency spectrum.
- It will **cover the Indian mainland and the Andaman & Nicobar and Lakshadweep islands.**
- This satellite has a **life of seven years.**
- The satellite was injected into its pre-defined sub-GTO orbit.
- This satellite will act as a continuation of the GSAT-12 which was launched 11 years ago.
- Indian Satcom Policy
- In the year 1997, the Department of Space in partnership with the Department of Telecommunication and the Department of Science has brought out the Indian Satellite Communication Policy (SATCOM Policy).

The thrust of the policy is

1. to develop satellite communication, launch vehicle, and ground equipment industry in India
2. to make available the Indian National Satellite System (INSAT) infrastructure to a larger segment of the economy
3. encouraging the investment by the private sector in the space industry in India and attracting foreign investment in the satellite communication sector.
 - The Satcom Policy though intended the participation of the private players in satellite communication, did not specify how to implement the policy.
 - In 2000, the Department of Space brought out the norms and guidelines for implementing the SATCOM policy.
 - Yet, private participation was negligent which led to the government controlling the Indian space industry.

The Reforms:

- The change was thrust upon the Indian government in the form of financial woes brought by the COVID-19 pandemic.
- In June 2020, the Department of Space announced the establishment of a new regulatory body, the Indian National Space Promotion and Authorization Centre (IN-SPACe).
- IN-SPACe brought in the much-needed transparency in the Indian space market.

- It will act as a regulatory body and a facilitator for private firms to carry out space-based activities in the country.
- The new body is set up as the fourth vertical under ISRO, yet it will neither affect ISRO's functioning nor will be influenced by ISRO.
- Thus, IN-SPACe has the freedom to make decisions on providing testing facilities or ground satellite systems to private companies.
- Private firms can now develop their own satellite technology or other space systems and utilize ISRO's launch facilities for a fee.
- The expected launch of Anand is a culmination of this major space reform.

Target 500:

- For the growing communication needs of the country, ISRO had set a target of having 500 transponders in space.
- Transponders are specialized communication devices that automatically pick up and respond to incoming signals.
- But currently, it has only 200 transponders and many of the old communication satellites are set to retire.
- ISRO has thus a mammoth task of augmenting the satellite communication capacity, lest, users will move on to satellite systems from other countries.
- Already, many agencies are hiring foreign transponders.
- ISRO is set to fill the gap with the launch of many high-throughput satellites in the coming years.

35. Yoga Asana - Now a Competitive Sport:

- In India, yoga asana will be a competitive sport.
- Now the **Ministries of AYUSH- Ayurveda, Naturopathy, Unani, Siddha, Homeopathy, and Youth Affairs and Sports** announced that they will take the sport globally.
- To promote yoga asana as a sport, the central government consulted extensively with the stakeholders for the last three to four years.
- The recommendation was proposed by the National Board of Promotion and Development of Yoga and Naturopathy in 2019.
- The Board prepared a document containing the rules and regulations and syllabus for the sports.
- The technical committee prepared a list of yoga asana after the research from the traditional books on yoga.
- The Board proposed the district, State, and World Championships in yoga asana in 2021.
- They are also working on the automation of the scoring system to introduce objective in marking.
- In February 2021, a pilot championship of traditional yoga asana named **National Individual Yoga Asana Sports Championship** in a virtual mode will be conducted.
- Currently, they are developing a patent electronic scoring system for yoga asana championships in the country and globally along with courses and certification.
- **The yoga asana as a sport will have 51 medals in four events and seven categories.**
- The events proposed are both for men and women and include traditional, artistic-single and pair, rhythmic-pair, free flow and group yoga asana, individual all-around yoga asana championship, and team championship.

- Ministry of AYUSH added that the yoga asana as an Olympic event. This would spread the opportunity for expanding awareness of yoga and its myriad health benefits.

36. Augmenting India's Gas Infrastructure:

- Petroleum Ministry has announced a \$60 billion investment for creating gas infrastructure in the country till 2024 which is expected to increase gas share in India's energy mix to 15% by 2030.
- Currently, the country's gas share is 6% of the total energy mix.
- The \$60 billion would be spent towards developing infrastructures such as gas pipelines, LNG Terminals, and City Gas Distribution (CGD) networks.
- The Ministry also pointed out that it has started the nation's first automated national-level gas trading platform.
- The platform will see that share of gas in the country's energy mix will rise from 6.2% at present to 15% by 2030.
- The trading platform was unveiled in June 2020 to promote and sustain a robust gas market and foster gas trading in the country.
- According to the Ministry, CGD projects are being expanded to 232 geographical areas spread over 400 districts. This would cover 53% of the country's geography and 70% of the population.
- Announcing the gas infrastructure augmenting plan, the Ministry had also said that the government is adopting clean mobility solutions and is looking to use LNG (liquified natural gas) as a transportation fuel, including for trucking.
- The government has a plan to set up 1,000 LNG fuel stations across the country.

Petroleum Reserves:

- The Ministry stated that, in 2020, 5.33 million tonnes of petroleum had been stored in the reserves constructed at Visakhapatnam, Mangaluru and Padur.
- Also, the government is establishing another 6.5MT capacity commercial-cum-strategic reserve in a public-private-partnership mode at Chadikol and Padur.

37. The Himalayan Trillium:

- **The International Union for Conservation of Nature (IUCN) declared the Himalayan Trillium as an endangered species.**
- **The Himalayan Trillium is a common herb of the Himalayan region.**
- In the Himalayan region, the plant has become one of the most traded commercial plants.
- **The commercial trading of the plant is due to its medicinal values.**
- The herb has been used in traditional medical treatments such as **dysentery, wounds, skin boils, sepsis, inflammation, menstrual and sexual disorders.**
- Recent studies show that the **herb's rhizome is a source of steroidal saponins.**
- It can also be used in the **treatment of anti-cancer and anti-aging agents.**
- So this became an easy target for the poachers as there is huge market demand.
- **The Himalayan herb is found in the temperate and sub-alpine zone of the Himalayas.**
- It is found at an altitude from **2400-4000 metres above sea-level.**
- The herb is found across **India, Bhutan, Nepal, Afghanistan, China, and Pakistan.**

- In India, it is majorly found in four states - **Jammu and Kashmir, Himachal Pradesh, Sikkim and Uttarakhand.**
- Locally, the herb is known as **Nagchatri** and **grows to a height of 15-20 cm.**
- As there is an expectable demand for rhizomes of the herb, the population may decline to 50% between 2010 and 2079.
- **The threatening factors for the survival of the plant are overexploitation, long life cycle, slow to reach reproductive maturity, and poor capacity for seed dispersal.**
- The major causes of the decline are specific habitat requirements, high trade value and increasing market demand.
- In 2017, the herb was recorded as a medicinal plant that was traded from India.
- The herbs price was increased and sold at \$50-315 per kilogram.
- The illegal trade can be prevented by the implementation and enforcement of sustainable collection protocols and quotas.
- The best option to control the illegal trade is to designate the areas of natural habitat to local communities for management of harvest.
- The implantation of the **FairWild Standard** can help traders and concerned agencies in the sustainable harvest and trade of the species.
- Researchers also suggested that the educational efforts which include elevation of public awareness surrounding the threats of the species and best practices for the harvest.

Fair-Wild Standard:

- The **FairWild Standard is promoted by FairWild Foundation**, an international organisation that implements a system for sustainable and fair trading of wild herbs, their ingredients and products.
- FairWild Foundation was established in the year 2008 in light of the ecological damage being caused to wild plants and their ingredients which are being heavily used for food, cosmetics, medicines and well-being products.
- The Foundation also promotes **FairWild Certification system.**
- When a product has the certification, it means the consumer will know that they are supporting an ethical fair traded products and the proceeds of the trade will benefit the local communities that harvest the plants.

38. Potential Radio Signal from An Exoplanet:

- In an exciting discovery, a team of international scientists has for the first time detected radio signals coming possibly from an exoplanet beyond the solar system.
- The radio signals were emanating from an exoplanet system about 51 light-years away from Earth.
- The researchers made the discovery using **LOFAR, a lower frequency array radio telescope** from the Netherlands.
- The emissions were busted from the **Tau Bootes star system.**
- The Tau Bootes star system was hosting a Hot Jupiter which is a gaseous giant planet and is closer to its sun.
- The researchers were from Cornell University in the US.
- Scientists observed the exoplanetary potential radio-emission signals in the constellation Cancer and Upsilon Andromedae systems.
- This research showed that only the Tau Bootes exoplanet systems exhibited a significant radio signature.

- The signal contains a binary star system and an exoplanet.
- This new radio signal detection opens up a new window on exoplanets.
- It also provides a new way to examine alien worlds that are tens of light-years away.

Sources of Radio Signals:

- Astronomical radio waves are emitted from various types of objects in the Universe.
- These objects are extremely energetic physical processes of the Universe.

Some sources are:

1. Galactic centres
2. supernova remnants
3. Neutron Stars - Pulsars, Rotating Radio Transient (RRAT) sources
4. Radio galaxies
5. Quasars
6. Extragalactic pulses
7. Primordial blackholes
8. In our solar system, the Sun and the Jupiter are sources of radio waves.

39. Early Health Warning System:

- The Ministry of Earth Sciences (MoES) is developing a much needed **‘Early Health Warning System’ for the country.**
- The system is expected **to forecast the possibility of disease outbreaks in the country.**
- Currently, the model is under development stage.
- **The model is based on the relationship between weather changes and the incidence is expected to predict outbreaks of vector-borne diseases.**
- This system will monitor diseases like malaria, diarrhoea, and also non-communicable diseases.
- Weather pattern plays a crucial role in diseases like malaria where particular rainfall and temperature patterns can be predicted whether an area is likely to have an outbreak.
- Across geographical locations, changes in rainfall and temperature patterns play a major role in various disease outbreaks.
- Heat-related diseases and diseases like cholera can also be predicted with the system.
- **Researchers say that if such a system is developed, it would give ample time for authorities to prepare.**
- A detailed analysis was carried on malaria and diarrhoea in two districts of Maharashtra - Pune and Nagpur.
- This helped to verify the robustness of the advance warning system.
- The study showed that both the districts have incidences of both diseases.
- Nagpur reports a higher number of malaria cases and diarrhoea cases are high in Pune.
- The analysis showed that temporal and spatial variability in weather parameters.
- This showed that the short term increase in temperature and rainfall as an effect of El-Nino can lead to malaria epidemics.
- An Intergovernmental Panel on Climate Change in its 2007 report showed the climate change may increase the risk of diarrhoeal diseases.
- This is of major concern in developing countries with increasing incidents of floods and droughts.

- **The research was started with vector-borne diseases as there is a direct link to weather patterns.**

40. NFHS Report and Its Importance:

- The Ministry of Health and Family Welfare (MoHFW) had released the results of the first phase of the National Family and Health Survey (NFHS-5).
- The data for the first phase was collected in the second half of 2019.
- In the first phase, the survey was conducted in 17 states and 5 union territories.
- The most important takeaway is between 2015 and 2019.
- Reversal on several child malnutrition parameters was noticed in several Indian states.
- The second phase of the survey was disrupted by the COVID-19 pandemic and the results are expected to come in May 2021.
- The states which will be covered in the second phase are Uttar Pradesh, Madhya Pradesh, Punjab, and Jharkhand.
- Researchers say that the second phase survey on child malnutrition to be even worse.

What is NFHS?

- National Family Health Survey, NFHS is a large-scale nationwide survey of representative households and the data is collected over multiple rounds.
- The International Institute for Population Sciences in Mumbai designated the MoHFW as the nodal agency.
- The survey collaborates with the IIPS, ORC Macro, Maryland (US), and the East-West Centre, Hawaii (US).
- United States Agency for International Development (USAID) and UNICEF funded the Survey.
- The NFHS-5 refers to the period 2019-20.
- The first four were referred to 1992-93, 1998-99, 2005-06, 2015-16.

What data does it collect?

- The NFHS-5 factsheet provides state-wise data on 131 parameters.
- The parameters include questions such as how many households get drinking water, electricity and sanitation.
- It also includes questions such as what is the sex ratio at birth, what are infant and child mortality metrics, what is the status of maternal and child health, how many have high blood sugar or high blood pressure.
- Each round also expanded the scope of inquiry.
- Some new questions were also included in the survey such as questions on preschool education, disability, access to a toilet facility, bathing practices during menstruation, death registration, and methods and reasons for abortion.

Importance of NFHS:

- The NFHS database is the most important one as it feeds into the research needs and informs advocacy and also acts as a policymaker to both central and state.
- This survey result provides internationally comparable results.
- Thus, its results are placed in the global context. For example child malnutrition trends in Bihar.

What has NFHS-5 found?

- Researchers described the results as shocking, alarming and very troublesome.

- The number of states worsening over the last round under several parameters.
- The most troubling is the Child Malnutrition parameters like infant and child mortality- under 5 years of age, child stunting- low height for one's age, child wasting- low weight for one's height and proportion of underweight children where several states have either been stagnant or worsened.
- Children born between 2014 and 2019 are more malnourished than the previous generations.
- The reversal in the proportion of children who are stunted is the most worsen where stunting represents chronic malnutrition.
- Another cause of concern is that the first phase data is pre-pandemic and the second phase will also incorporate COVID's impact.

Importance of the Results:

- The child malnutrition and anaemia in women points to Indian children born in the past 5 years may suffer from both cognitive and physical deficiencies.
- India registered a significant reduction in child malnutrition between NFHS-3 (2005-06) and NFHS-4 (2015-16).
- This was possible due to the interventions such as nutrition missions, Integrated Child Development Services, the introduction of MGNREGA and the expansion of Public Distribution Systems.
- But, the latest results show that India's gains were reversed since 2015 despite improvements in clean drinking water availability and sanitation methods.
- These results show a complex set of reasons ranging from the state of the family's income generation to environmental factors to government interventions.

41. Regulating Private Hospitals Through A Law Mooted:

- In a report submitted to the Rajya Sabha Chairman, the Parliamentary Committee on Home Affairs called for a comprehensive public health act with proper legal provisions to keep activities of private hospitals under check during pandemic times.
- The law must also curb black marketing of medicines.
- Several instances of private hospitals selling beds that are reserved for COVID-19 patients at exorbitant prices have been reported.
- Noting these malpractices by private hospitals, the committee has recommended a Public Health Act at the national level to restrain private hospitals from profiteering during emergencies like the pandemics.
- The Committee also pointed that the Act must also check black marketing and product standardisation.
- It also suggested that the Government must hold awareness campaigns on cheaper and effective re-purpose medicines to refrain people from spending huge amounts on expensive drugs.
- The committee also noted that during the initial phase of the COVID-19 pandemic, insurance was not extended to COVID patients, which resulted in patients suffering due to exorbitant costs charged by private hospitals.
- To restrict this, the committee recommended for a regulatory oversight on hospitals and prevent them from refusing insurance claims.
- Further, it noted that the target should be to make treatment cashless for COVID 19 patients with an insurance cover.

- The committee appreciated the work of National Disaster Management Authority (NDMA) which had come out with Standard Operating Procedures (SOPs), awareness generation campaigns, and acted as a nodal agency for funding manpower deployment to meet exigences.
- Noting that the NDMA had handled the pandemic unlike any other natural disaster, the committee had recommended a separate wing to be formed within NDMA that will handle/manage pandemics in the future.
- This special wing may take the role of building partnerships between government and the corporates, public sector and NGOs and others.
- During the pandemic, the government has tried to alleviate the pandemic's impact on the economy, the committee noted that several schemes have not been implemented properly.
- It pointed out that problems are being faced by farmers, non-corporates, non-farm small/micro businesses in getting loans.

On Migrant Labourers:

- The committee stated that the migrants were the worst hit due to the pandemic.
- Lack of information and poor dissemination of information about food, shelter and other amenities, migrants labourers and workers had moved en masse to their home states.
- The committee recommended drawing up a national plan and guidelines under NDMA, 2005 and Epidemics Diseases Act 1897 for proper coordination between district authorities, states, UTs and the centre in the future.
- It also noted that locating and disbursing relief measures to migrants has also become a problem during the pandemic due to lack of a database on migrants.
- Thus, the committee recommended a national database on migrant workers which will help identify them and deliver ration and other benefits.
- It called for including details like source destination, earlier employment details, and nature of their skills.

42. A Massive Increase in Leopard Numbers in the Country:

- There are an estimated **12,852 leopards in the Indian forests.**
- Of these, 3421 are in Madhya Pradesh, 1783 in Karnataka and 1690 in Maharashtra.
- The previous estimate of these big cats was 7910 and was conducted in 2014.
- Compared with 2014, more than **60% increase in population has been recorded.**
- Releasing the report, the Environment Minister has pointed that the increase in tiger, lion and leopard populations shows that the conservation efforts are yielding results.
- It also shows how India is taking care of its environment, ecology and biodiversity.

Distribution:

- The report shows that Central and Eastern Ghats have the highest leopard numbers at 8071.
- The western ghats region has 3387 leopards, the Shiwaliks and Gangetic plains combined consists of 1253 leopards.
- In the Northeastern Hill ranges, there are only 141 leopards.
- The study was conducted by the Wildlife Institute of India and the National Tiger Conservation Authority (NTCA).
- Camera traps, satellite imaging, field work by forest officers' teams were used for the survey.

- While the increase in leopards numbers is a good sign, conservationists caution that over the last 100-125 years leopard habitats have been shrinking and there is an increased risk of man-animal conflict.
- The study was carried out only in the tiger-populated forests under Project Tiger, and leopard populations in agricultural, non-forested areas like tea and coffee plantations.
- Most parts of the Northeast have not been surveyed.
- The threats to the leopard in India are poaching, habitat loss, depletion of natural prey and human-animal conflict.
- Fragmentation of forests and increased human-leopard conflict are major threats.
- When forests get fragmented, leopards venture closer to human settlements, this is when conflict arises.
- While development cannot be stopped, green technologies can be deployed to increase forest cover and protect the species.

43. 'Two-Child Policy Not Needed':

- The data from the **National Family Health Survey-5 (NFHS-5)** shows **evidence of the use of modern contraceptives in rural and urban areas.**
- This improvement declined the average number of children borne by a woman.
- This shows that the country's population is stabilizing and fear of population explosion is unwarranted which had misguided the government's over two-child policy.
- NITI Aayog called various stakeholders for a national-level consultation on the issue of the two-child policy.
- The first part of the NFHS-5 report records data for 17 states and 5 union territories.

Data Analysis:

- The analysis done by the international non-profit **Population Council (PC)** shows that the **Total Fertility Rate (TFR) has decreased across 14 out of 17 states.**
- The **number of children born per woman is either at 2.1 children per woman or less.**
- Most states have attained **replacement level fertility.**
- **This implies the average number of children born per woman at which a population exactly replaces itself from one generation to the next.**
- There was a decline in the use of modern methods of contraception during NFHS-3 and NFHS-4.
- The modern contraception methods include oral pills, condoms, intra-uterine device.
- In NFHS-5, in 11 out of 12 states there was an increase in modern contraception use.

44. Govt Mulling to Set Up Development Finance Institute:

- In the next 3 to 4 months, the government plans to setup Development Finance Institute (DFI).
- According to the Financial Services Secretary, for funding the national infrastructure pipeline Rs 111 lakh crore is required.
- Infra financing needs patient capital and banks are not suited for lending long-term projects so there is a need for a DFI.
- **DFI will help to have a robust bond market for infrastructure financing.**
- DFI is needed to provide funding and to enhance the credit rating of projects.

- The DFI will act as a catalyst and would fund projects where others are not willing to enter due to the risks.
- Finance Minister proposed to set up DFIs for promoting the infrastructure funding.
- **Under the National Infrastructure Pipeline, 7000 projects have been identified for the period 2020-2025.**
- The DFI would have a key role apart from financing role.
- India had DFIs engaged in the development of industry, ICICI and IDBI in the past.
- The country's oldest financial institutions that acted as DFI was IFCI Ltd.

National Infrastructure Pipeline:

- The National Infrastructure Pipeline (NIP) is a first of its kind initiative where for the FY 2019-25 the government will undertake infrastructure building to provide world-class infrastructure to the citizens.
- Energy, roads, railways, and urban projects attract the bulk of the investments.
- In implementing the projects, the central and state governments will have an equal share of 39% each while the private sector will have a 22% share.
- Setting up of DFIs is a part of the NIP to finance and monetize infrastructure assets.
- The real-time data on the projects related to NIP are made available on the India Investment Grid website.
- The website also aids investors, lenders, and companies that are bidding for work by providing detailed information on NIP projects.

45. SKAO - World's Largest Telescope:

- After the United Kingdom ratified the international treaty Convention, there was a nod to establish the **Square Kilometre Array Observatory (SKAO)**.
- **SKAO is proposed to be the world's largest radio telescope.**
- It will be **built across two continents Africa and Australia and will have the global headquarters in the UK.**
- **SKAO is a collection of telescopes known as an array and would be installed in Australia and South Africa.**
- This project was awaiting ratification by five of its member-countries including three host countries the UK, South Africa and Australia.
- The UK ratified the treaty Convention on December 16 which is an international treaty organization and can now set up, build and run the SKAO over a lifetime.
- **Australia, South Africa, Italy, the Netherlands and Portugal had given the approvals to join the new treaty organization.**
- India is also involved in this project.
- The **Department of Atomic Energy (DAE)** is the official representative along with 20 scientific institutes.
- But India as a member country is yet to complete the final approval and ratification process to join the project.
- **This project will help to improve scientific knowledge and seek answers to the fundamental and poorly explored aspects of the Universe.**
- The project will help to explore the early history of the Universe, evolution of galaxies over cosmic time, fundamental physics in extreme environments, etc.
- The SKAO design work started in 2014 and took 6 years to complete with the contribution of 1000 engineers and scientists across 20 countries.

- **The team from India designed the sophisticated Telescope Manager system.**
- India has been assigned to lead the construction of the TM system.
- **TM system is responsible for the complete end-to-end operations of SKAO.**
- A SKAO council will be set up and the first meeting is expected to be held in January or in February of 2021.
- The major institutions along with NCRA were Raman Research Institute, Indian Institute of Science, IIT from Kanpur, Indore, Kharagpur, Inter University Centre for Astronomy and Physics, Tata Institute of Fundamental Research, Presidency College and IISER Mohali.
- **India is participating at a level that is close to 6% of the total SKA budget.**
- Countries like Italy, China, Spain, Germany, France, Canada are at various stages of getting their governmental approvals.
- The schedule of building SKAO is divided into two phases and the cost for the initial phase is about 1.8 billion Euros and for a period of 10 years.

46. Post-Matric Scholarship for SC Students Revised:

- The Cabinet Committee on Economic Affairs had approved changes to the Post Matric Scholarship for students from Scheduled Castes.
- The changes are expected to benefit 4 crore SC students in the next five years in completing their higher education successfully.
- One of the changes is the change in share pattern for the scheme. Now, the Central government will provide 60% and the State government will provide 40%.
- Till now, annually, Rs. 1100 crore, an average of three years is being spent on the scheme. With the new changes, the funding will increase five-fold.
- Between 2017-18 and 2019-20, the Central government's assistance was Rs. 1100 crore.
- Now, the central government's assistance would be Rs. 6000 crore during 2020-21 and 2025-26 period.
- Under the revised scheme, the total investment will be Rs. 59,048 crore, of which, the center will spend Rs. 35534 crore.
- Under the scheme, the government provides financial assistance to SC students, whose family's annual income should not exceed Rs. 2.5 lakhs.
- The scholarship will be for higher education at post-matriculation and post-senior-secondary stages.
- The aim of the changes is to increase the General Enrolment Ratio in higher education of scheduled castes and they would reach the national standards in the next 5 years.
- Also, the government is aiming to bring back SC students who dropped out of the education system due to financial challenges.
- Thus, the government will launch a campaign to bring back the SC students.
- There are an estimated 1.5 crore poorest SC students who dropped out of education after 10th and will be brought back to the higher education system in the next five years.
- States will undertake fool-proof verification of the eligibility and caste status, Aadhar identification and bank account details of each student.
- An online portal with robust cybersecurity will be in place for the purpose of registration to the scheme.

- One of the major changes brought is students will now receive financial assistance through Direct Beneficiary Transfer Mode.

47. Eastern Ghats is Home to A New Species of Plant:

- The new sun rose has been **discovered in the Prakasam district of Andhra Pradesh.**
- The plant has unique features - roots are tuberous, the flower is reddish-pink in color, fruits are prolate-shaped, seeds are copper brown in color, and there is no hair in its leaf axils.
- These features distinguish the new species from other species of the genus *Portulaca*.
- Botanists took an exploration of the Prakasam district between 2018 and 2020.
- The new species was first spotted in 2018 and were seen flowering in July-August.
- The flowers of the species are very minute in size, 0.5mm.
- It was found growing in rocky crevices at an altitude of about 1800 meters above sea level, very close to the ground, at about less than 10 cm.
- The flower blooming period for the plant is between June and February.
- Botanists who took part in the exploration (from Venkateswara University, Tirupathi) say that the species has rich horticultural value. They have grown the plant in their college botanical garden as part of ex situ conservation.
- They found that the plant can bear flowers for eight months.
- It is because of the succulent nature of the tuberous roots that the plant can grow even on rocky crevices.
- *Portulaca* genus plants are classified as Sun Rose because they flower in bright sunshine.
- Linnaeus was the first botanist to describe *Portulaca* as a genus of the flowering plant family *Portulacaceae*.
- Presently, there are over 100 taxa and are distributed throughout tropical and sub-tropical regions of the world.
- Earlier studies in India revealed the presence of eight species of *Portulaca* in the country.
- *Portulaca* genus plants show varying degrees of succulence in their vegetative parts like roots, leaves, and stems.
- For example, *Portulaca oleracea* is entirely succulent, whereas *Portulaca tuberosa* has the highest succulence in its roots.
- *Portulaca* species are found both in forests and agricultural fields, but ***Portulaca Lajii*, the new species, grows only in rocky crevices.**
- **The new species has been placed under the ‘Data Deficient’ category of the IUCN List of Threatened Species as little data about the population of the species is available.**

48. Nanomicelles: A Perfect Drug Delivery Carrier for Cancer Treatment:

- Nanomicelles are small structures similar to nanoshells and nanovesicles. They are an emerging platform in targeted therapy.
- Nanomicelles are globe-like structures.
- The outer shell is hydrophilic and the interior is hydrophobic. This dual property makes nanomicelles the perfect carrier for drug delivery.

For Cancer Treatment:

- Now, nanomicelles are being used for cancer treatment.

- A team of researchers has been using nanomicelles to deliver the drug docetaxel, a commonly used drug to treat cancers such as breast, colon and lung cancer.
- The goal of cancer therapy is to destroy cancer cells without damaging healthy cells.
- Chemotherapeutics for cancer treatment are highly toxic.
- Docetaxel being a hydrophobic drug is dissolved in a chemical mixture (polysorbate-80 and alcohol) which aggravates its toxicity. It affects the liver, lungs, and blood cells.
- Here lies the importance of nanomicelles as efficient drug carriers.

What is Cancer?

- Cancer is a group of more than 100 different diseases. It can develop almost anywhere in the human body.
- Cells are the basic units that make up the human body. Cells grow and divide to make new cells as the body needs them. Usually, cells die when they get too old or damaged. Then, new cells take their place.
- Cancer begins when genetic changes interfere with this orderly process. Cells start to grow uncontrollably. These cells may form a mass called a tumor. A tumor can be cancerous or benign.
- A cancerous tumor is malignant, meaning it can grow and spread to other parts of the body. A benign tumor means the tumor can grow but will not spread.
- As a cancerous tumor grows, the bloodstream or lymphatic system may carry cancer cells to other parts of the body. During this process, the cancer cells grow and may develop into new tumors. This is known as metastasis.
- Some types of cancer do not form a tumor. These include leukemias, most types of lymphoma, and myeloma.

The Mechanism:

- Nanomicelles are around 100nm in size.
- They are stable at room temperature.
- When injected intravenously, nanomicelles escape the circulation and reach the solid tumors where the blood vessels are leaky. In healthy organs, the leaky blood vessels are absent.
- Due to chemical conjugation, the phospholipid docetaxel prodrug remains silent in the circulation.
- But in the cancer cells, the enzymes will cleave the bond, the drug gets activated and the cancer cells are killed.
- The effectiveness of the nanomicelles has been tested on mice with breast tumor model.
- Tumor regression is found in the model and toxicity is very less compared to the currently used FDA-approved drug formulation.
- Further promising results were found in higher organisms like rats, rabbits and rhesus monkeys.

Mode of Action:

- Nanomicelles work by enhancing the expression of tumor suppressor genes.
- The team is now working on developing a nanomicelle that can carry multiple drugs for increasing the treatment effectiveness of individual drugs.
- According to the team, nanomicelles are extremely cost-effective and will become the next generation chemotherapeutic.

- The team working on nanomicelles is Indian which earlier has developed a hydrogel drug delivery system to carry a three-drug combination for cancer treatment. Compared to the hydrogel mechanism, the team bets big on nanomicelles.

Page | 51 **49. A Financial Innovation to Capitalise PSBs:**

- Financial innovation in the form of issuing zero-coupon bonds (non-interest bearing bonds) to PSBs is being carried out by the Central Government.
- The govt has issued Rs. 5,500 crores worth of these bonds to Punjab & Sind Bank valued at par.
- These bonds are a variation of recapitalisation bonds issued to PSBs earlier.

How Do These Bonds Work?

- The subscriber to these bonds does not need to pay any interest.
- They are not tradable and the bank can place them under the HTM bucket without requiring it to book on any mark-to-market gain or losses.
- Teeming these bonds as a great innovation and a financial illusion, market experts say that these bonds are an innovative way to capitalise banks and not affect the fiscal deficit while infusing equity to the banks.
- Further, they state that through the innovation the government is creating an impact worth Rs. 200 in the economy by using Rs. 100.
- But, they also caution that these bonds may not be a permanent solution to the banking sector's problems.

The Innovation:

- The recapitalisation bonds that were used earlier carried interest and were sold to different banks.
- But, the Zero Coupon Bonds innovated by the government bear no interest, and are non-transferrable.
- They have a maturity of 10-15 years.
- These bonds can be held at the held-to-maturity (HTM) category of the bank as per RBI guidelines, thereby these bonds can be accounted for at face value and no mark-to-market will be there.
- The government had issued these bonds specifically for the Punjab & Sind Bank.
- The MD and CEO of the bank Mr. S Krishnan said that the government followed due diligence in issuing the bonds at par.
- These Zero Coupon bonds are different from regular zero coupon bonds.
- The regular ones though have no interest, but comes with a discount which technically amounts to interest-bearing.
- The amount of the new bonds will be paid on maturity.
- As per a Finance Ministry official, the accounting of these bonds is at par, but what matters the most with the instrument is its net present value.
- The government had notified these bonds on December 11.

How the Bonds are Different from Those Issued by Private Firms?

- Zero bonds issued by private firms are issued at discount. These special bonds are issued at par.

- The special bond in the case of Punjab & Sind Bank is being issued at Rs. 5,500 crores which will mature in tranches between 2030 and 2035. The worth of these bonds at that time would be Rs. 2750 crores.
- The government will infuse equity worth Rs.5,500 crores into the bank instead of Rs. 2,750 crore.
- The specialised bond is a financial illusion by the government which will buy some time to put the house in order but is not a permanent solution to the problems faced by the banking sector.

50. Western Ghats Throws Up A New Species of Muraingrass:

- Indian Muraingrass is a high economic value species as it is commonly used as cattle fodder.
- The new species is named *Ischaemum janarthanamii*.
- Belonging to the Ischaemum family, the new species was identified after carrying out morphological studies of laterite samples collected from the outskirts of Goa's Bhagwan Mahavir National Park.
- The name janarthanamii of the new species is in honor of senior professor M K Janarthanam at Goa University. He contributed immensely for documenting Goa's floristic diversity and Indian grass taxonomy.

Harsh Conditions:

- The species has survived the harsh conditions of the ecologically-sensitive Western Ghats.
- It has survived climatic conditions like extreme heat, desiccation and is growing in nutrition poor soil.
- As per researchers, despite the harsh conditions, the species blooms every monsoon season.

The Study:

- Researchers from ARO studied the samples for three years before confirming their finding to be a new species.
- Their research helped in understanding the characteristics of Muraingrass in-detail.
- Of the 85 known Ischaemum species in the world, India is home to 61 species.
- Approximately 40 species are found in the Western Ghats alone.

51. 'Digital Ocean' Launched:

- The Minister of Earth Sciences, Science and TEchnology has launched the first of its kind digital platform for ocean data management called the Digital Ocean.
- The platform is developed by INCOIS (Indian National Centre for Oceanic Information Services).
- It is a one-stop solution for all data related needs.
- A wide range of users can access the data. They include research institutions, strategic users, operational agencies, maritime industry, academic community and general public.
- According to INCOIS, Digital Ocean will bring a change in how oceanographic data is used for understanding oceans.
- The platform will help in sustainable management of oceans and expanding Blue Economy Initiatives.

- Digital Ocean has a set of applications that present heterogeneous oceanographic data with geospatial technology.
- Some of the applications are interactive web-based environment for data integration 3D and 4D data visualisations.
- Assesses the evolution of oceanographic features obtained from multiple sources like on site monitoring devices, remote sensing and model data.

INCOIS:

- INCOIS has been the premier organisation for providing ocean information and advisory services to various stakeholders in the country.
- The advisory services are:
 1. potential Fishing Zone (PFZ) advisories
 2. Ocean State Forecast (OSF)
 3. high wave alerts, tsunami early warnings
 4. storm surge
 5. oil-spill advisories
- INCOIS is also serving as the National Argo Data Centre and Regional Argo Data Centre of the International Argo Programme.

52. A Conservation Plan for Kolar Bats:

- **The Kolar Leaf-nosed bat is found only in two caves of the Hanumanahalli village in Kolar District of Karnataka.**
- For some unknown reasons, bats in one cave have gone locally extinct.
- Now, the Karnataka Forest Department and **Bat Conservation India Trust (BCIT)** are working on a conservation plan on a war footing to save the bat species from getting extinct.
- BCIT is drawing up the conservation plan and a grant has been awarded to conduct research on the bat species.
- The funding has been provided by the **Habitats Trust.**
- The State Government came to know about the extinction of the bats in one cave when a research was conducted by Osmania University in 2014.
- Then, the government had immediately notified the 30 acres around the caves as a protected area.
- **Kolar Leaf-Nosed Bat is an endemic species.**
- Very little is known about the species - its diet, ecology, behaviour, and what would be the impact on the bats if the cropping pattern changes in the region.
- In India, there are 130 species of bats, yet we know little about these mammals.
- Bats are very adaptable creatures. Hence they are not shy of living close to human habitations with many are found even in urban settlements, which makes them vulnerable.
- Due to some recent incidents, bats have gained a bad reputation as carriers of diseases.
- **But, bats are absolutely crucial for the ecology as they are pollinators, their main diet being nectar.**
- Plants that bloom at night are predominantly dependent on bats and moths for pollination.
- Bats also act as **protectors of crops as they help in insect control.**

- In the caves of Hanumanahalli, there are three to five species of bats of which leaf-nosed is one. As per current estimates, there are only 150 Kolar Leaf-Nosed Bats left in the caves.

Ecological Roles of Bats:

- The ecological roles of bats include pollinating and dispersing the seeds of hundreds of species of plants. For example, bats serve as major pollinators of many types of cacti that open their flowers only at night, when bats are active.
- For example, bats serve as essential pollinators for various types of commercially valuable crops, including bananas, mangos and guavas.
- In addition, bats eat copious quantities of insects and other arthropods. On a typical night, a bat consumes the equivalent of its own body weight in these creatures.

53. EU bans plastic waste exports to Poor Nations:

- The European Commission has banned the export of all hazardous and non-recyclable plastic waste to developing countries outside the Organization of Economic Cooperation and Development (OECD), with effect from **January 1**.
- Non-OECD nations could be sent clean, non-hazardous waste exports for recycling under very strict conditions.
- The rule change was a key part of the EU's Green Deal effort to establish a circular economy.

Prompted by 1989 convention:

- The new rules will also govern plastics shipments within the 27-member EU and stem from a May 2019 conference decision binding most signatory nations of the so-called 1989 Basel Convention.
- The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, (known as the Basel Convention) is an international treaty that was designed to reduce the movements of hazardous waste between nations, and specifically to prevent transfer of hazardous waste from developed to less developed countries (LDCs).
- As a bloc, the European Union ratified the convention in 1994.

European Commission:

- The European Commission (EC) is the executive branch of the European Union.
- It is responsible for proposing legislation, implementing decisions, upholding the EU treaties and managing the day-to-day business of the EU.

Organisation for Economic Cooperation and Development:

- The OECD is an intergovernmental economic organisation, founded to stimulate economic progress and world trade.
- Most OECD members are high-income economies with a very high Human Development Index (HDI) and are regarded as developed countries.
- Founded: 30 September 1961
- Headquarters: Paris, France
- Total Members: 37
- India is not a member, but a key economic partner.

Reports and Indices by OECD

1. Government at a Glance 2017 report.
2. International Migration Outlook.

3. OECD Better Life Index.

Why India is not ready to join the OECD?

- India has decided against becoming a member of the Organisation for Economic Cooperation and Development (OECD) for now, but it is talking to the Paris-based body for expanding sectoral engagement.
- The OECD is primarily a group for developed countries. India is developing, not developed.
- The OECD was around long before India's growth began and has been the hallmark for numerous international tax standards.
- OECD also has a criterion for giving membership, which has been relaxed a few times on earlier occasions to include some emerging nations. For instance, India's per capita income is lower than the OECD limit for its members, but the organisation has eased this criterion before for some other members.
- If India decided to join it as a member, it will have to accede to the organisation's demands and standards and make certain commitments. A country needs a good amount of human resources to become a member of OECD.
- The organisation has several areas, committees, documents rules, procedures which a member country has to sign up.
- Currently, India collaborates with OECD on about 30 committees in areas such as taxation, transport research, chemical, pesticides, biotechnology, consumer policy, statistics, fiscal policy, steel and private pension.

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