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ESE-2021
(Preliminary Examination)

Current Issues

(October - 2021)

ACE is the leading institute for coaching in ESE, GATE & PSUs

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19 All India 1st Ranks in ESE

62 All India 1st Ranks in GATE

Current Issues
(October - 2021)

POLITY OF GOVERANCE

2ND PHASE OF SBM-U

Why in News

Recently, the Prime Minister launched the second phase of Swachh Bharat Mission-Urban (SBM-U 2.0).

- The Ministry of Housing and Urban Affairs (MoHUA) is the nodal ministry for the scheme.

KEY POINTS

About:

- SBM-U 2.0, announced in Budget 2021-22, is the continuation of SBM-U first phase. The government   is trying to tap safe containment, transportation, disposal of faecal sludge, and septage from toilets.
- SBM-U first phase was launched on 2nd October 2014 aiming at making urban India Open Defecation Free (ODF) and achieving 100% scientific management of municipal solid waste. It lasted till October 2019.
- It will be implemented over five years from 2021 to 2026 with an outlay of Rs.1.41 lakh crore

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ACE X DEEP LEARN

Aim:

- It focuses on source segregation of garbage, reduction in single-use plastic and air pollution, by effectively managing waste from construction and demolition activities and bioremediation of all legacy dump sites.

- Under this mission, all wastewater will be treated properly before it is discharged into water bodies, and the government is trying to make maximum reuse a priority.

Mission outcomes:

- All statutory towns will become ODF+ certified (focuses on toilets with water, maintenance and hygiene)

- All statutory towns with less than 1 lakh population will become ODF++ certified (focuses on toilets with sludge and septage management).

- 50% of all statutory towns with less than 1 lakh population will become Water+ certified (aims to sustain toilets by treating and reuse of water).

- All statutory towns will be at least 3-star Garbage Free rated as per MoHUA's Star Rating Protocol for Garbage Free cities.

- Bioremediation of all legacy dumpsites.

Progress under SBM-U Phase-I:

- 4,324 urban local bodies have been declared Open Defecation Free, which has been made possible through the construction of more than 66 lakhs individual household toilets and over 6 lakhs community/ public toilets, far exceeding the Mission's targets.

- Digital enablements such as Swachhata App, the digital grievance redressal platform introduced by

- MoHUA in 2016, has reinvented the way in which citizen grievance redressal is managed.

- Swachh Survekshan, the world's largest urban cleanliness survey covering over 4,000 Urban Local

- Bodies was initiated under SBM-Urban in 2016.

DIGISAKSHAM PROGRAMME

Why in News

Recently, the Union Labour Ministry and Microsoft India have jointly launched a digital skilled platform -- DigiSaksham -- to enhance youth employability.

- This joint initiative is an extension of the ongoing programs to support the youth from rural and semiurban areas.

DigiSaksham

A Digital Skill initiative to enhance employability of youth

Key features of DIGISAKSHAM

A Digital Skill programme launched by Ministry of Labour & Employment in collaboration with Microsoft India.

To enhance the employability of youth belonging to rural & semi-urban areas of the country, by imparting digital skills required in this technology driven era.

KEY POINTS

About:

- Free of cost training in digital skills including basic skills as well as advanced computing, will be provided to more than 3 lakh youths in the first year.
- Priority will be given to the job-seekers of semi urban areas belonging to disadvantaged communities, including those who have lost their jobs due to Covid-19 pandemic.
- Training would be conducted at the Model Career Centres (MCCs) and National Career Service Centres (NCSC) for Scheduled Castes (SCs)/Scheduled Tribes (STs) across the country.
- Implemented by: Aga Khan Rural Support Programme India (AKRSP-I).

- AKJRSP-I is a non-denominational, nongovernment development organization. It works as a catalyst for the betterment of rural communities by providing direct support to local communities.

- **Role of NCS Portal:** The Job Seekers can access the training through National Career Service (NCS) Portal.

- NCS Portal is a one-stop solution that provides a wide array of employment and career related services to the citizens of India. It is implemented by the Ministry of Labour and Employment.

Need:

- To bridge the gap of India's digital divide, placing the country on the path to inclusive economic recovery and preparing India's talent to thrive in a digital future catering not only to the needs of the domestic economy but also to tap the overseas employment opportunities.

PM'S 60-POINT ACTION PLAN

Why in News

Recently, the Centre has prepared a comprehensive 60-point action plan.

- The action plan is targeted at specific ministries and departments, but a closer analysis suggests they fall under broadly three buckets: leveraging IT and technology for governance, improving business climate, and upgrading the civil services.

KEY POINTS

Leveraging IT and Technology for Governance:

- There are several actionable inputs for the Ministry of Electronics and Information Technology from streamlining disbursement of scholarships to bridging digital divide for underprivileged students by developing indigenous tablets and laptops.

- Digitising all land records by 2023 under the central database called 'Matribhumi.' Integration with the e-Courts system will provide transparency on title/ possession related issues.

- Citizenship may be linked to birth certificates through technology and mainstreamed.

KRISHI UDAN 2.0

Why in News

Recently, the Union Minister of Civil Aviation has released Krishi Ude Desh Ka Aam Naagrik (UDAN) 2.0 to facilitate movement of agricultural produce by air.

- It lays out the vision of improving value realization through better integration and optimization of agriharvesting and air transportation and contributing to agri-value chain sustainability and resilience under different and dynamic conditions.

- Earlier, ahead of UDAN Day (21st October), the Ministry of Civil Aviation flagged off 6 routes, expanding the aerial connectivity of North-East India, under the UDAN Scheme.

KEY POINTS

About:

- Krishi UDAN was launched in August 2020, on international and national routes to assist farmers in transporting agricultural products so that it improves their value realisation.

- Krishi UDAN 2.0 will focus on transporting perishable food products from the hilly areas, northeastern states and tribal areas.

- It will be implemented at 53 airports across the country mainly focusing on northeast and tribal regions and is likely to benefit farmers, freight forwarders and airlines.
  - ✓ Opted airports not only provide access to regional domestic markets but also connect them to international gateways of the country.

NATIONAL STEERING COMMITTEE: NIPUN BHARAT MISSION

Why in News

Recently, a National Steering Committee (NSC) has been formed for the implementation of NIPUN Bharat Mission.

- NIPUN (National Initiative for Proficiency in Reading with Understanding and Numeracy) Bharat Scheme was launched earlier this year as part of the National Education Policy (NEP) 2020.

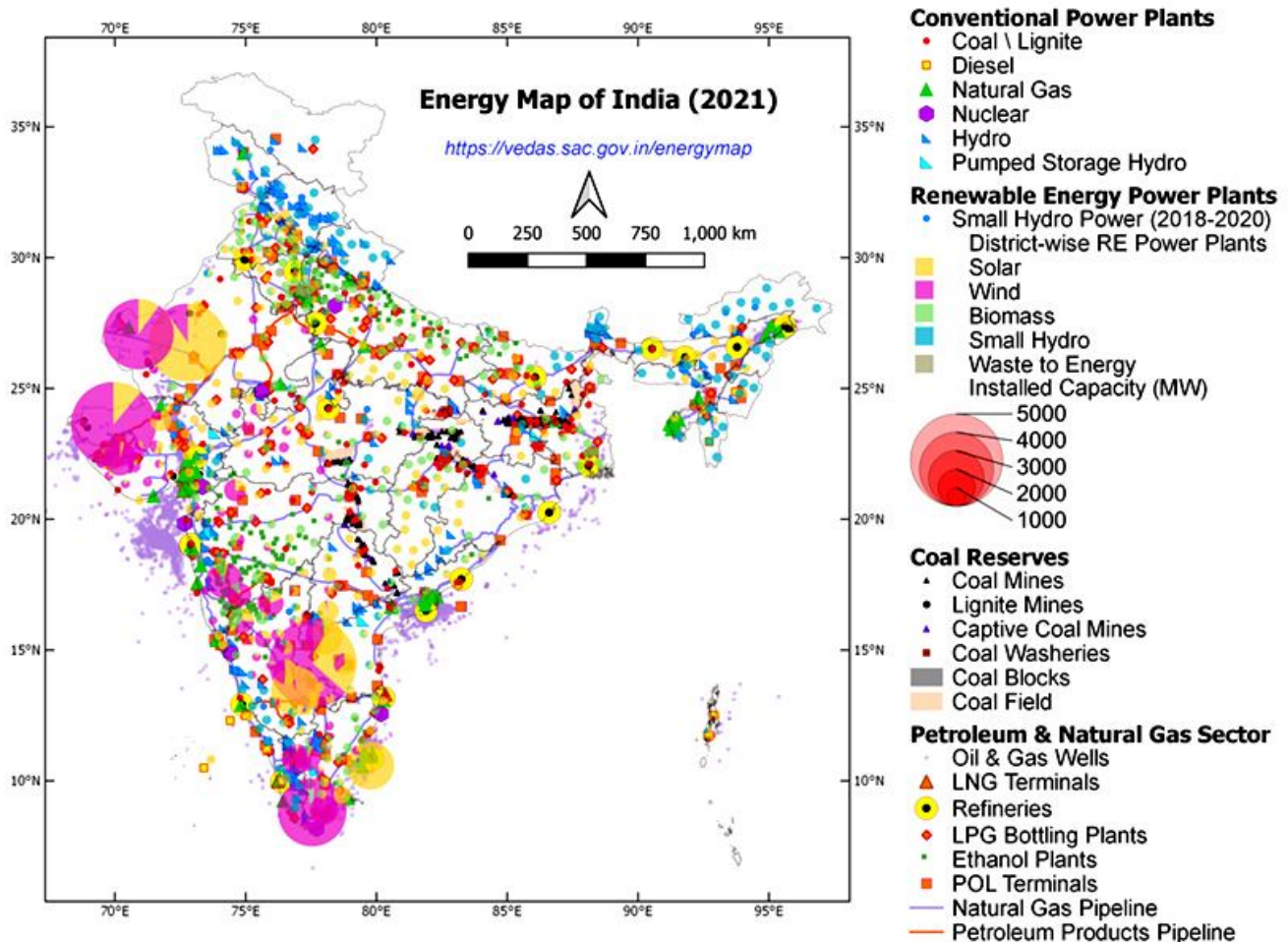

KEY POINTS

Roles and Responsibilities of NSC:

- To oversee the progress of the National Mission on Foundational Literacy and Numeracy and provide guidance on policy issues.
- To arrive at the target to be achieved nationally in 2026-27.
- To disseminate tools for measurement of yearly progress in the form of guidelines.
- To prepare and approve a National Action Plan (based on the State's Action Plans).
- To review programmatic and financial norms periodically to ensure they are synchronised with targets to be achieved.

GEOSPATIAL ENERGY MAP OF INDIA

Why in News

Recently, NITI Aayog launched a comprehensive Geographic Information System (GIS)-based Geospatial Energy Map of India.

- Earlier in July 2021, the Association of Geospatial Industries released a report titled "Potential of Geospatial Technologies for the Water Sector in India''.

KEY POINTS

About:

- It is developed by the NITI Aayog in collaboration with Indian Space Research Organisation (ISRO) with the support of Energy Ministries.
- It provides a holistic picture of all energy resources of the country.

- It enables visualisation of energy installations such as conventional power plants, oil and gas wells, petroleum refineries, coal fields and coal blocks, district-wise data on renewable energy power plants and renewable energy resource potential through 27 thematic layers.

MYPORTAPP

- On 8 October 2021, Sarbanand Sonowal, the union minister for Ports. Shipping and Waterways launched a port mobile application called MyPortApp in Kolkata.
- The App includes all port details digitally and monitors operations virtually.
- The App is aimed to promote transparency and easy access to port-related information. The app provides infor-mation like Vessel Berthing, Rake & Indent, Rake Receipt, Container Status, Tariff, Bills, Port Holidays, etc. and can be accessed anywhere 24x7 and reach out directly to the port.

INTERNATIONAL ISSUES

CICA 6TH FOREIGN MINISTERS MEETING

Why in News

Recently, the External Affairs Minister addressed the 6th Ministerial (2021) meeting of the Conference on Interaction and Confidence-Building Measures (CICA) in Nur-Sultan, Kazakhstan.

- Last year, Kazakhstan assumed the chairmanship of CICA.
- The 5th Meeting of the Ministers of Foreign Affairs of the CICA was held in Beijing in the year 2016.

KEY POINTS

On Vaccine Maitri:

- India's internationalism (Vasudhaiva Kutumbakam) drives its Vaccine Maitri.
- In January 2021, India launched the Vaccine Maitri (Vaccine Friendship) initiative – a major diplomatic effort to gift and supply made-in-India vaccines to low-income and developing countries globally.

On Cross Border Terrorism:

- Advised the forum to strengthen collective resolve to tackle terrorism, arms trafficking, narcotics trade, and other forms of trans-national crimes.

On Multilateralism:

- Asia especially, but also Africa and Latin America, are inadequately represented in United Nations' (UN) decision-making.
- The limitations of the multilateral response to the Covid pandemic were starkly evident. This only makes a case for reformed multilateralism more urgent with each passing day.

On Afghanistan:

- India underscored the importance of the Taliban regime meeting the expectations of the international community as elaborated in the UN Security Council Resolution 2593.
  - ✓ The UNSC resolution 2593 unequivocally demands that Afghan territory not be used for sheltering, training, planning or financing terrorist acts; and specifically refers to terrorist individuals proscribed by the UN Security Council, including Lashkar-e-Taiba and Jaishe-Mohammad.

On Connectivity:

- Connectivity must respect the most basic principle of international relations-respect for sovereignty and territorial integrity.
- An apparent reference to India's objection to China's ambitious infrastructure development plans in Pakistan under the China-Pakistan Economic Corridor (CPEC).
  - ✓ CPEC, which connects Gwadar Port in Balochistan with China's Xinjiang province, is the flagship project of Chinese President Xi Jinping's ambitious Belt and Road Initiative (BRI).
  - ✓ India has protested to China over the CPEC as it is being laid through PoK.

About CICA

- The CICA is an intergovernmental forum aimed at strengthening regional cooperation and ensuring peace, security, and stability in Asia.
- The idea of creating the organization was first voiced by Kazakhstan's First President Nursultan Nazarbayev in 1992 at the 47th session of the United Nations General Assembly, while the first CICA summit was held in June of 2002.

- The highest decision making organ of CICA is the Meeting of the CICA Heads of State and Government (Summit). The CICA Summit is convened every four years in order to conduct consultations, review the progress of, and set priorities for CICA activities.
- The Meeting of the Ministers of Foreign Affairs is required to be held every two years.
- CICA members include 27 Asian countries, including Azerbaijan, Bahrain, China, Egypt, India, Iran, Israel, Russia, South Korea, and Turkey, nine observer states, and five international organizations.
- India co-chairs two CICA CBMs (Confidence Building Measures) on 'Development of Secure and Effective Systems of Transportation Corridors,' and 'Energy Security'.
- The CICA Secretariat has been located in Almaty (Kazakhstan) since June 2006.

Conference on Interaction and Confidence Building Measures in Asia (CICA)

- A multinational forum for enhancing cooperation towards promoting peace, security and stability in Asia
- Proposed by Nursultan Nazarbayev, Kazakhstan's first president, at the 47th Session of the United Nations General Assembly on October 5, 1992

Member states (27):

Afghanistan	Egypt	Kazakhstan	Republic of Korea
Azerbaijan	India	Kyrgyzstan	Russian Federation
Bahrain	Iran	Mongolia	Sri Lanka
Bangladesh	Iraq	Pakistan	Tajikistan
Cambodia	Israel	Palestine	Thailand
China	Jordan	Qatar	Turkey
United Arab Emirates	Uzbekistan	Vietnam	

Summits:

Second CICA summit — Almaty, Kazakhstan
June 4 2002 — First CICA summit — Almaty, Kazakhstan
June 17 2006
June 8 2010 — Third CICA summit — Istanbul, Turkey
Fourth CICA summit — Shanghai, China
May 21 2014
June 14–15 2019 — Fifth CICA summit — Dushanbe, Tajikistan

RAIL LINK BETWEEN NEPAL AND INDIA

Why in News

- The first stretch of rail link between Nepal and India is ready to resume on the neighbouring country's first-ever broad gauge passenger service (Jainagar-Bijalpura- Bardibas railway project).

KEY POINTS

Background :

- The rail link between Nepal and India has been popular since the early 20th century.
- In 1937, the British had built a narrow gauge line to ferry cargo, mainly logs, from Nepal to India.
- However, over time it became a popular passenger service before it was stopped in 2014 for conversion to broad gauge.

ONE SUN, ONE WORLD, ONE GRID (OSOWOG)

Why in News

India and the UK are likely to announce a joint declaration on "one sun, one world, one grid" — or OSOWOG at the upcoming Conference of Parties (COP26).

- The UN Climate Change Conference, or COP26, is scheduled to be held between 31st October and 12th November in Scotland.
- The concept of OSOWOG is what the British have called a green grid.
- The idea behind the concept is a trans-national electricity grid supplying solar power across the globe.

KEY POINTS

OSOWOG or the Green Grid:

- The vision behind the OSOWOG is 'The Sun Never Sets' and is a constant at some geographical location, globally, at any given point of time.
- This is by far one of the most ambitious schemes undertaken by any country (India) and is of global significance in terms of sharing economic benefits.
- It has been taken up under the technical assistance program of the World Bank.
- The OSOWOG plan may also leverage the International Solar Alliance (ISA), co-founded by India that has 80 countries as members.
- With India in the middle, the solar spectrum can easily be divided into two broad zones, which are:
  - ✓ Far East including countries like Myanmar, Vietnam, Thailand, Lao, Cambodia etc.
  - ✓ Far West covering the Middle East and the Africa Region.

IEA INVITES INDIA TO BE A FULL-TIME MEMBER

Why in News

- Recently, the International Energy Agency (IEA) has invited India, the world's third-largest energy consumer, to become its full-time member.

KEY POINTS

Background:

- India became an Associate member of IEA in March 2017 but it was in engagement with IEA long before its association with the organization.
- Earlier in 2021, India also inked a Strategic Partnership Agreement with the IEA to strengthen cooperation in global energy security, stability and sustainability.
- As a natural corollary to the India IEA strategic partnership, IEA invited India to deepen its cooperation with IEA by becoming a full Member.

6TH ANNUAL MEET: AIIB

Why in News

Recently, the Union Minister of Finance participated in the 6th Annual Meeting of the Board of Governors of Asian Infrastructure Investment Bank (AIIB).

KEY POINTS

India's Stand:

Help in Covid:

- Appreciated AIIB's prompt actions in providing financial support to Member Countries, including India, in their efforts to contain and combat Covid-19.

Multilateral Banking:

- Emphasised the importance of multilateral banks in supplementing countries' efforts to cope with the Covid-19 crisis and the looming climate crisis.

Expectations from the Bank:

- Need to explore investment opportunities in the creation and development of assets in social infrastructure sectors.
- To further intensify private sector capital mobilisation for inclusive and green development.
- To set up a Resident Board and Regional Offices to ensure accountability, transparency and quality of operations and investments.

AIIB's Stand:

Suggestion for India:

- It should strike a balance between ramping up physical infrastructure and the social infrastructure such as healthcare systems.

Future Endeavours in India:

- It would look to fund both social as well as climate-resilient infrastructure in India in the coming years.
- It will align its operations with the goals of the Paris Agreement to cope with climate change.

WORLD'S LARGEST KHADI NATIONAL FLAG

- On 2 October 2021, the World's largest Khadi national flag was installed at Leh in Ladakh on the occasion of Mahatma Gandhi's 152nd birth anniversary.
- It was inaugurated by Ladakh Lieutenant Governor RK Mathur.
- The tricolour flag, which is 225-feet long and 150-feet wide, weighs Around 1.000 kg. The flag has been made by Khadi and Village Industries Commission (KVIC) and was dis-played by the 57 Engineer Regiment of the Indian Army.

WORLD'S LARGEST NATIONAL FLAG MADE OF KHADI UNVEILED IN LADAKH

THE TRICOLOUR IS 225-FEET LONG AND 150-FEET WIDE, AND WEIGHS AROUND 1,000 KG !

MOMENT OF PRIDE, JAI HIND

RUSSIAN TEAM TO MAKE WORLD'S FIRST MOVIE IN ORBIT

- A Russian actor and a film director rocketed to space on a mission to make the world's first movie in orbit, a project the Kremlin said will help the nation's space glory. Actor Yulia Pereslld and director Klim Shlpenko blasted off for the International Space Station In a Russian Soyuz spacecraft together with cosmonaut Anton Shkaplerov, a veteran of three space missions. Their Soyuz MS-19 lifted off on.

- October 6 from the Russian space launch facility in Baikonur, Kazakhstan and arrived at the station after about 3-4 hours.

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GLOBAL HUNGER INDEX 2021

- In the Global Hunger Index (GHI) 2021, India slipped to the 101 rank out of 116 countries, from its 2020 ranking 94.

- The report prepared jointly by Irish aid agency Concern Worldwide and German organisation Welt Hunger Hilfe termed the level of hunger in India "alarming".

- The report released on 14 October 2021 revealed the data that India's GHI score has also decelerated from 38.8 in 2000 to the range of 28.8 - 27.5 between 2012 and 2021.

- In the 2021 Global Hunger Index. Belarus. Brazil, China and Turkey are one of 18 countries with a GHI score of less than 5.

- These countries are not assigned individual ranks, but rather are collectively ranked 1-18 out of 116 qualifying countries.

- The GHI score is calculated on 4 indicators - undernourishment: child wasting (the share of children under the age of five who are wasted i.e who have low weight for their height, reflecting acute undernutrition); child stunting (children under the age of five who have low height for their age, reflecting chronic under-nutrition) and child mortality (the mortality rate of children under the age of five).

GLOBAL

The international environmental think tank 'Germanwatch' released the Global Climate Risk Index 2021.

This is the 16th Edition of the Index. It is published annually.

Germanwatch, based on Bonn and Berlin (Germany), is an independent development and environmental organisation

Ranking 2019 Country

1 (54)	Mozambique
2 (132)	Zimbabwe
3 (135)	The Bahamas
4 (1)	Japan
5 (93)	Malawi
6 (24)	Islamic Republic of Afghanistan
7 (5)	India

GLOBAL FOOD SECURITY INDEX 2021

India is ranked at 71st position in the Global Food Security (GFS) Index 2021 of 113 countries. Earlier, India was ranked 101st position in the Global Hunger Index (GHI) 2021.

KEY POINTS

Developed by:

- The GFS Index was designed and constructed by London-based Economist Impact and is sponsored by Corteva Agriscience.
- The 2021 GFSI is the tenth edition of the index. It is published every year.

Calculation:

- It measures the underlying drivers of food security based on the following factors:
- Affordability
- Availability
- Quality and Safety
- Natural Resources and Resilience

GLOBAL CLIMATE RISK INDEX 2021

Why in News

The international environmental think tank 'Germanwatch' released the Global Climate Risk Index 2021.

- This is the 16th Edition of the Index. It is published annually.

- Germanwatch, based in Bonn and Berlin (Germany), is an independent development and environmental organisation which works for sustainable global development.

KEY POINTS

About the Index:

- The Index analyses the extent to which countries and regions have been affected by the impacts of weather-related loss events (storms, floods, heat waves etc.).
- The impact is calculated in terms of fatalities and economic losses, both.
- The most recent data available for 2019 and from 2000 to 2019 were taken into account.
- The 2021 Index does not include data from United States of America.

Ranking 2019 (2018)	Country	Ranking 2019 (2018)	Country
1(54)	Mozambique	6(24)	Islamic Republic of Afganistan
2(132)	Zimbabwe	7(5)	India
3(135)	The Bahamas	8(133)	South Sudan
4(1)	Japan	9(27)	Niger
5(93)	Malawi	10(59)	Bolvia

- The Climate Risk Index clearly signals that repercussions of escalating climate change can no longer be ignored, on any continent or in any region.
- Impacts from extremeweather events hit the poorest countries hardest as these are particularly vulnerable to the damaging effects of a hazard, have a lower coping capacity and may need more time to rebuild and recover.
- High-income countries are also getting severely impacted by climate change.

AWARDS

2021 RIGHT LIVELIHOOD AWARDS

- Delhi-based environmental organisa-tion Legal Initiative for Forest and Environment (LIFE) was conferred with the 2021 Right Livelihood Award for its grassroots approach of empowering vulnerable communities to protect their livelihoods and claim their right to a dean environment.
- Lawyers Rahul Choudhary and Ritwick Dutta founded LIFE in 2005.
- Cameroonian women rights activist Marthe Wandou. Russian environ-mental activist Vladimir Slivyak and Canadian Indigenous rights defender Freda Huson are other recipients of the Award.
- Right Livelihood Award is known as Sweden's alternative Nobel Prize. The recipient gets a cash prize of 1 million Swedish Kronor and long-term support to highlight and expand Laureates' work.

NOBEL PRIZES 2021

Field	Recipient	Contributions
Chemistry	Benjamin List and David W.C. MacMillan	Finding an easier and environmentally cleaner way to build molecules that can be used to make compounds, including medicines and pesticides(organocatalysis
Physics	Syukuro Manabe, Klaus Hasselmann and Giorgio Parisi	Understanding of complex physical systems.
Medicine	David Julius and Ardem Patapoutian	For their work in the field of somatosensation that is the ability of specialised organs such as eyes, ears and skin to see, hear an feel.
Peace Prize	Maria Ressa and Dmitry Muratov	For their efforts to safeguard freedom of expression, which is a precondition for democracy and lasting peace.
Literature	Abdulrazak Gurnah	For his uncompromising and compassionate penetration of the effects of colonialism and the fate of the refugee in the gulf between cultures and continents.
Economics	David Card, Joshua Angrist and Guido Imbens	Research on wages, jobs

The Earthshot Prize 2021

- Vidyut Mohan, a Delhi-based entrepreneur, won the inaugural edition of The Earthshot Prize.
- He won it for his innovative technology that recycles agricultural waste to create fuel.

PEACE PRIZE OF THE GERMAN BOOK TRADE

Why in News

- On 25 October 2021, the Zimbabwean author and filmmaker Tsitsi Dangarembga was honoured with the 'Peace Prize of the German Book Trade'.
- Her new novel 'This Mournable Body" was nominated for the shortlist of the Booker Prize in 2020.
- The Peace Prize of the German Book Trade, which has been awarded since 1950, is one of Germany's most important awards, worth 25,000 euros.

SPORTS

NAAMYA KAPOOR CLINCHES GOLD IN ISSF JUNIOR WORLD CHAMPIONSHIP

- India's 14-year-old shooter Naamya Kapoor clinched the gold medal In the women's 25-metre air pistol event of the ISSF (International shooting Sports Federation) Junior World Championship in Lima, Peru. The teenager finished on the top step of the podium ahead of celebrated compatriot Manu Bhaker who won the bronze medal.

- Kapoor shot 36 in the finals to claim the top prize ahead of France's Camille Jedrzejewski with 33 and 19-year-old Olympian Bhakar with 31, who has already won three gold medals so far in the tournament. Another Indian shooter, Rhythm Sangwan finished fourth in the final.

ANSHU MALIK SCRIPTS HISTORY WITH SILVER AT WORLD WRESTLING CHAMPIONSHIP
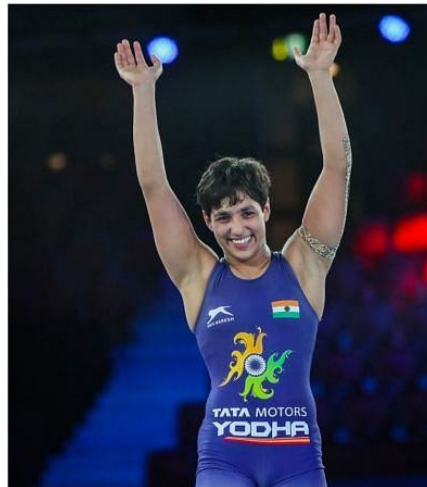
- Indian grappler Anshu Malik has scripted history as she became the first Indian woman to win a silver medal in the World Wrestling Championships Anshu lost to Olympic medallist Helen Maroulis of the USA 4-1 In the summit clash of women's 57 kg category at Oslo in Norway.

- Maroulis won the gold medal after her splendid show. Anshu Malik is a two-time Asian Championship medalist, which Includes gold, and a Ranking Series silver medalist. Previously, only five Indian women had won bronze at the world championship.

HOCKEY INDIA PULLS OUT OF NEXT YEAR'S COMMONWEALTH GAMES

Hockey India has pulled out of next year's Birmingham Commonwealth Games citing Covid-19 concerns and the UK's discriminatory quarantine rules for travelers from India. The move came after England withdrew from the Men's Junior Hockey World Cup In Bhubaneswar over similar reasons.

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MUGURUZA CLINCHES TITLE IN CHICAGO

- Garbine Muguruza rallied to beat ons Jabeur 3-6, 6-3, 6-0 in the Chicago fall tennis classic for her second WTA tour victory of the season and ninth overall the ninth-ranked Muguruza, from Spain, also won the Dubai duty free Tennis Championships in March.

PADDLER PAYAS IS WORLD NO.L IN U-17

- Payas Jain became the second Indian paddler to achieve a World No. 1 ranking, thanks to his title-winning performances in the Under-17 Boys category

COMMITTEE

COMMITTEE TO PROBE PEGASUS

Why in News

- A three-member committee has been appointed by the Supreme Court to look into allegations of unauthorised surveillance using Pegasus, a spyware developed by Israeli firm NSO Group.

- The committee members are Dr Naveen Kumar Chaudhary, Dean of National Forensic Sciences University in Gandhinagar; Dr Prabaharan P.

- Amrita Vishwa Vidyapeetham in Kerala; and Dr Ashwin Anil Gumaste, institute Chair Associate Professor at Indian Institute of Technology, Bombay.

- It will be supervised by retired judge Justice R V Raveendran. The former Supreme Court Justice is a highly-respected member of the law community, and was recently referred by Chief Justice of India NV Ramana as "one of the legends who have increased the prestige of the Supreme Court of India".

- Justice Raveendran served as judge of the Supreme Court from September 9, 2005 to October 15, 2011. Before that, he was Chief Justice of Madhya Pradesh High Court.

- Justice Raveendran was part of the R M Lodha Committee appointed by the SC in 2015 to reform the BCCI.NIPUN Bharat Mission

SUMMITS

18TH INDIA-ASEAN SUMMIT

Prime Minister Narendra Modi participated in the 18th India-ASEAN Summit at the invitation of His Majesty Sultan Haji Hassanal Bolkiah of Brunei, the current Chair of ASEAN.

- Highlighting the milestone of 30th anniversary of India-ASEAN Partnership, the leaders announced the Year 2022 as India-ASEAN Friendship Year.

- Building upon the synergies between the ASEAN Outlook for the Indo-Pacific (AOIP) and India's Indo-Pacific Oceans Initiative (IPOI), PM and ASEAN leaders welcomed the adoption of the India-ASEAN Joint Statement on cooperation for peace, stability and prosperity in the region.

- On COVID-19, the Prime Minister highlighted that India has contributed medical supplies worth USD 200,000 to ASEAN's humanitarian initiative for Myanmar and USD 1 million for ASEAN's Covid-19 Response Fund.

- Prime Minister Modi announced India's support for establishing the ASEAN Cultural Heritage List.

SCIENCE AND TECHNOLOGY

INDIAN SPACE ASSOCIATION (ISPA)

Why in News

- Recently, the Prime Minister has launched the Indian Space Association (ISpA) via video conferencing. ISpA will act as a single-window and independent agency on matters related to space technology.
- The PM also remarked that the Government's approach to space reforms is based on 4 pillars.

KEY POINTS

About ISpA :

- ISpA aspires to be the collective voice of the Indian Space industry. ISpA will be represented by leading domestic and global corporations that have advanced capabilities in space and satellite technologies.
- ISpA will undertake Policy Advocacy and engage with all stakeholders in the Indian Space domain, including the Government and its Agencies, to make India self-reliant, technologically advanced and a leading player in the space arena.
- ISpA will also work towards building global linkages for the Indian space industry to bring in critical technology and investments into the country to create more high skill jobs.

Significance of ISpA:

- One of the main goals of the organisation is to supplement the government's efforts towards making India a global leader in commercial spacebased excursions.
- Of late, ISRO's rockets have been carrying the payload and communication satellites of various countries; now, private players will also look to touch on this space with the new organisation.
- Several private sector companies have shown an interest in India's space domain, with space-based communication networks coming to the fore.

DRAFT REGIONAL PLAN 2041: NCR
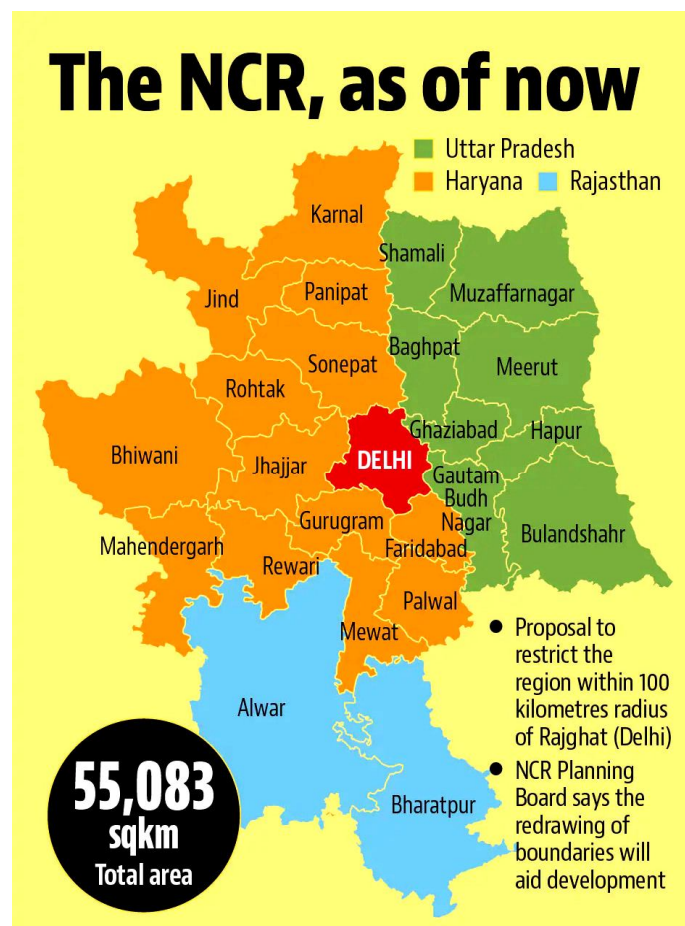
Why in News

- The National Capital Region Planning Board (NCRPB) has recently approved the 'Draft Regional Plan 2041' according to which the National Capital Region (NCR) is likely to reduce in size.
- NCRPB was set up in 1985, to promote balanced development of the NCR and to avoid haphazard development.

KEY POINTS

About:

New Boundary:

- The geographical size of the region will be a contiguous circular region of 100km radius from Rajghat (Delhi). The area in the 100km radius can be developed as a core area.

The NCR, as of now

Uttar Pradesh   Haryana   Rajasthan

Karnal, Shamali, Jind, Panipat, Muzaffarnagar, Baghpat, Sonepat, Meerut, Rohtak, Ghaziabad, Hapur, Bhiwani, Jhajjar, DELHI, Gautam Budh Nagar, Gurugram, Bulandshahr, Mahendergarh, Faridabad, Rewari, Palwal, Mewat, Alwar, Bharatpur

- Proposal to restrict the region within 100 kilometres radius of Rajghat (Delhi)
- NCR Planning Board says the redrawing of boundaries will aid development

55,083 sqkm Total area

- NCR is a region envisaged in 1985 for coordinated urban development in and around Delhi.
- Beyond 100 km radius and up to the existing NCR boundary, all notified cities/ towns along with a corridor of one km on either side of connecting expressways/ national highways/state highways/ Regional Rapid Transit System will be included.
- Currently, the NCR consists of 24 districts in Uttar Pradesh, Haryana and Rajasthan and entire Delhi, spread across an area of 55,083 square kilometres.

Name of Natural Conservation Zones:

- The name of natural conservation zones, as introduced in the Regional Plan-2021 will be changed to "natural zones" in the upcoming Regional Plan-2041.

Empowering States:

- States will be empowered to decide whether tehsils that fall partly inside the NCR boundary should remain in it or not.

Slum-free NCR:

- The DRP 2041 Plan will pave the way for a future-ready, slum-free National Capital Region with an air ambulance facility and high-speed connectivity through helitaxis, road, rail, and inland waterways.

Improved Rail Connectivity:

- The Plan proposes to explore the feasibility of a 30-minute Mass Transit Rail System (MTRS) from the nearest NCR boundaries to Delhi.

SILICOSIS

Why in News

  In India, countless workers engaged in mines, construction and factories are silently dying of exposure to dust. This is better referred to as silicosis.

- Silicosis can be described as an occupational disease or hazard due to dust exposure. It is incurable and can cause permanent disability.
- However, it is 'totally preventable by available control measures and technology.

Silicosis: Occupational lung disease

Silicosis is an often fatal lung disease caused by breathing dust containing crystalline silica particles, a basic component of sand and granite. There is no cure for silicosis, and treatment options are limited. However, the condition can be prevented if measures are taken to reduce exposure.

Inhaling the dust can cause scar tissue to form in the lungs that reduces the lungs' ability to extract oxygen from the air.

Symptoms

Continued exposure:
➤ Shortness of breath
➤ Fever
➤ Bluish skin at the ear lobes or lips

As the disease progresses:
➤ Fatigue
➤ Extreme shortness of breath
➤ Loss of appetite
➤ Chest pain
➤ Respiratory failure

At-risk occupations
➤ Construction
➤ Mining
➤ Sandblasting
➤ Masonry
➤ Demolition
➤ Manufacturing of glass and metal products
➤ Plumbing
➤ Painting

CRYSTALLINE SILICA DUST

Silica dust particles can embed themselves in the alveolar sacs deep in the lungs where they cannot be cleared by mucous or coughing.

Alveolar sacs

Source: U.S. Department of Labor Occupational Safety and Health Administration, silicosis.com

AMY LEWIS/The Salt Lake Tribune

QUANTUM KEY DISTRIBUTION

Why in News

Recently, the government has inaugurated C-DOT's (Centre for Development of Telematics) Quantum Communication Lab and unveiled the indigenously developed Quantum Key Distribution (QKD) solution.

- The government has also allocated USD 1 billion for the National Mission on Quantum Technologies and Applications spanning over a period of 8 years.

KEY POINTS

About:

- QKD, also called Quantum Cryptography, is a mechanism to develop secure communication.
- It provides a way of distributing and sharing secret keys that are necessary for cryptographic protocols.

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- ✓ Cryptography is the study of secure communications techniques that allow only the sender and intended recipient of a message to view its contents.
- ✓ Cryptographic algorithms and protocols are necessary to keep a system secure, particularly when communicating through an untrusted network such as the Internet.
- The conventional cryptosystems used for dataencryption rely on the complexity of mathematical algorithms, whereas the security offered by quantum communication is based on the laws of Physics.

Mechanism:

- In the QKD, encryption keys are sent as 'qubits' (or quantum bits) in an optical fibre.
  - ✓ Optical fibers are capable of transmitting more data over longer distances and faster than other mediums. It works on the principle of total internal Reflections.
- QKD implementation requires interactions between the legitimate users. These interactions need to be authenticated. This can be achieved through various cryptographic means.
  - ✓ QKD allows two distant users, who do not share a long secret key initially, to produce a common, random string of secret bits, called a secret key.
- The end-result is that QKD can utilize an authenticated communication channel and transform it into a secure communication channel.
- It is designed in a way that if an illegitimate entity tries to read the transmission, it will disturb the qubits – which are encoded on photons.
- This will generate transmission errors, leading to legitimate end-users being immediately informed.
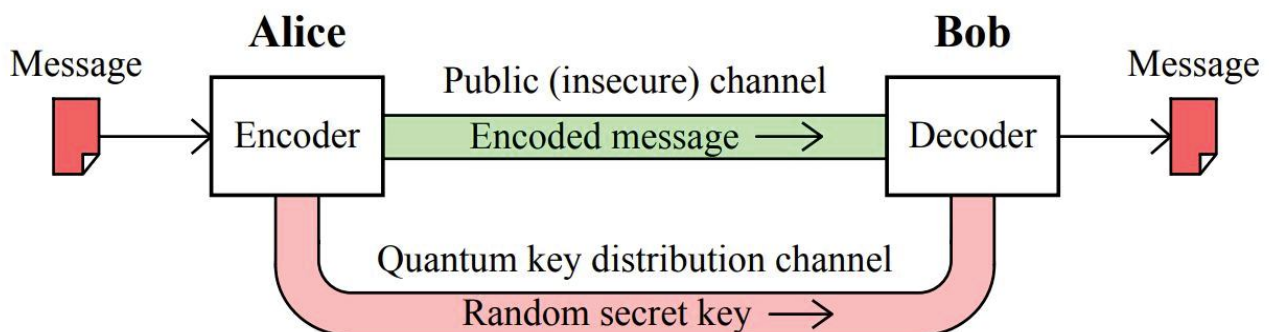
Qubits:

- Conventional computers process information in 'bits' or 1s and 0s, following classical physics under which our computers can process a '1' or a '0' at a time

- Quantum computers compute in qubits. They exploit the properties of quantum mechanics, the science that governs how matter behaves on the atomic scale.
  - ✓ In this scheme of things, processors can be a 1 and a 0 simultaneously, a state called quantum superposition.
  - ✓ Because of quantum superposition, a quantum computer - if it works to plan - can mimic several classical computers working in parallel
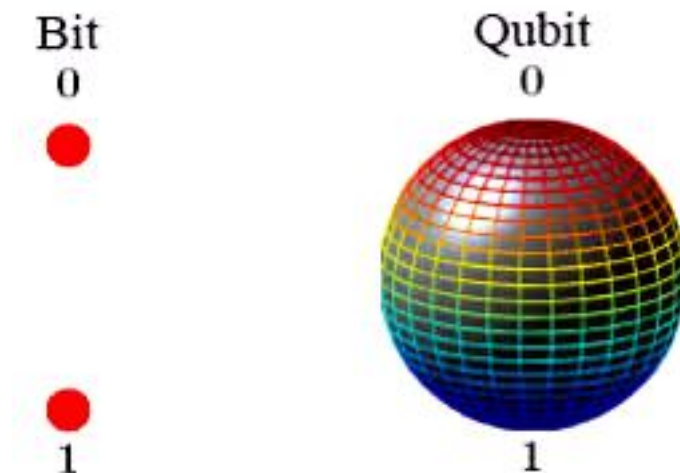
Need:

- QKD is essential to address the threat that rapid advancement in Quantum Computing poses to the security of the data being transported by various critical sectors through the current communication networks.

Benefits

- The technology would be useful in enabling various start-ups and small and medium enterprises in   the domain of quantum information.
- It is expected to create a definition of standards and formulate crypto technology-related policies.

Significance:

Detection of Leak:

- It allows the detection of data leak or hacking because it can detect any such attempt.

Predetermined Error Levels:

- It also allows the process of setting the error level between the intercepted data.

Unbreakable Encryption:

- The encryption is unbreakable and that's mainly because of the way data is carried via the photon.
- A photon cannot be perfectly copied and any attempt to measure it will disturb it. This means that a person trying to intercept the data will leave a trace.

6G TECHNOLOGY

Why in News

Recently, the government has asked the Centre for Development of Telematics (C-DOT) to begin developing 6G and other futuristic technologies to catch up with the global market in time.

- The next generation telecom technology (6G) is said to be 50 times faster than 5G and is expected to be commercially launched between 2028-2030.
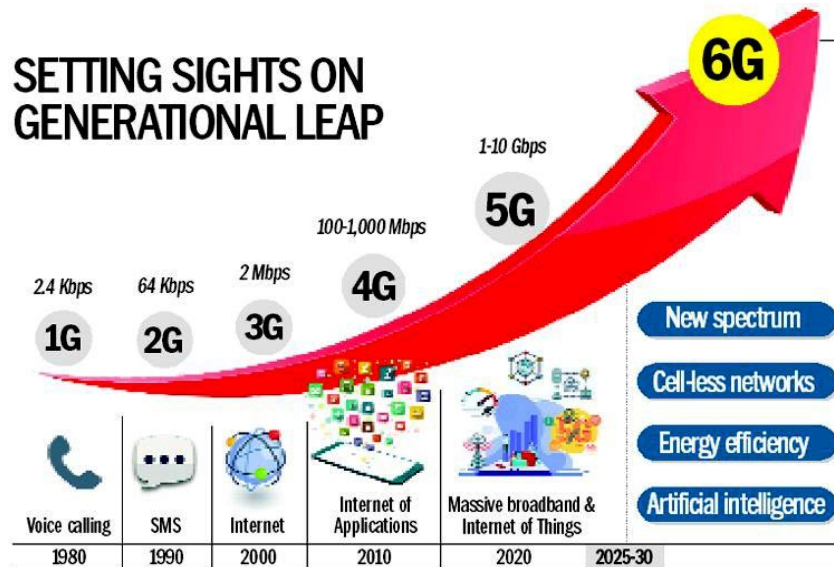
KEY POINTS

About:

- 6G (sixth-generation wireless) is the successor to 5G cellular technology.
- It will be able to use higher frequencies than 5G networks and provide substantially higher capacity and much lower latency (delay).

- One of the goals of 6G internet will be to support one microsecond-latency communication (delay of one-microsecond in communication).
  - ✓ This is 1,000 times faster – or 1/1000th the latency – than one millisecond throughput.
- It seeks to utilize the terahertz band of frequency which is currently unutilized.
  - ✓ Terahertz waves fall between infrared waves and microwaves on the electromagnetic spectrum.
  - ✓ These waves are extremely tiny and fragile, but there's a huge amount of free spectrum up there that would allow for spectacular data rates.

Significance:

More facilitation:

- The 6G technology market is expected to facilitate large improvements in imaging, presence technology and location awareness.
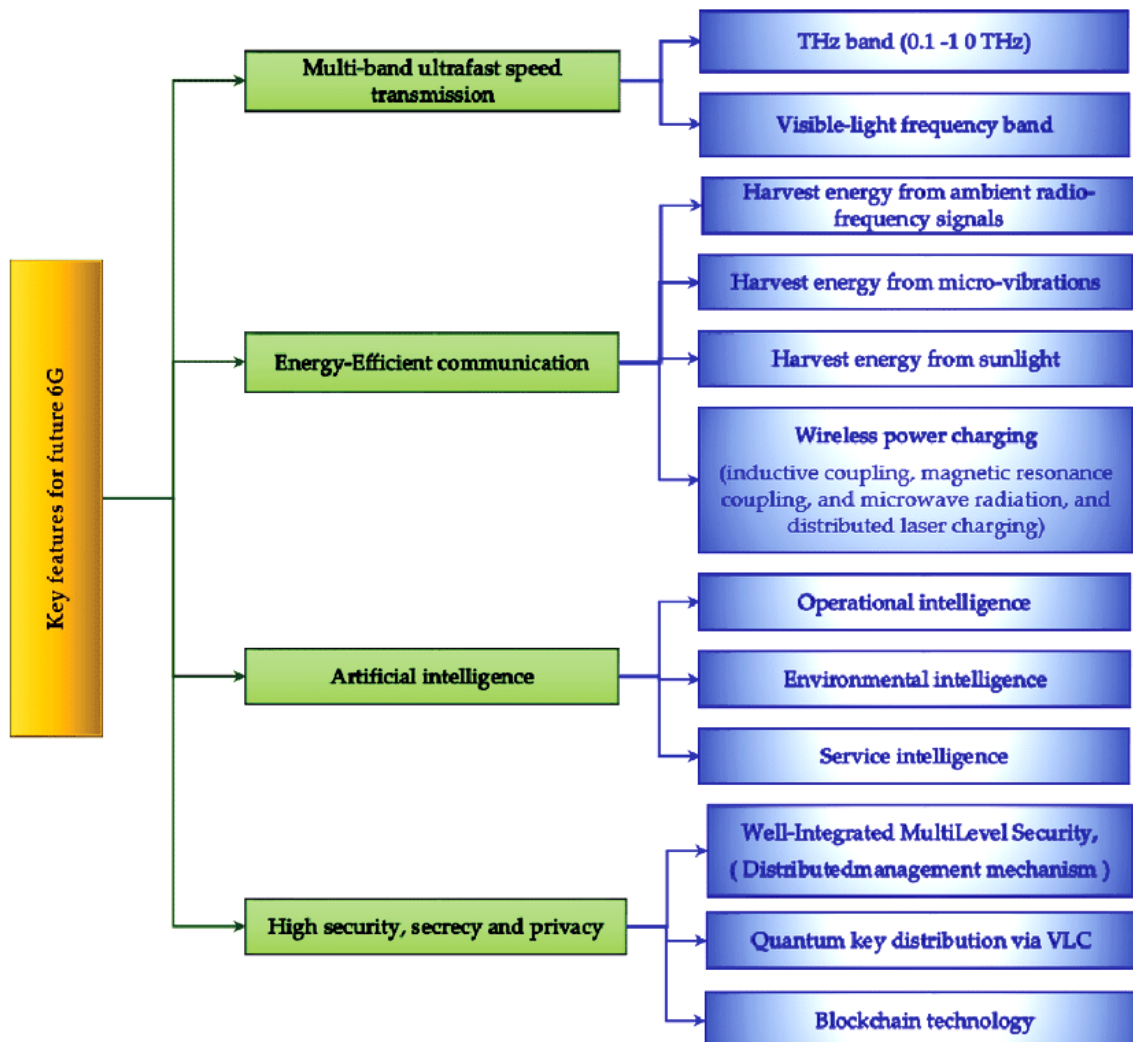
- 6G's higher frequencies will enable much faster sampling rates, in addition to providing significantly   better throughput and higher data rates.

Advancement in Wireless sensing technology:

- The combination of sub-mm waves (e.g., wavelengths smaller than one millimeter) and frequency selectivity to determine relative electromagnetic absorption rates could potentially lead to significant advances in wireless sensing technology.

Emergence of Digital Capabilities:

- It will see the emergence of simple, easy-towear - and-carry devices with a huge set of digital capabilities.
- This will help the paramedics, educators and agrotechnicians to jumpstart the village ecosystems with little or limited need for on-site presence of doctors, professors and agro-experts.

Optimising mass public transportation:

- For India, such an enabling set of technologies will bring manifold utilisation of scarce rail, air and road networks and make mass transportation far more efficient; Artificial Intelligence (AI) and massively parallel computing architectures will help solve transportation and scheduling operations research problems.

Challenges:

Maintaining Protection Mechanisms:

- The key technical challenges are energy efficiency, avoiding signal attenuation due to obstructions maintaining end-to-end trust through robust cyber security and data protection mechanisms.

Adoption of New Models:

- Need innovations in antenna design, miniaturisation, edge cloud and distributed AI models. In addition, we need to ensure end-to-end security and privacy by design, instead of as an afterthought.

Availability of Semiconductor:

- We don't have semiconducting materials that can use multi-THz frequencies. Getting any kind of range out of those frequencies may require enormous arrays of extremely tiny antennas.

Complex Design for Carrier Wave:

- Water vapor in the atmosphere blocks and reflects THz waves, so mathematicians will have to design models that allow data to take very complex routes to its destination.

CENTRE FOR DEVELOPMENT OF TELEMATICS (C-DOT)

- It was established in 1984. It is an autonomous Telecom R&D (Research and Development) centre of DoT (Department of Telecom), Ministry of Communications.
- It is a registered society under the Societies Registration Act,1860.
- It is a registered public-funded research institution with the Department of Scientific and Industrial Research (DSIR), Ministry of Science &Technology.
- Currently, C-DOT is working towards realising the objective of various flagship programmes of Govt. of India which include Digital India, BharatNet, Smart Cities etc.

KATOL METEORITE

Why in News

Recently, some researchers studied a meteorite from Katol, Maharashtra which was from the meteor shower of 2012.

- A meteorite is a solid piece of debris from an object, such as a comet, asteroid, or meteoroid, that originates in outer space and survives its passage through the atmosphere to reach the surface of a planet or moon.

KEY POINTS

Findings:

Depth of Olivine:

- Initial studies revealed that the host rock was mainly composed of olivine, an olive-green mineral.
- Olivine is the most abundant phase in our Earth's upper mantle.
   - ✓ Earth is composed of different layers including the outer crust, followed by the mantle and then the inner core.
- It was believed that we can reach the upper mantle if we drill for about 410 kilometers.

- However, by studying the composition of these meteorite fragments, researchers have unravelled the composition expected to be present in the Earth's lower mantle which is at about 660 km deep.

Formation of Bridgmanite:

- Various computational and experimental studies have shown that about 80% of the Earth's lower mantle is made up of bridgmanite. By studying this meteorite sample, scientists can decode how bridgmanite crystallized during the final stages of our Earth's formation.
  - ✓ Bridgmanite is a magnesium-silicate mineral, $MgSiO_3$, the most abundant mineral on earth.
  - ✓ The mineral was named in 2014 after Prof. Percy W. Bridgman, recipient of the 1946 Nobel Prize in Physics.
- As the bridgmanite of the Katol meteorite sample closely matches with the bridgmanite on Earth.

Bridgmanite on Earth vs Meteorite:

- The bridgmanite in the meteorite was found to be formed at pressures of about 23 to 25 gigapascals generated by the shock event.
- The high temperature and pressure in our Earth's interior have changed over billions of years causing crystallisation, melting, remelting of the different minerals before they reached their current state.

Significance:

- Studying the meteorite could also tell us more about how our Earth evolved from being a magma ocean to a rocky planet and researchers can unearth more details about the formation of Earth.
- It is important to study these individual minerals to get a thorough idea of how and when the Earth's layers formed.
- Scientists can also decode how bridgmanite crystallized during the final stages of our Earth's formation.

FORMATION OF INNER PLANETS (EARTH)

- The inner planets or terrestrial planets or rocky planets Mercury, Venus, Earth, and Mars are formed by accretion or by rocky pieces coming together and forming a planet by increased pressure and high temperature caused by radioactive elements and gravitational forces.

- Earth was an ocean of magma before the elements crystallised and stabilised and the different layers such as core, mantle and crust were formed.

- The heavier elements like iron went to the core while the lighter silicates stayed in the mantle.
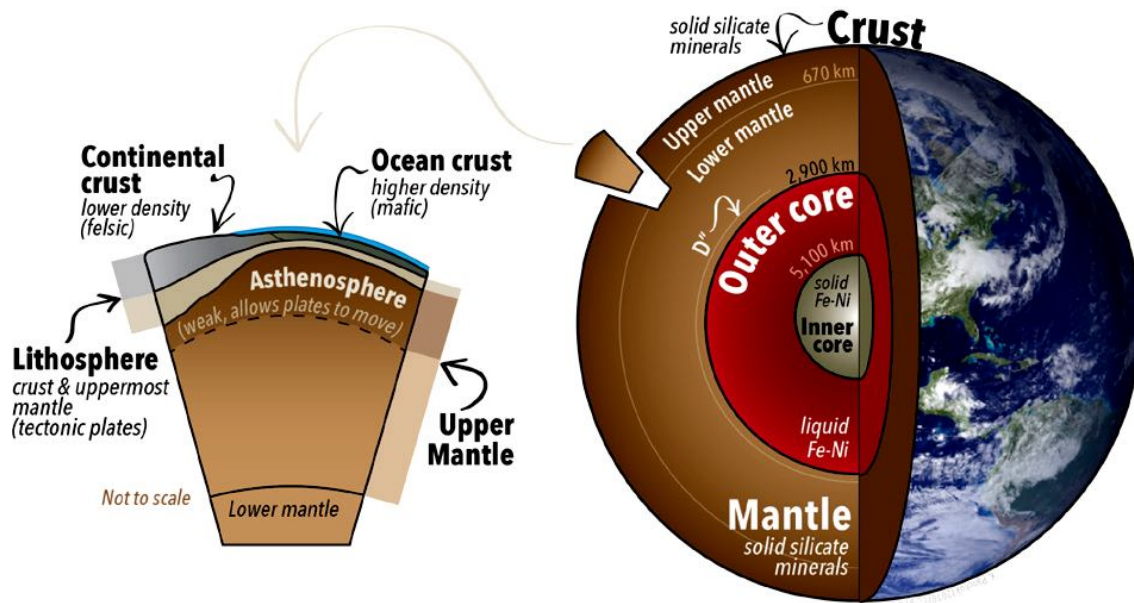

MISSION LUCY: NASA

Why in News

National Aeronautics and Space Administration (NASA) is set to launch 'Lucy', its first mission to explore the Jupiter Trojan Asteroids.

KEY NOTES

Mission Lucy:

Duration:

- The solar-powered mission is estimated to be over 12 years long, during which the spacecraft will visit eight asteroids covering a distance of about 6.3 billion km to deepen the understanding of the "young solar system".
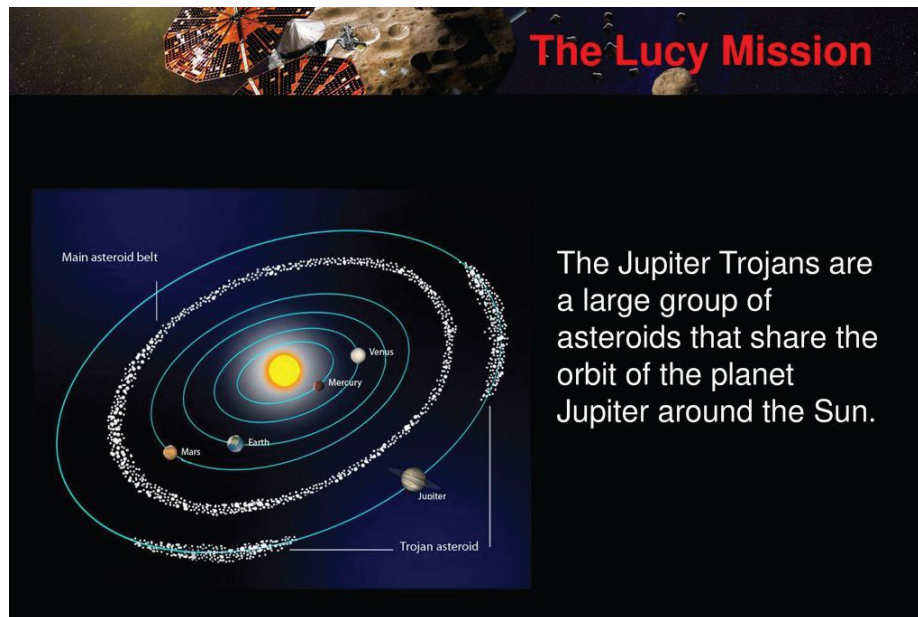
Name and Launch:

- The mission is named after 'Lucy', a 3.2 millionyear- old ancestor who belonged to a species of hominins (which include humans and their ancestors). The spacecraft will be launched on an Atlas V 401 rocket.

Asteroid Donald Johnson:

- The spacecraft's first encounter will be with an asteroid that lies in the main belt that can be found between Mars and Jupiter. This asteroid is named 'Donald Johnson' after the paleoanthropologist who discovered the fossilised remains of 'Lucy'.

Significance:

- The Trojan asteroids are believed to be formed from the same material that led to the formation of planets nearly 4 billion years ago when the solar system was formed.
- Therefore, the mission is designed to understand the composition of the diverse asteroids that are a part of the Trojan asteroid swarms, to determine the mass and densities of the materials and to look for and study the satellites and rings that may orbit the Trojan asteroids.
- Studying them will help scientists understand its origins and evolution, and why it looks the way it does.

Asteroids

About:

- Asteroids are rocky objects that orbit the Sun, much smaller than planets. They are also called minor planets.

Categories:

Main Belt of Asteroids:

- First, those found in the main asteroid belt, between Mars and Jupiter. This region is estimated to contain somewhere between 1.1-1.9 million asteroids.

Trojan:

- The second group is that of trojans (the name comes from Greek mythology), which are asteroids that share an orbit with a larger planet.
- NASA reports the presence of Jupiter, Neptune and Mars trojans. In 2011, they reported an Earth trojan as well.
- The Jupiter asteroids can be found in what are referred to as "swarms" that lead and follow the planet Jupiter along its orbit around the Sun.
- 'Lucy' will reach the first swarm of these asteroids that precede Jupiter by August 2027.
- These asteroids are believed to be the remnants of the early solar system.

Near-Earth Asteroids:

- The third classification of asteroids is under Near-Earth Asteroids (NEA), which has orbits that pass close to the Earth. Those that cross the Earth's orbit are called Earth-crossers.
- More than 10,000 such asteroids are known, of which over 1,400 are classified as Potentially Hazardous Asteroids (PHAs).

Jupiter

- Fifth in line from the Sun, Jupiter is, by far, the largest planet in the solar system – more than twice as massive as all the other planets combined.
  - ✓ Jupiter, Saturn, Uranus and Neptune are called Jovian or Gas Giant Planets. These have thick atmospheres, mostly of helium and hydrogen.

- Jupiter rotates once about every 10 hours (a Jovian day), but takes about 12 Earth years to complete one orbit of the Sun (a Jovian year). Jupiter has more than 75 moons.
  - ✓ The major moons of Jupiter are named Io, Europa, Ganymede, and Callisto, which are each distinctive worlds.
- In 1979, the Voyager mission discovered Jupiter's faint ring system. Nine spacecraft have visited Jupiter. Seven flew by and two have orbited the gas giant. Juno, the most recent, arrived at Jupiter in 2016.

ASTRO ROBOT

Why in News

Recently, Amazon has unveiled its 'Astro' home robot, which is designed to help customers with a range of tasks like home monitoring and keeping in touch with family.

- However, civil society has highlighted the concerns of privacy issues of 24×7 surveillance.

KEY POINTS

About Astro Robot:

- Astro is primed to be a home security device. It is designed to move around the home and keep a check on pets, and detect something unusual in the absence of the owner.

- It comes with a "periscope" camera that pops up from its head and can be used to keep an eye on the home.

- It is basically a combination of the Echo Show (smart speaker) and sophisticated Ring security camera integrated into one single device.
- The device captures live videos, recognises faces, plays music or videos, and delivers a beer across the home.
- It can recognise the faces of people and analyse them until it figures out if it's a family member or an outsider.

Issues Related to Privacy:

- Civil society is worried that the amount of data Amazon gets to fetch with the Astro, giving the company easy access to the household,
  - ✓ This is going one step beyond Alexa which had access to vocals and sound until now.
  - ✓ Amazon has asserted that Astro stores face data locally rather than in the cloud, but it is still a privacy concern as with any internetconnected device.
- There are concerns of stealing or hacking of the device. Due to this, the perpetrator can get access to the digital map that the robot creates of someone's home.
- The prime concern, in the long-run, could contribute to greater public acceptance of Artificial Intelligencepowered surveillance.
  - ✓ In the past, hackers have managed to access Ring cameras, used in the devices of Amazon technologies.

Other Recent Experiments:

- Softbank earlier this year "suspended" the production of Pepper, one of the first humanoid robots able to "read" emotions.
- Jibo has started an Indiegogo project, which aims to build a world's first social robot for the home.

ROBOTICS

About:
- Robotics is a branch of engineering that involves the conception, design, manufacture and operation of robots.
  - ✓ Robot is any automatically operated machine that replaces human effort.
- The objective of the robotics field is to create intelligent machines that can assist humans in a variety of ways.

Advantages:

- In many situations robots can increase productivity, efficiency, quality and consistency of products.
- Robots can work in environments which are unsafe for humans as they don't have the same environmental requirements that humans do - such as lighting, air conditioning or noise protection.
- Robots have some sensors/actuators which are more capable than humans.
  - ✓ Unlike humans, robots don't get bored. Until they wear out, they can do the same thing again and again.
  - ✓ They can be very accurate – to fractions of an inch (as is needed for example in manufacturing of microelectronics).

Disadvantages:

- The use of robots can create economic problems if they replace human jobs.
- Robots can only do what they are told to do – they can't improvise
- This means that safety procedures are needed to protect humans and other robots.
- Although robots can be superior to humans in some ways, they are less dexterous than humans.
  - ✓ Robotics lack emotional intelligence, which plays a critical role in intense situations.
- Often robots are very costly – in terms of the initial cost, maintenance, the need for extra components   and the need to be programmed to do the task.
- Surveillance concerns pose a problem of entering a privacy nightmare.

GENETICALLY MODIFIED (GM) CROPS

Why in News

According to the Coalition for GM Free India, the discovery of 500 tonnes of Genetically Modified (GM) rice in a consignment that India exported to the European Union countries in June 2021 has led to the "loss of reputation of India and its agricultural market''.
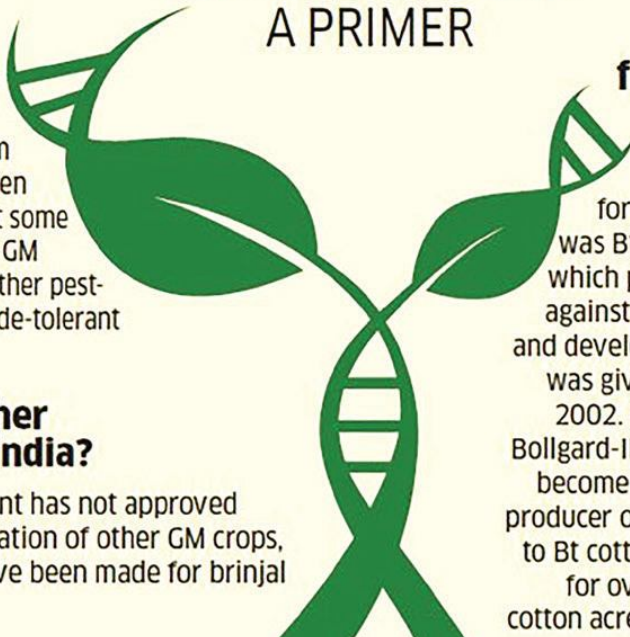
- However, India pointed out that GM rice is not grown commercially in India, let alone exported, and promised a thorough enquiry by its agricultural exports authority, the Agricultural and Processed Food Products Export Development Authority (APEDA).

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KEY POINTS

GM Crops:

- GM foods are derived from plants whose genes are artificially modified, usually by inserting genetic material from another organism, in order to give it a new property, such as increased yield, tolerance to a herbicide, resistance to disease or drought, or to improve its nutritional value.
- Probably the best known variety of GM rice is golden rice.
  - ✓ Golden rice involves the insertion of genes from a plant – both daffodils and maize have been used – and a soil bacterium to create a grain that is enriched with Vitamin A.
- India has approved commercial cultivation of only one GM crop, Bt cotton.
- No GM food crop has ever been approved for commercial cultivation in the country.
  - ✓ However, confined field trials have been allowed for at least 20 GM crops.
- That includes varieties of GM rice which would have improved resistance to insects and diseases, as well as hybrid seed production and nutritional enhancements such as golden rice.
- The cons of GM foods are that they may cause allergic reactions because of their altered DNA and they may increase antibiotic resistance

GM CROPS IN INDIA A PRIMER

What is a GM crop?

A crop which has a gene artificially inserted into it from another species, even unrelated, to give it some desired properties. GM crops are mostly either pest-resistant or herbicide-tolerant

Are there other GM crops in India?

No, the government has not approved commercial cultivation of other GM crops, though efforts have been made for brinjal and mustard

When did India get its first GM crop?

The first GM crop variety approved for commercialisation was Bt cotton. Bollgard-I, which provided immunity against the pink bollworm and developed by Monsanto, was given the go ahead in 2002. Monsanto released Bollgard-II in 2006. India has become the world's largest producer of cotton partly due to Bt cotton, which accounts for over 90% of the total cotton acreage in the country

HYPERSONIC TECHNOLOGY

Why in News

Recently, it has been reported that China tested a nuclear-capable hypersonic glide vehicle that circled the globe before speeding towards its target.

- Several countries, including the US, Russia and China, are developing hypersonic missiles which travel at a speed five times that of sound.
- Though slower than ballistic missiles, they are harder to intercept and can be manoeuvred.

KEY POINTS

Implications for India:

- Hypersonic technology developments, in the backdrop of growing US-China rivalry and a yearlong standoff with Indian forces in eastern Ladakh, is certainly a threat for India's space assets along with the surface assets.
- The offence system operating at these speeds would mean a requirement to develop defence systems at these speeds.

WHITE DWARF

Why in News

Recently, an international team saw a white dwarf losing its brightness in 30 minutes, which usually takes a period of several days to months.

- This peculiarity in brightness of white dwarfs can be referred to as switch on and off phenomena
- Using the Hubble Space telescope and Transiting Exoplanet Survey Satellite (TESS), astronomers have identified several white dwarfs over the years.

KEY POINTS

About White Dwarfs :

Formation:

- White dwarfs are stars that have burned up all of the hydrogen they once used as nuclear fuel.
  - ✓ Such stars have very high density.
  - ✓ A typical white dwarf is half the size of our Sun and has a surface gravity 1,00,000 times that of Earth.

- Stars like our sun fuse hydrogen in their cores into helium through nuclear fusion reactions.
- Fusion in a star's core produces heat and outward pressure (they bloat up as enormous red giants), but this pressure is kept in balance by the inward push of gravity generated by a star's mass.
- When the hydrogen, used as fuel, vanishes and fusion slows, gravity causes the star to collapse in on itself into white dwarfs.

Black Dwarfs:

- Eventually - over tens or even hundreds of billions of years - a white dwarf cools until it becomes a black dwarf, which emits no energy. Because the universe's oldest stars are only 10 billion to 20 billion years old there are no known black dwarfs.
- It must be noted that not all white dwarfs cool and transform into black dwarfs.

CONVERTING CO_2 TO METHANE

Why in News

Recently, Indian Scientists have designed a photochemical method (Photocatalyst) to convert Carbon Dioxide (CO_2)to Methane (CH_4).

- A photochemical method is a chemical reaction initiated by the absorption of energy in the form of light.

KEY POINTS

About:

- A polymer has been designed to absorb visible light and catalyse the reaction which reduces CO_2.
  - ✓ Most catalysts contain toxic and expensive metal counterparts. Therefore scientists designed a metal-free porous organic polymer to overcome this drawback.
- The photochemical method of reducing CO2 uses solar light as a renewable source of energy.
  - ✓ There are several ways in which CO2 can be reduced, including photochemical, electrochemical, photoelectrochemical, photothermal, and so on.

ENERGY SECTOR

CYBERSECURITY GUIDELINES FOR POWER SECTOR

Why in News

Recently, the government released cybersecurity guidelines for the power sector.

- This is the first time that a comprehensive guideline has been formulated on cyber security in the power sector.
- The guidelines are a precursor to cybersecurity regulations that the Central Electricity Authority (CEA, Ministry of Power) is working on.

KEY POINTS

About:

- CEA has framed the guidelines under the Central Electricity Authority (Technical Standards for Connectivity to the Grid) (Amendment) Regulations, 2019.
- It lays down a cyber assurance framework, strengthens the regulatory framework, puts in place mechanisms for security threat early warning, vulnerability management and response to security threats, and secures remote operations and services, among others.
- The norms are applicable to all responsible entities as well as system integrators, equipment manufacturers, suppliers/ vendors, service providers, and Information Technology (IT) hardware and software OEMs (Original Equipment Manufacturers) engaged in the Indian power supply system.
- Responsible Entities include power generation utilities, distribution utilities, transmission companies and load dispatch centres among others.

MAJOR GUIDELINES:

Procure from Trusted Source:

- Mandates Information & Communication Technology-based procurement from identified 'trusted sources' and 'trusted products' or else the product has to be tested for malware/hardware trojan before deployment for use in the power supply system network.

Chief Information Security Officer:

- Appointment of a Chief Information Security Officer (CISO) at each responsible entity as well as the setting up of an Information Security Division headed by the CISO.

Procedure for Identifying and Reporting:

- The entities will also be required to incorporate a procedure for identifying and reporting any disturbances suspected or confirmed to be caused by sabotage and submit the report to the sectoral CERT and Computer Emergency Response Team -India (CERT-In) within 24 hours.

Significance:

- It will promote research and development in cybersecurity and open up the market for setting up cyber testing infra in public as well as private sectors in the country.

HELI-BORNE SURVEY FOR WATER MANAGEMENT

Why in News

Recently, the Ministry of Jal Shakti has launched a Heli-Borne Survey Technology for water management in the arid areas of Rajasthan.

KEY POINTS

About:

- Developed by Council of Scientific and Industrial Research (CSIR)-National Geophysical Research Institute (NGRI), it will provide information about level, quantity, quality and information of ground water.
- The NGRI is a geoscientific research organization established in 1961 under the CSIR.
- The Heli-borne geophysical mapping technique of CSIR-NGRI provides a high-resolution 3D image of the subsurface up to a depth of 500 metres below the ground.
- The main advantages of the Heliborne geophysical survey is that it is fast, highly data dense, precise and economical.
- This survey will be carried out in two phases, of which the first phase comprises an area spanning 1 lakh sq km.
- This includes 65,000 sq km in Rajasthan, 32,000 sq km in Gujarat and 2,500 sq km in Haryana.

- It is to be implemented in collaboration with the Ministry of Jal Shakti as a part of National Aquifer Mapping Project.

Significance:

- Larger areas can be covered to derive more accurate data to help utilize groundwater for drinking purposes.
- It will help in water conservation, identification of new places for ground water recharging and that too at lesser cost than the prevalent ones like digging tube wells using geophysics and remote sensing techniques.
- It will help in devising new schemes for improvement in water level in water scant areas.

JAL JEEVAN MISSION APP

Why in News

Recently, the Prime Minister launched the Jal Jeevan Mission (JJM) mobile application on the occasion of Gandhi Jayanti (2nd October).

- The PM also released the progress report of the JJM and a manual for the utilisation of the 15th Finance Commission grant for rural local bodies.

KEY POINTS

About:

- The mobile application will provide details of water infrastructure, an Aadhaar-verified data set of beneficiaries, and water quality and contaminationrelated information for each village.
- The application aims to improve awareness among stakeholders and for greater transparency and accountability of schemes under the Jal Jeevan mission.
- The Jal Shakti ministry has been maintaining a JJM dashboard to show the coverage of tap water connections across states.
- The water quality management information system provides details of water samples received and tested across labs and states. The mobile app will bring all this data under one umbrella.

SCHEMES

SWADESH DARSHAN SCHEME

Why in News

Recently, under the Swadesh Darshan Scheme, the Tourism Ministry sanctioned 5 projects of Rs 325.53 crore for Buddhist circuit development.

- It has also organised a Buddhist Circuit Train FAM Tour as part of the Union government's Dekho Apna Desh initiative.
- The tour covers the destinations Gaya-Bodhgaya, Rajgir-Nalanda in Bihar as well as Sarnath-Varanasi in Uttar Pradesh.

KEY POINTS

About:

- Swadesh Darshan, a Central Sector Scheme, was launched in 2014-15 for integrated development of theme based tourist circuits in the country.
- This scheme is envisioned to synergise with other schemes like Swachh Bharat Abhiyan, Skill India, Make in India etc.
- Under the scheme, the Ministry of Tourism provides Central Financial Assistance (CFA) to State Governments/Union Territory Administrations for infrastructure development of circuits.
- One of the objectives of the scheme is to develop theme-based tourist circuits on the principles of high tourist value, competitiveness and sustainability in an integrated manner.

Tourism Circuits:
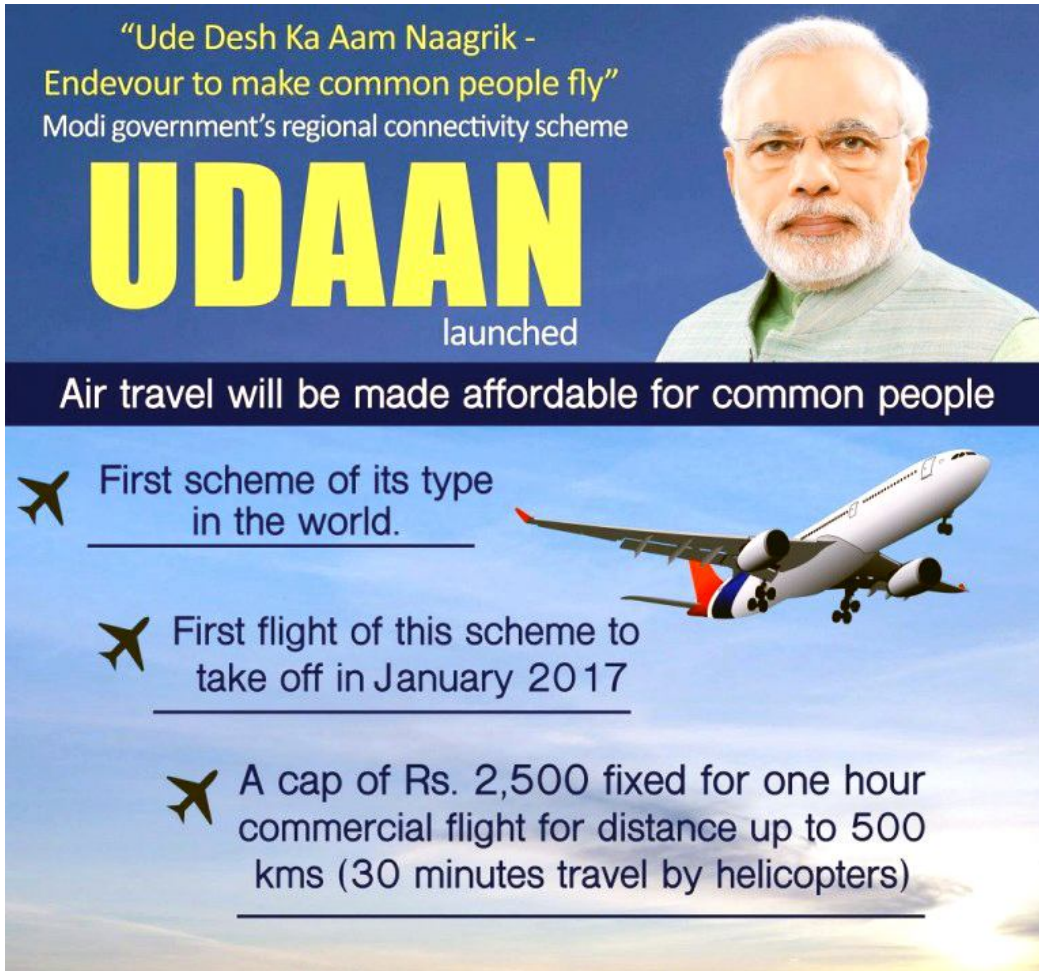
- Under the scheme, fifteen thematic circuits have been identified- Buddhist Circuit, Coastal Circuit, Desert Circuit, Eco Circuit, Heritage Circuit, Himalayan Circuit, Krishna Circuit, North East Circuit, Ramayana Circuit, Rural Circuit, Spiritual Circuit, Sufi Circuit, Tirthankar Circuit, Tribal Circuit, Wildlife Circuit.

UDAN SCHEME

Why in News

Ahead of UDAN Day (21st October), the Ministry of Civil Aviation flagged off 6 routes, expanding the aerial connectivity of North-East India, under the UDAN Scheme.

- The Government of India has acknowledged the contribution of the scheme and has identified 21st October as UDAN Day, the day on which the scheme document was first released.

"Ude Desh Ka Aam Naagrik - Endevour to make common people fly"
Modi government's regional connectivity scheme
UDAAN launched
Air travel will be made affordable for common people

- First scheme of its type in the world.
- First flight of this scheme to take off in January 2017
- A cap of Rs. 2,500 fixed for one hour commercial flight for distance up to 500 kms (30 minutes travel by helicopters)

KEY POINTS

Launch:

- Ude Desh Ka Aam Naagrik (UDAN) was launched as a Regional Connectivity Scheme (RCS) under the Ministry of Civil Aviation in 2016.

Objectives:

- To develop the regional aviation market.
- To provide affordable, economically viable and profitable air travel on regional routes to the common man even in small towns.

PM GATI SHAKTI SCHEME

- Recently, the government of India has launched the ambitious Gati Shakti scheme or National Master Plan for multi-modal connectivity plan, with the aim of coordinated planning and execution of infrastructure projects to bring down logistics costs.

KEY POINTS

- Aim: To ensure integrated planning and implementation of infrastructure projects in the next four years, with focus on expediting works on the ground, saving costs and creating jobs.
- The Gati Shakti scheme will subsume the Rs 110 lakh crore National Infrastructure Pipeline that was launched in 2019.
- Besides cutting logistics costs, the scheme is also aimed at increasing cargo handling capacity and reducing the turnaround time at ports to boost trade.
- It also aims to have 11 industrial corridors and two new defence
- It will help in fulfilling the ambitious targets set by the government for 2024-25, including expanding the length of the national highway network to 2 lakh kms, creation of more than 200 new airports, heliports and water aerodromes.
- **Integrated Approach:** It intends to bring together 16 infrastructure related Ministries.
- This will help in removing long-standing issues such as disjointed planning, lack of standardisation, problems with clearances, and to creation and utilisation of infrastructure capacities.

ENVIRONMENTAL AND ECOLOGY

APPLICATION ECOSYSTEM FOR INTEGRATION OF PROCUREMENT PORTALS

Why in News

Recently, the Department of Food and Public Distribution has developed an application ecosystem for integration of procurement portals of all state governments.

KEY POINTS

About:

- The Application Ecosystem will allow the integration of procurement portals of all state governments having Minimum Threshold Parameters (MTPs) for monitoring and strategic decision making.
- The introduction of MTPs in procurement operations are necessitated to avoid middlemen in procurement and ensure that farmers get the best value for their produce.
- MTPs will ensure uniformity and interoperability among the states.

- The MTPs are five key details which states are required to capture in their procurement portals, which are related to online registration, farmer data, digitized mandi and procurement, and billing.
- The integration of state portals with the central portal will go a long way in expediting the reconciliation of procurement figures with States and release of funds by the Centre Government to the States.

Need:

Challenges in Implementing Schemes:

- Due to variations in the procurement systems, there emerge both systemic and implementation challenges for implementing the schemes of the central government.

Delays in Funding:

- Reconciliation of the procurement operations with various states is sometimes a long-drawn exercise, leading to delays in the release of funds to states.

Inefficiencies:

- Moreover, the non-standard procurement operations also lead to avoidable inefficiencies, which manifest in the form of middlemen in the procurement operations.

Standardization:

- There is no pan-India standard procurement ecosystem for monitoring and strategic decision making.
- Standardization of the operations are essential in helping the country achieve greater levels of transparency and efficiency in procurement operations, which ultimately lead to ensuring food security for the people of the country.

Benefits:

- **Farmers:** Will be able to sell their produce at suitable prices and avoid distress sale.
- **Procuring Agencies:** With better management of procurement operations, the State agencies and Food Corporation of India will be able to procure efficiently with the limited resources at hand.
- **Other Stakeholders**: The automation andstandardization of procurement operations shall provide an integrated view of procurement of foodgrains and its storage in godowns.

DRAFT EPR NOTIFICATION: PLASTIC PACKAGING WASTE

Why in News

Recently, the Union Environment Ministry has come out with a draft notification for regulation of Extended Producer Responsibility (EPR) under Plastic Waste Management rules 2016

- The draft specifies the quantity of waste that will have to be managed by producers, importers and brand owners who generate plastic packaging waste in India.
- Earlier, the Ministry had notified the Plastic Waste Management Amendment Rules, 2021. These rules prohibit specific single-use plastic items which have "low utility and high littering potential" by 2022.

KEY POINTS

Producers' Mandate:

- It mandates producers of plastic packaging material to collect all of their produce by 2024 and ensure that a minimum percentage of it be recycled as well as used in subsequent supply.
- Producers of plastic will be obliged to declare to the government, via a centralised website, how much plastic they produce annually.

EPR Certificates:

- It has also specified a system whereby makers and users of plastic packaging can collect certificates - called EPR certificates - and trade in them.
- EPR means the responsibility of a producer for the environmentally sound management of the product (plastic packaging) until the end of its life.
- The certificates will help organisations in making up for their shortfall from other organisations that have used recycled content in excess of their obligation.

End-of-Life Disposal:

- Only a fraction of plastic that cannot be recycled - such as multi-layered multi-material plastics - will be eligible to be sent for end-of-life disposal such as road construction, waste to energy, waste to oil and cement kilns.
- The methods only prescribed by the Central Pollution Control Board (CPCB) will be permitted for their disposal.

Categorization of Plastic Packaging:

Rigid Plastic:

- They are plastic products that do not give easily when squeezed. Many are large, bulky items like lawn chairs, buckets, toddler toys etc.

Flexible Plastic:

- It includes packaging of single layer or multilayer (more than one layer with different types of plastic), plastic sheets and covers made of plastic sheet, carry bags (including carry bags made of compostable plastics), plastic sachet or pouches.

Multi-Layered Plastic Packaging:

- They are the plastics which have at least one layer of plastic and at least one layer of material other than plastic.

Targets:

Companies will have to collect at least:

- 35% of the target in 2021-22.
- 70% of the target by 2022-23.
- 100% of the target by 2024.
- In 2024, a minimum 50% of their rigid plastic will have to be recycled as will 30% of their category 2 and 3 plastic.
- Every year will see progressively higher targets and after 2026-27, 80% of their category 1 and 60% of the other two categories will need to be recycled.
- There are similar targets, with slight variations, for companies that use packaging material as well as import them.

Buying EPR Certificates:

- If entities cannot fulfil their obligations, they will on a "case by case basis" be permitted to buy certificates.
- The CPCB will develop a mechanism for such exchanges on a centralised online portal.

Non Compliance:

- Non-compliance, however, will not invite a traditional fine. Instead an environmental compensation will be levied, though the rules do not specify how much this compensation will be.

Fine:

- Entities that do not meet their targets or do not purchase enough credits to meet their annual target must pay a fine.
- Were they to meet their targets within three years, they stand to get a 40% refund. Beyond that, however, the money will be forfeited.
- Funds collected in this way will be put in an escrow account and can be used in collection and recycling/end of life disposal of uncollected and non-recycled/ non-end of life disposal of plastic packaging waste on which the environmental compensation is levied.

GRADED RESPONSE ACTION PLAN (GRAP)

Why in News

- Recently, the Commission for Air Quality Management (CAQM) has said that the measures under the "very poor" and "severe" category of the Graded Response Action Plan (GRAP) will kick in only when the air quality deteriorates further and stays in prescribed levels for 48 hours.

KEY POINTS

Graded Response Action Plan (GRAP):

About:

- In pursuant to the Supreme Court's order in the matter of M. C. Mehta vs. Union of India (2016) regarding air quality in the National Capital Region of Delhi, a Graded Response Action Plan has been prepared for implementation under different Air Quality Index (AQI) categories namely, Moderate & Poor, Very Poor, and Severe.
- A new category of "Severe+ or Emergency" has been added.
- The Plan was notified by the Ministry of Environment, Forests & Climate Change in 2017.
- It institutionalised measures to be taken when air quality deteriorates.
  - ✓ The plan is incremental in nature - therefore, when the air quality moves from 'Poor' to 'Very Poor', the measures listed under both sections have to be followed.
  - ✓ It prevents PM10 and PM2.5 levels from going beyond the 'moderate' national AQI category.

Implementation:

- Till 2020, the Supreme Court-appointed Environment Pollution (Prevention & Control) Authority (EPCA) used to order States to implement GRAP measures.
- The EPCA was dissolved and replaced by the Commission for Air Quality Management (CAQM) in 2020.
- CAQM is a statutory mechanism to coordinate and oversee diverse efforts to improve air quality in Delhi, Punjab, Haryana, Rajasthan and UP, with the underlying remedial approach.

| Category	Ambient Particulate Matter (PM) Concentration	Measures
Moderate to Poor	• PM 2.5 between 61-120 µg/m³ • PM10 between 101-350 µg/m³	• Enforce pollution control in thermal power plants • Mechanized sweeping on roads • Ban on firecrackers • Stop garbage burning
Very Poor	• PM2.5 between 121-250µg/m³ • PM10 between 351-430 µg/m³	• Stop use of diesel generator sets • Increase bus and metro services and increasing frequency of metro service • Stop use of coal/firewood in hotels and open eateries
Severe	• PM2.5 more than 250µg/m³ • PM10 more than 430µg/m³	• Increase frequency of mechanized sweeping of road and sprinkling of water on roads • Close brick kilns, Hot Mix plants, Stone Crushers • Shut down Badarpur power plant • Introduce concessional rates to encourage off-peak travel in public transport.
Severe+ or Emergency	• PM2.5 of or more than 300µg/m³ • PM10 of or 500µg/m³ **(persist for 48 hours or more)**	• Stop entry of diesel trucks into Delhi (except essential commodities) • Stop construction activities • Introduce odd and even scheme • Shutting of schools

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Other Measures:

- Environment Protection Charge (EPC): In 2016, the SC imposed an EPC of 1% on the sale of 2000cc and above diesel cars in Delhi and NCR.
- Environment Compensation Charge (ECC): In the year 2015, the SC imposed ECC on trucks entering Delhi.

INDIA'S ETHANOL PLAN AND FOOD SECURITY

Why in News

- India's ambitious plan to cut the use of fossil fuels by promoting ethanol derived from rice, corn and sugar could undermine its food security.

Crop → Fermentation → Purification → Ethanol → Blending → Transportation → Fuel Station
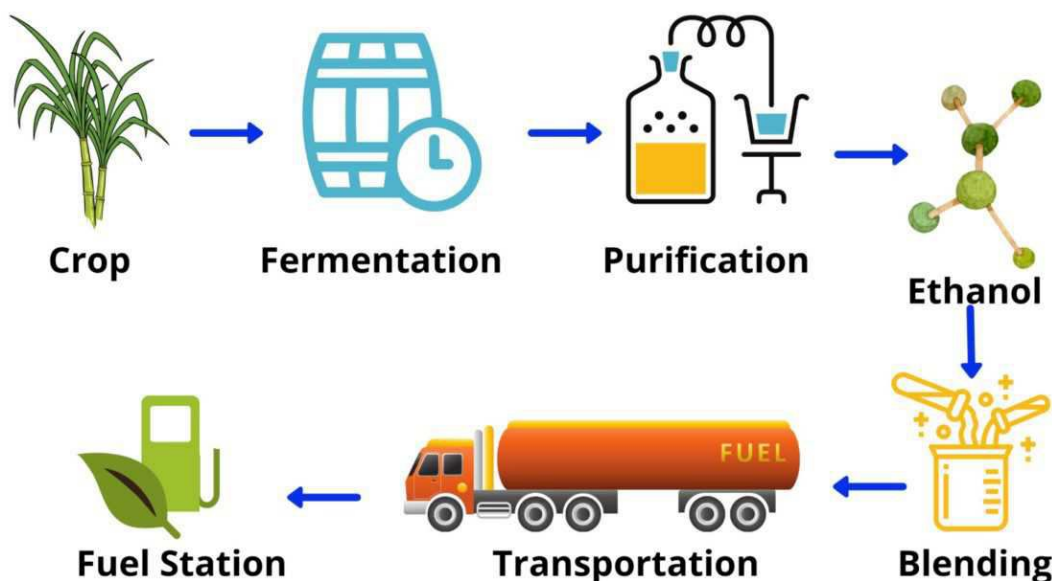
KEY POINTS

About:

- **Ethanol:** It is an agro-based product, mainly produced from a by-product of the sugar industry, namely molasses.
  - ✓ It is one of the principal biofuels, which is naturally produced by the fermentation of sugars by yeasts or via petrochemical processes such as ethylene hydration.
- **Ethanol Blending Programme (EBP):** It aims at blending ethanol with petrol, thereby bringing it under the category of biofuels and saving millions of dollars by cutting fuel imports and decreasing carbon emissions.

- **Blending Target:** The Government of India has advanced the target for 20% ethanol blending in petrol (also called E20) to 2025 from 2030.
  - ✓ Currently, 8.5% of ethanol is blended with petrol in India.

Associated Issues:

- **National Policy on Biofuel:** The new ethanol blending target primarily focuses on food-based feedstocks, in light of grain surpluses and wide availability of technologies.
  - ✓ The blueprint is a departure from the 2018 National Policy on Biofuels, which prioritized grasses and algae; cellulosic material such as bagasse, farm and forestry residue; and, items like straw from rice, wheat and corn.
- **Risk of Hunger:** The food grains meant for the impoverished are being sold to distilleries at prices cheaper than what states pay for their public distribution networks.
  - ✓ Competition between the distilleries and the public distribution system for subsidized food grains could have adverse consequences for the rural poor and expose them to enhanced risk of hunger.
  - ✓ India still ranks 94th on the Global Hunger Index 2020 comprising 107 nations.
  - ✓ The Food and Agriculture Organization (FAO) estimates that about 209 million Indians, or about 15% of its population, were undernourished between 2018 and 2020.
  - ✓ The Covid-19 pandemic is also pushing more people into poverty, dealing a blow to decades of progress.
- **Cost:** Production of biofuels requires land, this impacts the cost of biofuels as well as that of food crops.
- **Water use:** Massive quantities of water are required for proper irrigation of biofuel crops as well as to manufacture the fuel, which could strain local and regional water resources.
- **Efficiency:** Fossil Fuels produce more energy than some of the biofuels. E.g. 1 gallon of ethanol produces less energy as compared to 1 gallon of gasoline (a fossil fuel).

Government's Arguments:

- **Enough Stockpiles of Grains:** The push for ethanol poses no threat to India's food security because the government has enough stockpiles of grains at warehouses of the state-run Food Corporation of India (FCI).
  - ✓ State reserves stood at 21.8 million tons of rice, against a requirement of 13.54 million tons.

- **Capacity Creation:** The long-term planning of the government involves the creation of sufficient capacities so that half of the requirement of 20% blending is catered by grains, predominantly maize and the rest by sugar cane.
- **Benefit of Farmers:** The blending plan would benefit corn and rice farmers, while addressing the issue of surplus.

KUNMING DECLARATION ON BIODIVERSITY

Why in News

Recently, the Kunming Declaration was adopted by over 100 countries at the ongoing 15th Conference of the Parties to the United Nations Convention on Biological Diversity in china.

- The adoption of the declaration will create momentum for a new global biodiversity pact.
- In a previous agreement, Strategic Plan for Biodiversity 2011-2020, signed in Aichi, Japan, in 2010, governments agreed on 20 targets to try to slow biodiversity loss and protect habitats by 2020.

KEY POINTS

About:
- It calls for urgent and integrated action to reflect biodiversity considerations in all sectors of the global economy but crucial issues - like funding conservation in poorer countries and committing to biodiversity-friendly supply chains have been left to discuss later.
  - ✓ It is not a binding international agreement.
- It calls upon the parties to mainstream biodiversity protection in decision-making and recognise the importance of conservation in protecting human health.
  - ✓ The theme of the declaration is Ecological Civilization: Building a Shared Future for All Life on Earth.
- By adopting this, the nations have committed themselves to support the development, adoption and implementation of an effective post-2020 implementation plan, a capacity building action plan for the Cartagena Protocol on biosafety.
  - ✓ The Protocol seeks to protect biological diversity from the potential risks posed by living modified organisms resulting from modern biotechnology.
- As per the declaration the signatory nations will ensure that the post-pandemic recovery policies, programmes and plans contribute to the conservation and sustainable use of biodiversity, promoting sustainable and inclusive development.

RIGHT TO CLEAN ENVIRONMENT

Why in News

Recently, the United Nations Human Rights Council (UNHRC) unanimously voted for recognising a clean, healthy and sustainable environment as a Universal Human Right.

- If recognised by all, the right will be the first of its kind in more than 70 years since the Universal Declaration of Human Rights (UDHR) was adopted by the UN General Assembly in 1948.

- UDHR: The 30 rights and freedoms include civil and political rights, like the right to life, liberty, free speech and privacy and economic, social and cultural rights, like the right to social security, health and education, etc.

KEY POINTS

Background:

- The concept of human rights in general emerged after the Second World War (1939-45), but the right to a healthy environment, as one of those human rights, was never a priority.

- The right to a clean environment is rooted in the 1972 Stockholm Declaration, popularly called as the Magna Carta of human environment.
  - ✓ It contained principles and recommendations for environmental policy.

- Caring for the Earth 1991' and the 'Earth Summit' of 1992" also declared that human beings are entitled to a healthy and productive life in harmony with nature

HIGH AMBITION COALITION FOR NATURE AND PEOPLE

Why in News

Recently, India joined the High Ambition Coalition (HAC) for Nature and People.

- India is the first of the BRICS (Brazil, Russia, India, China and South Africa) to join the HAC.

KEY POINTS

About:

- It is an intergovernmental group championing a global deal for nature and people that can halt the accelerating loss of species, and protect vital ecosystems that are the source of our economic security.

- It was launched in 2019 by Costa Rica, France and Britain.
- It is co-chaired by Costa Rica and France and the Ocean co-chair belongs to the United Kingdom.

JAVAN GIBBON

Why in News

Indonesia is taking steps to protect the habitat of Javan Gibbon (Hylobates moloch), which is endangered by climate change and human encroachment.

- The species is also hunted for both meat and pet trade.

KEY POINTS

About:

- The silvery gibbon, also known as the Javan gibbon, is a primate. They are found in groups only, usually in a pair of two.
- It is endemic to the Indonesian island of Java, where it inhabits undisturbed rainforests up to an altitude of 2,450 m.

- It helps in regenerating forest vegetation by dispersing seeds.
- There are around 4,000 Javan gibbons left.
- It was declared Critically Endangered in 2004 but since has recovered to status of Endangered as per IUCN criterion. However, the latest IUCN estimate shows that their population is decreasing.

NEW TIGER RESERVE: CHHATTISGARH

Why in News

Recently, the National Tiger Conservation Authority (NTCA) has designated the combined areas of the Guru Ghasidas National Park and Tamor Pingla Wildlife Sanctuary as a Tiger Reserve.

- NTCA is a statutory body under the Ministry of Environment, Forests and Climate Change, established in 2005 for strengthening tiger conservation.

KEY POINTS

About:

- It is located in the northern part of Chhattisgarh, bordering Madhya Pradesh and Jharkhand.
- Approval was granted under Section 38V(1) of the Wildlife (Protection) Act, 1972.
- This will be the fourth Tiger Reserve in Chhattisgarh, after the Udanti-Sitanadi, Achanakmar, and Indravati Reserves.

HARA BHARA: AERIAL SEEDING CAMPAIGN

Why in News

Recently, Hara Bhara, India's first aerial seeding campaign in Telangana using the Seedcopter drone was launched.

- Earlier, in August 2015, Andhra Pradesh government had launched the aerial seeding programme using Indian Navy helicopters.

KEY POINTS

Hara Bhara Campaign:

- The idea of the campaign is to accelerate the mission of reforestation by planting one billion trees using drones by 2030 in the country.
- The project uses drones to disperse seed balls over thin, barren, and empty forest lands to turn them into lush green abodes of trees.
- The 'seedcopter' which is a drone developed by Marut Drones is an aerial seeding solution for rapid and scalable reforestation.

# MARINE PROTECTED AREAS IN ANTARCTICA

Why in News

India has extended its support for protecting the Antarctic environment and for co-sponsoring the proposal of the European Union for designating East Antarctica and the Weddell Sea as Marine Protected Areas (MPAs).

- The Southern Ocean, also called Antarctic Ocean, is a body of salt water covering approximately onesixteenth of Earth's total ocean area.

KEY POINTS

Marine Protected Areas:

- In general terms, a Marine Protected Area (MPA) is a marine area that provides protection for all or part of the natural resources it contains.
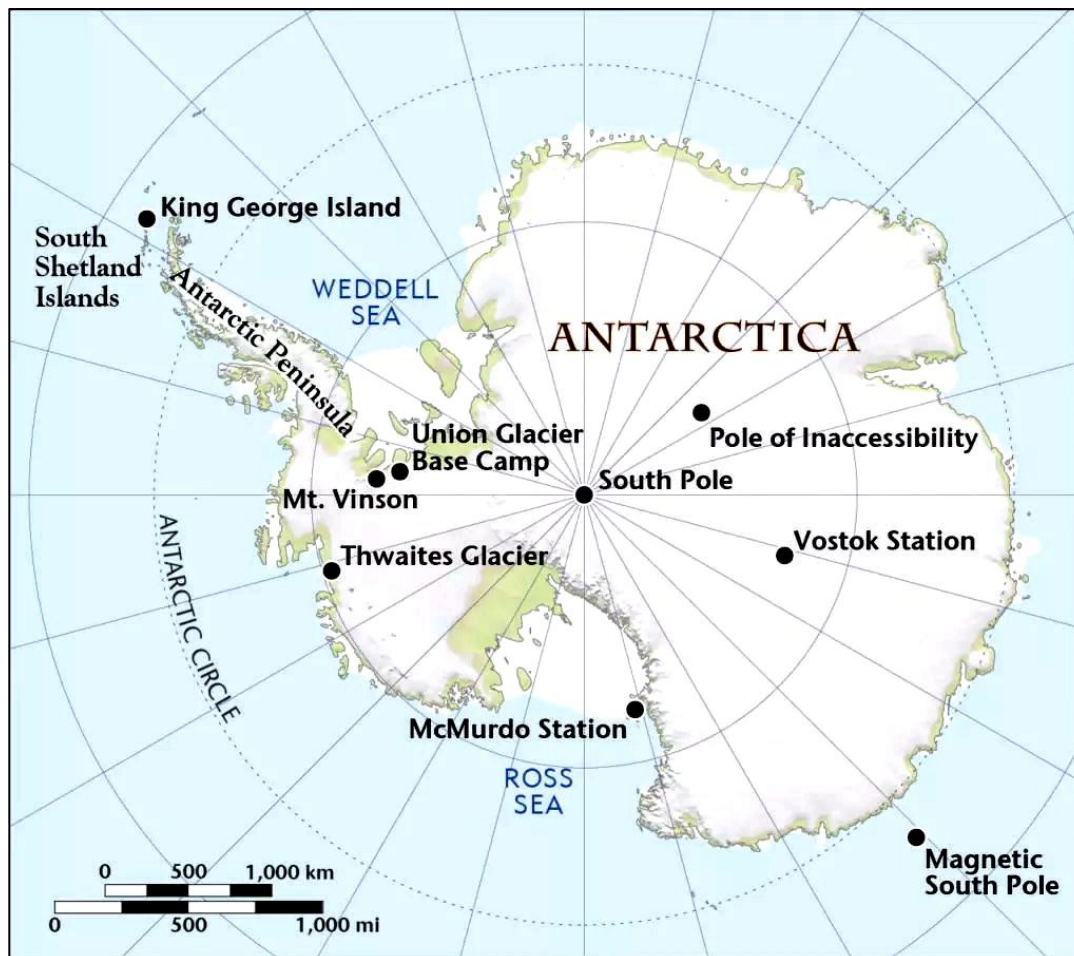
- Within an MPA, certain activities are limited, or entirely prohibited, to meet specific conservation, habitat protection, ecosystem monitoring or fisheries management objectives.

- MPAs do not necessarily exclude fishing, research or other human activities; in fact, many MPAs are multi-purpose areas.

- The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) has agreed a framework that describes the objectives and requirements for establishing MPAs.

COP26 CLIMATE CONFERENCE

Why in News

The COP 26 United Nations Climate Change Conference will be hosted by the UK from 31st october to 12th November.

- Earlier, Intergovernmental Panel on Climate Change (IPCC) published its assessment report on Earth's climate, highlighting heat waves, droughts, extreme rainfall and sea-level rise in the coming decades.

KEY POINTS

- COP 26 Goals: According to the United Nations Climate Change Framework Convention (UNFCCC), COP26 will work towards four goals:

Net Zero by 2050:

- To secure Global Net-Zero by Mid-Century and keep 1.5 Degrees within reach.
- Countries are being asked to come forward with ambitious 2030 emissions reductions targets that align with reaching net zero by the middle of the century.
- To deliver on these stretching targets, countries will need to:
  - ✓ Accelerate the phase-out of coal
  - ✓ Curtail deforestation
  - ✓ Speed up the switch to electric vehicles
  - ✓ Encourage investment in renewables.

WORLD METEOROLOGICAL CONGRESS 2021

Why in News

Recently, the World Meteorological Congress 2021 has endorsed a Water Declaration, including the Water and Climate Coalition.

- It has also approved a new vision and strategy for hydrology and an associated plan of action.

World Meteorological Congress

- The World Meteorological Congress is the supreme body of the World Meteorological Organization (WMO). WMO is a specialised agency of the United Nations for meteorology, operational hydrology and related geophysical sciences. India is a member. It produces annually the State of the Global Climate Report.

KEY POINTS

Concerns:

- Only 40% of countries globally have operational early flood and drought warning systems.
- Some 60% of WMO member countries lack hydrological monitoring capabilities. Globally, more than three billion people have no quality management system for their water-related data in place.
- It means close to half of the world's population is at risk due to a lack of information on the state of their water resources including rivers, lakes, groundwater, according to the most recent United Nation (UN) estimates.
- Some 107 countries are not on track to have sustainably managed water resources.

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INDIAN RAILWAY TO BE NET ZERO EMITTER BY 2030

Why in News

Recently, Indian Railways (IR) has announced that it is likely to become world's first 'net-zero' carbon emitter by 2030.

- IR is taking a multi-pronged approach to go green and decarbonise - from increasing its sourcing of Renewable Energy (RE) to electrifying its traction network and reducing its energy consumption.

KEY POINTS

About:

- **Indian Railways:** IR is the world's fourth largest railway network in terms of size. It is one of the largest electricity consumers in the country.
- **Passenger Services:** Transports 24 million passengers every day across the subcontinent on 13,000 trains covering approximately 67,956 km.
- **Freight Services:** 3.3 million tonnes of freight per day, and thus the fuel requirements are massive.
- **Contribution in Total Emissions:** India's transport sector contributes to 12% of the country's greenhouse gas emissions with the railways accounting for about 4% of these emissions.
- **Potential of Emissions Reduction:** The Indian Railways can raise the official target of 50% freight share by 2030, up from its current share of 33%.
  - ✓ By shifting freight to rail and optimising truck use, India can reduce logistics costs from 14-10% of Gross Domestic Product and carbon dioxide emissions by 70% by 2050 compared to a business-as-usual scenario.

E-WASTE GENERATION

Why in News

International E-Waste Day has been observed on 14th October since 2018.

- The aim of the day is to raise awareness about the millions of tonnes of e-waste generated worldwide each year, which has a negative impact on the environment and natural resources.
- Earlier this year, the Principal Bench of National Green Tribunal (NGT) issued directions for the implementation of E-Waste (Management) Rules, 2016.

KEY POINTS

E-Waste:

- E-Waste is short for Electronic-Waste and the term is used to describe old, end-of-life or discarded electronic appliances. It includes their components, consumables, parts and spares.
- It is categorised into 21 types under two broad categories:
  - ✓ Information technology and communication equipment.

International E-Waste Day

- This year's International E-Waste Day highlights the crucial role each of us play in making e-product circularity a reality.
- According to the United Nations, by 2021, each person on the planet would produce an average of 7.6 kg of e-waste, resulting in a global total of 57.4 million tonnes of e-waste.
- Only 17.4% of this electronic garbage, which contains a combination of hazardous compounds and valuable materials, will be appropriately collected, processed, and recycled.

REPORT

STATE OF CLIMATE SERVICES REPORT 2021: WMO

Why in News

Recently, the World Meteorological Organization (WMO) released the State of Climate Services report 2021. It focuses on Terrestrial Water Storage.

- Earlier, on water day (22nd March), in a report released by the United Nations Children's Fund (UNICEF), one in five children worldwide reside in areas of high or extremely high water vulnerability.
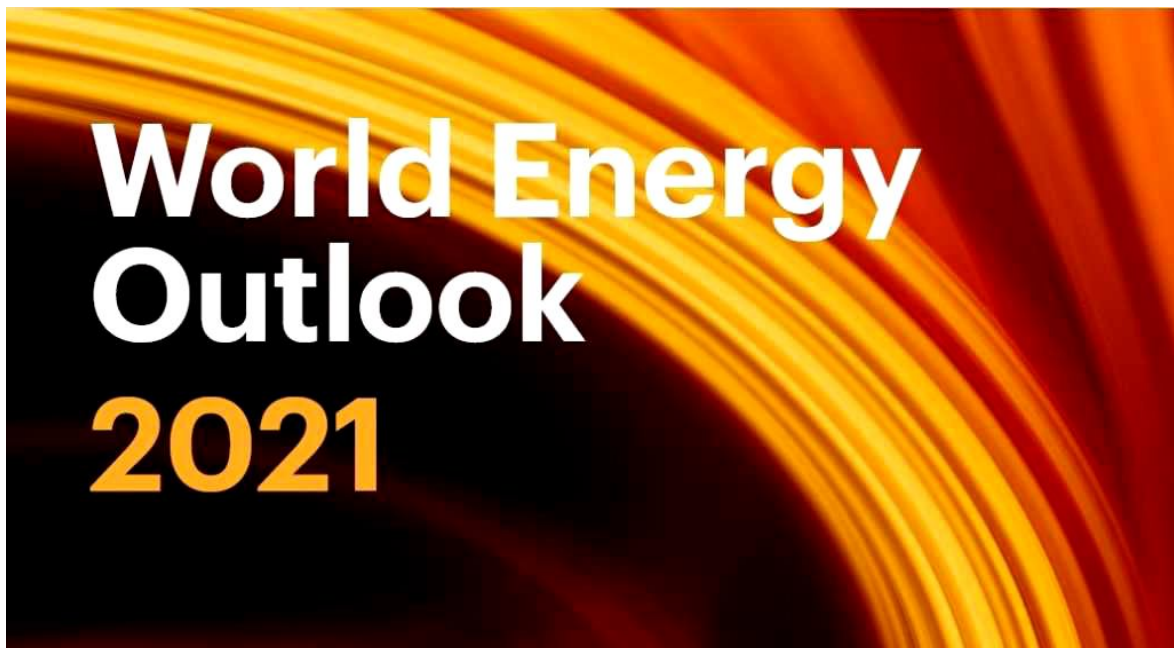
KEY POINTS

Terrestrial Water Storage (TWS):

- TWS is the sum of all water on the land surface and in the subsurface, i.e. surface water, soil moisture, snow and ice and groundwater.

✓ Water is a key prerequisite for human development. But only 0.5% of water on Earth is usable and available as freshwater.

- Water resources across the world are under tremendous pressure due to human and naturallyinduced stressors.

  ✓ These include population growth, urbanisation and decreasing availability of freshwater.

- Extreme weather events too have been responsible for the pressure on water resources realised across sectors and regions.

WORLD ENERGY OUTLOOK REPORT 2021: IEA

- Recently, the International Energy Agency (IEA) released the World Energy Outlook (WEO) Report 2021.

- Published every year, the WEO provides critical analysis and insights on trends in energy demand and supply.

- The 2021 report signaled pressure on governments to push for greater climate action at the Conference of Parties (COP26) summit (in Glasgow, UK).

- Earlier, IEA also released its Net Zero Emissions (NZE) Roadmap - named 'Net Zero by 2050'.

ECONOMY SCENARIO

COAL CRUNCH IN INDIA

Why in News

- India's thermal power plants are facing a severe coal shortage, with coal stocks having come down to an average of four days of fuel across an increasing number of thermal stations.

KEY POINTS

Reasons:

Eruption in Power Demand:

- Economy recovering from the Covid-19 pandemic coupled with supply issues have led to the current coal shortage.
- India is suffering from the impacts of a sharp surge in electricity demand, a squeeze on domestic mine output and surging prices of seaborne coal.

Increased Share of Thermal Power Plants:

- Coal fired thermal power plants have also supplied a higher proportion of the increase in demand leading the share of thermal power in India's power mix increasing to 66.4% from 61.9% in 2019.

Flooding and Rainfall:

- Lower than normal stock accumulation by thermal power plants in the April-June period and continuous rainfall in coal bearing areas in August and September which led to lower production and fewer despatches of coal from coal mines.

Lowering Imports:

- A consistent move to lower imports coupled with high international prices of coal have also led to plants cutting imports.

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Impact:

- If Industries face electricity shortages, it could delay India's economic reopening.
- Some businesses might downscale production.
- Providing India's population and underdeveloped energy infrastructure, the power crisis could hit long and hard.

Steps that can be Taken:

Ram-up Mining:

- Government is working to closely monitor stocks and also State run Coal India and NTPC are working to raise output from mines to boost supply.

Supply Controls:

- Rationing domestic power supplies, especially in rural and semi-urban areas, may emerge as one of India's easiest solutions.
- Indian power distributors do typically cut supplies to certain areas on a rotational basis when generation is lower than demand, and an extension of load-shedding would likely be considered if power plants take any further hits.

Increase Imports:

- India will need to amplify its imports despite the financial cost. From Indonesia for instance, the price rose from USD 60 per tonne in march to 200 per tonne in September.

Hydro-Power Generation:

- The same monsoon rains that have flooded coal mines are likely to boost hydro-power generation.
- Large hydro-electric projects on dams are India's major electricity source after coal and the sector performs at its peak around the rainy season which typically extends from June to October.

Turn to Natural Gas Powered Generators:

- There could be a larger role for natural gas to play, even with global prices currently surging.
- In a desperate situation, the gas-powered fleet could help prevent any widespread power outages. State-run generator NTPC Ltd., for example, has idle capacity that can be fired up in around 30 minutes if needed and is connected to a gas grid.

COAL

- This is the most abundantly found fossil fuel. It is used as a domestic fuel, in industries such as iron and steel, steam engines and to generate electricity. Electricity from coal is called thermal power.

- The coal which we are using today was formed millions of years ago when giant ferns and swamps got buried under the layers of earth. Coal is therefore referred to as Buried Sunshine.

- The leading coal producers of the world include China, US, Australia, Indonesia, India.

- The coal producing areas of India include Raniganj, Jharia, Dhanbad and Bokaro in Jharkhand.

- Coal is also classified into four ranks: Anthracite, bituminous, subbituminous, and lignite. The ranking depends on the types and amounts of carbon the coal contains and on the amount of heat energy the coal can produce.

'MAHARATNA' STATUS TO POWER FINANCE CORPORATION

Why in News

Recently, the government has accorded the 'Maharatna' status to state-owned Power Finance Corporation (PFC).

- An order to this effect was issued by the Department of Public Enterprises, under the Ministry of Finance.

- PFC has become the 11th public sector enterprise to get the 'Maharatna' status in the country and joins the ranks of other such companies like ONGC, Indian Oil Corporation, Steel Authority of India Limited (SAIL) and BHEL among others.

KEY POINTS

Maharatna" Status :

- The Maharatna dispensation was ushered in by the Union government for mega Central Public Sector Enterprises (CPSEs) to become global giants (introduced in 2010).
  - ✓ CPSEs are those companies in which the direct holding of the Central Government or other CPSEs is 51% or more.

- "Maharatna" status is granted to a company which has recorded more than Rs. 5,000 crore of net profit for three consecutive years, an average annual turnover of Rs. 25,000 crore for three years or should have an average annual net worth of Rs.15,000 crore for three years. It should also have global operations or footprints.

✓ A CPSE should also have a Navratna status, be listed on an Indian stock exchange.

✓ The Government has laid down criteria for grant of Maharatna, Navratna and Miniratna status to CPSEs.

Power Finance Corporation (PFC):

- Incorporated in 1986, PFC is the largest infrastructure finance company dedicated to the power sector under the administrative control of the Ministry of Power.

Significance of the Recognition:

Greater Financial and Operational Efficiency:

- PFC can invest up to Rs. 5,000 crore, or 15% of its net worth, in a single project apart from being granted enhanced powers by the government for undertaking mergers and acquisitions.
- Navratna and Miniratna CPSEs can invest up to Rs. 1,000 crore and Rs. 500 crore, respectively.
- The PFC Board can also structure and implement schemes relating to personnel and human resource management and training.

Offer Competitive Financing:

- Enable PFC to offer competitive financing for the power sector, which will go a long way in making available affordable & reliable 'Power For All 24×7'.

Push Government Agenda:

- The enhanced powers that come with Maharatna Status will also help PFC in pushing the government's agenda of funding under the National Infrastructure Pipeline, national commitment of 40% green energy by 2030 and effective monitoring and implementation of the new revamped distribution sector scheme with an outlay of more than Rs. 3-lakh crore.

AIR INDIA DISINVESTMENT

Why in News

Recently, the government approved the highest price bid of Talace Pvt Ltd, a wholly owned subsidiary of Tata Sons Pvt. Ltd for sale (Disinvesting) of 100% equity shareholding of Government of India in Air India (AI).

- The Tatas will own 100% stake in AI, as also 100% in its international low-cost arm Air India Express and 50% in the ground handling joint venture, AI SATS.

KEY POINTS

Tata in the sky | Tata Sons will be the new owner of debt-laden national carrier Air India. The sale marks the return of Air India to the Tata group, a pioneer in aviation

1932: JRD Tata pilots Tata Airlines' inaugural flight from Karachi to Bombay

1946: Tata Airlines becomes a public company; renamed Air India Limited

1948: Govt. of India acquires a 49% stake in the carrier

1953: Government nationalises Air India

2007: Air India merges with Indian Airlines, that operates only domestic routes

2012: Govt. approves ₹30,000 crore bailout for Air India, which has over ₹67,000 crore in debt

May, 2018: Govt. attempts to sell 76% stake in Air India; attracts no bidders

Jan, 2020: Govt. launches a second attempt, this time offers 100% stake in Air India

Oct, 2020: Govt.confirms Tata Sons' subsidiary Talace Pvt. Ltd. as the winning bidder

PM MITRA PARKS

Why in News

Recently, the Union Cabinet approved the setting up of seven Mega Integrated Textile Region and Apparel (PM MITRA) Parks at an outlay of Rs. 4,445 crore.

- The MITRA park aims to integrate the entire textile value chain from spinning, weaving, processing/dyeing, printing to garment manufacturing at one location.

KEY POINTS

About:

- PM MITRA park will be developed by a Special Purpose Vehicle which will be owned by the Central and State Government and in a Public Private Partnership (PPP) Mode.

- Each MITRA Park will have an incubation centre, common processing house and a common effluent treatment plant and other textile related facilities such as design centres and testing centres.

- The Master Developer will not only develop the Industrial Park but also maintain it during the concession period.

GREEN DAY-AHEAD MARKET

Why in News

Recently, the Union Minister of Power & New and Renewable Energy has launched the new market segment, Green Day Ahead Market (GDAM) at the Indian Energy Exchange.

- India is the only large electricity market in the world to implement a Green Day Ahead Market (GDAM) exclusively for renewable energy.

Indian Energy Exchange

- Indian Energy Exchange is the first and largest energy exchange in India providing a nationwide, automated trading platform for physical delivery of electricity, Renewable Energy Certificates and Energy Saving Certificates.

Day-Ahead Market (DAM)

- It is a physical electricity trading market for deliveries for any/some/all 15 minute time blocks in 24 hours of the next day starting from midnight.

Term-Ahead Market (TAM)

- The contracts under TAM cover a range for buying/selling electricity for duration up to 11 days.
- It enables participants to purchase electricity for the same day through intra-day contracts, for the next day through day-ahead contingency, on a daily basis for rolling seven days through daily contracts.

KEY POINTS

About:

- It is a marketplace for trading renewable power on a day-ahead basis.
- National Load Despatch Center (NLDC), Power System Operation Corporation Limited (POSOCO)   as the nodal agency has set up the requisite technologies and infrastructure for the launch of the GDAM.
- With GDAM, any renewable energy generating company can set up and sell renewable energy on the exchange.

GLOBAL AGRICULTURAL PRODUCTIVITY REPORT (GAP REPORT)

Why in News

According to a new report, Global agricultural productivity is not growing as fast as the demand for food, amid the impact of climate change.

The report was released in conjunction with the World Food Prize Foundation's annual conference.

KEY POINTS

Findings of the Report:

TFP Growth:

- Total Factor Productivity (TFP) is growing at an annual rate of 1.36% (2020-2019).
- This is below the Global Agricultural Productivity Index that has set an annual target of 1.73% growth to sustainably meet the needs of consumers for food and bioenergy in 2050.

Factors Responsible for Low TFP Growth:

- TFP growth is influenced by climate change, weather events, changes in fiscal policy, market conditions, investments in infrastructure and agricultural research and development.

G7 DIGITAL TRADE PRINCIPLES

Why in News

Recently, the Group of Seven (G7) wealthy nations agreed on a joint set of principles to govern cross-border data use and digital trade.

- The deal is a first step in reducing trade barriers, and could lead to a common rulebook of digital trade.
- Earlier, India attended the 47th G7 Summit as a guest country.

KEY POINTS

- Digital Trade: It is broadly defined as trade in goods and services that is either enabled or delivered digitally, encompassing activities from the distribution of films and TV to professional services.

G7 Digital Trade Principles:

- **Open Digital Markets:** Digital and telecommunications markets should be competitive, transparent, fair, and accessible to international trade and investment.
- **Cross Border Data Flows:** To harness the opportunities of the digital economy and support the trade of goods and services, data should be able to flow freely across borders with trust, including the trust of individuals and businesses.
- **Safeguards for Workers, Consumers, and Businesses:** Labour protections must be in place for workers who are directly engaged in or support digital trade, providing decent conditions of work.
- **Digital Trading Systems:** To cut red tape and enable more businesses to trade, governments and industry should drive forward the digitisation of trade-related documents.
- Fair and Inclusive Global Governance: Common rules for digital trade should be agreed and upheld at the World Trade Organization (WTO).
- These rules should benefit workers, consumers, and businesses in developing economies, as well as those in developed economies, while safeguarding each country's right to regulate for legitimate public policy objectives.

WORLD ENERGY OUTLOOK REPORT 2021: IEA

Why in News

Recently, the International Energy Agency (IEA) released the World Energy Outlook (WEO) Report 2021.

- Published every year, the WEO provides critical analysis and insights on trends in energy demand and supply.
- The 2021 report signaled pressure on governments to push for greater climate action at the Conference of Parties (COP26) summit (in Glasgow, UK).
- Earlier, IEA also released its Net Zero Emissions (NZE) Roadmap - named 'Net Zero by 2050'.

KEY POINTS

Increase Share of Renewables:

- Renewable energy sources, such as solar, wind, hydropower and bioenergy, need to form a far bigger share in the rebound in energy investment after the coronavirus pandemic.

- World is not investing enough to meet future energy needs, and the uncertainties are setting the stage for a volatile period ahead.

- Demand for renewables continues to grow. However, this clean energy progress is still far too slow to put global emissions into sustained decline towards net zero by 2050, which the IEA believes will help limit the increase in global temperatures to 1.5 degrees Celsius.

- Initially IEA supported continued investment in fossil fuels. However it has gradually moved toward a "more distinct tone urging decision makers to mitigate climate change".

WORLD BANK GDP PROJECTION FOR INDIA

Why in News

- According to the World Bank, India's economy, South Asia's largest, is expected to grow by 8.3% in the fiscal year 2021-22.

- The South Asia economic focus report projects the region to grow by 7.1% in 2021 and 2022. It is a biannual economic update presenting recent economic developments and a near-term economic outlook for South Asia.

- Other Major reports of the World bank include Human Capital Index, World Development Report. Recently, it has decided to discontinue the practice of issuing 'Doing Business reports'.