



# EXCEL QUEST

VOLUME - 35, NOVEMBER 2022



Meeting of the SCO Council of Heads



President Droupadi Murmu pays homage to Sardar Vallabhbhai Patel on his birth anniversary



Mission Karmayogi is the National Programme for Civil Services Capacity Building (NPCSCB).



5G services in India



Andhra SALT Project



Lead Poisoning Prevalence in India



Hughes-ISRO satellite internet service



Svante Pääbo receives Nobel Prize in Medicine

A Monthly Magazine from  
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## Director's Message

Dear Aspirants,

Britons have massive expectations and hope from their youngest PM Rishi Sunak in 200 years, but a sense of resentment also hovers over how the Indian-origin Tory candidate came to power without winning an election. His ascent to the post also was quite dramatic. The previous Prime Minister Liz Truss resigned within just 45 days after being elected, gaining the dubious distinction of being the shortest-serving Prime Minister in 300 years of British history. Her unplanned massive package of tax cuts led to the crashing of the Pound to an all-time low against the US Dollar. The appointment of her loyalists to the key posts in the new government did not augur well with her party members and her opponents. Her tenure also saw some high profile exits which dented her reputation even further.

Following her resignation, the Conservative party rallied for a fast track election where Rishi Sunak and Penny Mordaunt vied for the top post. As his rival withdrew from the race, Rishi Sunak was elected unopposed as the new leader of the Conservative party. It is a first in British history that the newly elected leader is even richer than the King of United Kingdom.

Sunak's journey is a classic example of that of British children of immigrant families. Both the British and the Indians identify with him. His aptitude and attitude were supported by the best of education. His alma mater includes Winchester College, Lincoln College at the Oxford University and the Stanford University. He went on to work as an analyst with Goldman Sachs and later co-founded his own hedge fund before joining politics.

The Sunaks' personal family history is a personification of the British dream: the idea that the UK is a land of opportunity where, no matter where you come from, if you work hard, you can make it right to the top. Simple hard work and determination are the only ingredients required for the formula to work.

Sunak is the third Prime Minister since the last election held in 2019. Boris Johnson won in 2019 with a large majority but had to resign in disgrace in the summer of 2022. The appointment of Sunak as PM without an election is due to the fact that the British Constitution rests on the Westminster model of government whereby the Party that commands a majority in the House of Commons forms the government. The PM is not directly elected by the people but is the one who is the leader of the Party of the government.



Political analysts argue that, though the Conservative party is legally permitted to govern for a further period of two years without calling for elections, it is legitimate only when it has the popular and implicit consent of the governed. The UK does not have a written constitution and it is difficult to decide when a government does or doesn't have legitimacy. So, the answer to whether Sunak can claim to have a political and moral legitimacy to continue will depend on his ability to unite his Party and end the political and economic uncertainty in UK.

Sunak, after being elected as the PM, announced that he wants to make India-UK relations a two-way exchange. He plans to open up easy access to students and companies in India to UK and vice-versa. A Free Trade Agreement between India and the UK would help bring down the current trade barriers and restrictions on transfer of goods. The UK's focus is to gain access to Indian markets for transport equipment, electrical equipment, medical devices, chemicals, motor vehicles and parts, wines, Scotch, and spirits, as well as some fruits and vegetables. India, on the other hand, wants to increase exports of Textiles, food and beverages, Pharmaceuticals, Tobacco, Leather and footwear, and Agricultural items like rice to the UK. Both sides are also aiming to expand digital cooperation and services under the FTA.

Best wishes,

Yours sincerely



K Rajendra Kumar IPS (Retd)

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## 1. NATIONAL

### 1.1 Issues and recent reforms in the Supreme Court

Chief Justice of India (CJI) has written to the government recommending his successor in the post, as per the convention of seniority, Justice D Y Chandrachud will take over as the next CJI. However, it will have an unusual collegium: instead of five members, it will have six.

#### What is a 5+1 collegium?

- Apart from CJI, there are 4 senior-most judges in the collegium system. Normally, the next CJI is among these four judges. However, this time, since Justice Chandrachud's tenure is for 2 years, the next potential CJI is not among the 4 senior-most judges. Therefore, to accommodate the next CJI in the collegium, the collegium is expanded to 5+1.

#### Collegium system:

- It is the system of appointment and transfer of judges that has evolved through judgments of the SC.
- **The SC collegium:** It is headed by the CJI and comprises four other senior-most judges of the court.
- **HC Collegium:** It is led by its Chief Justice and two other senior-most judges of that court.
- **Ordinarily case:** one of the four senior-most puisne Judges of the Supreme Court would succeed the Chief Justice of India
- **Situational:** If the situation is such that the successor Chief Justice is not one of the four senior-most puisne Judges, he must invariably be made part of the collegium.

#### Background of Collegium system:

1. **First Judges Case (1981):** It declared that the "primacy" of the Chief Justice of India (CJI)'s recommendation on judicial appointments and transfers can be refused for "logical reasons."
  - The ruling gave the Executive primacy over the Judiciary in judicial appointments for the next 12 years.
2. **Second Judges Case (1993):** SC introduced the Collegium system, holding that "consultation" really meant "concurrence".
  - It was not the CJI's individual opinion, consultation with the two senior-most judges in the SC.
3. **Third Judges Case (1998):** SC on President's reference expanded the Collegium to a five-member body, comprising the CJI and four of his senior-most colleagues.

#### Issues with the Collegium system:

- **Extra-constitutional or non-constitutional body:** brought in force by judgments of the Supreme Court.
- **No seat for Non-Judge:** There is no seat in the collegium for any non-judge neither from the executive, the Bar etc. This violates the principle of checks and balances.
- **Opaqueness:** lack of transparency as meetings are held behind closed doors.

- **Nepotism:** Scope for nepotism.
- **Overlooks talent:** Overlooks several talented junior judges and advocates.

#### **Issues with judicial appointments:**

- ‘Biased’ Collegium: Experts allege that successive collegiums not putting forth names disliked by the Government.
- No one from ‘distinguished’ Jurist: There have been no appointments from the category of distinguished jurists (under Article 124)
- Preserve of judges: Appointments to the top court seem to be the preserve of judges from the High Courts with a handful of appointments from the Bar.

#### **Steps taken in recent years:**

- Constitution benches: Five Constitution Benches were formed.
- Administrative changes: Transparent and prompt listing of cases
- All the judges get an opportunity to voice their opinion: Major decisions are taken now in the Supreme Court after full Court meetings.
- Live-streaming: Of Constitution Bench hearings. However, there are a few concerns:
- Almost 60 to 70 cases are listed before every Bench: It has raised questions about whether judges are able to cope with the work pressure.
- Sudden listing of cases, leads to less time for lawyers to prepare their briefs for their cases.

#### **Way forward**

- **Transparency:** There is a need to revisit this and secure a better, broad-based and transparent method of appointing senior judges to the High Courts and the Supreme Court.

### **1.2 Mission Karmayogi: An attempt to change the face of Civil Service**

“Mission Karmayogi” is a national programme for Civil Services Capacity Building (NPCSCB). It aims to transition civil services from ‘Rules based’ to ‘Roles based’ Human Resource (HR) Management by aligning work allocation of civil servants by matching their competencies to the requirements of the post, thereby leading to “an effective citizen-centric civil service”.

#### **Its features are**

1. ‘On-site learning’ to complement the ‘off-site’ learning to ensure a citizen-centric approach to governance.
2. Create an ecosystem of shared training infrastructure e.g. learning materials, institutions, and personnel.
3. Setting up an Integrated Government Online Training-iGOT Karmayogi Platform: to provide curated digital e-learning material for capacity building.
4. Using the “70-20-10” formula which means seventy per cent of adult learning comes from job experience, 20 per cent is a result of peer-to-peer sharing, and only 10 per cent comes from classroom teaching.

5. Creating a Dashboard view of Key Performance Indicators (KPI) at the iGOT portal for appropriate monitoring and evaluation of civil servants.
6. Accountability and Transparency in Governance: through real-time evaluation and constant training.
7. PM's Public Human Resources (HR) Council which will provide direction to the task of Civil Services reform and capacity building.
8. Collaborative and common ecosystem which will end the culture of working in silos, reduce duplication of efforts and bring out a new work culture that will focus on the individual as well as institutional capacity building.
9. Capacity Building Commission: will assist the PM Public Human Resources Council in approving the Annual Capacity Building Plans. E.g. Cross immersive learning for the ministry staff in the Civil Aviation Ministry's Annual Capacity Building Plan.
10. Public officials were sent to private airlines/airports to observe their managerial practices.
11. Ensuring efficient service delivery where work will be assigned as per specific role competencies (right man for the right job)
12. Bridging the gap between generalization and specialization which exists due to a lack of mid-level training at all levels.

### **1.3 Andhra's SALT project**

World Bank has provided the loan to Support Andhra's Learning Transformation (SALT) project. The project aims to transform the state's school education system by focusing on improving foundational learning, professional development of teachers, early childhood education etc.

### **1.4 Prime Minister's development initiative for Northeast region (PM-DevINE)**

PM-DevINE, was announced in the Union Budget 2022-23 to address development gaps in the North Eastern Region (NER).

#### **Objectives:**

1. Fund infrastructure convergently, in the spirit of PM Gati Shakti
2. Support social development projects based on needs of the NER
3. Enable livelihood activities for youth and women
4. Developmental gaps: Fill the development gaps in various sectors
5. Key Highlights: Efforts will be made to complete the PMDevINE
6. Projects Funding: It will have 100% Central funding.
7. Implementation: PMDevINE will be implemented by the Ministry of DoNER through the North Eastern Council or Central Ministries/ agencies.
8. End-to-end development: It will provide an end-to-end development solution instead of isolated projects.



9. No duplication of projects: It will ensure that there is no duplication of project support under PMDevINE with any of the other schemes of MDoNER or those of any other Ministry/ Department.

### **1.5 The World university rankings**

The Indian Institute of Science (IISc) has retained the top position among Indian institutes in the latest round of Times Higher Education (THE) rankings.

#### **Key Highlights:**

1. University of Oxford: Globally, it has emerged as the best institute among 1,799 universities from 104 countries, according to a statement issued by THE.
2. Boycott by IITs: THE ranking has been boycotted by most Indian Institutes of Technology (IITs) for the third consecutive year over transparency concerns.

#### **Parameters for ranking:**

Teaching (30%), Research (30%), Citations (30%), International outlook (7.5 %), Industry outcome (2.5 %). In teaching and research, 15% weightage each is based on a “reputational survey” Polity.

### **1.6 Why has the Election Commission frozen the Shiv Sena’s symbol?**

Recently The Election Commission barred the Shiv Sena factions led by former CM Uddhav Thackeray and current Maharashtra CM Eknath Shinde from using the party name and its election symbol.

#### **How are symbols allotted to political parties?**

##### **As per the guidelines, to get a symbol allotted:**

1. A party/candidate has to provide a list of three symbols from the EC’s free symbols list at the time of filing nomination paper
2. Among them, one symbol is allotted to the party/candidate on a first-come-first-serve basis.

#### **How does the ECI decide who gets the symbol?**

- Whenever parties split, there are chances of a dispute arising over claims to its election symbol. The ECI adjudicates the matter, using Para 15 of the Symbols Order, 1968.
- This decision is binding on them. This applies to disputes in recognized national and state parties. For splits in registered but unrecognized parties, the ECI usually advises the warring factions to resolve their differences internally or to approach the court.

### **1.7 No more prosecutions under Section 66A**

The Supreme Court ordered States and police forces to stop prosecuting free speech on social media under Section 66A of the Information Technology Act which was declared unconstitutional by the court in a judgment.

- **Section 66A:** It empowered police to make arrests over what policemen, in terms of their subjective discretion, could construe as “offensive” or “menacing” or for the purposes of causing annoyance, inconvenience, etc.
- It prescribed the punishment for sending messages through a computer or any other communication device like a mobile phone or a tablet, and a conviction could fetch a maximum of three years in jail.

### **1.8 Supreme Court delivers split verdict on Karnataka hijab ban**

The Supreme Court delivered a split verdict on whether Muslim students should shed their hijabs at their school gates.

- **Split verdict:** The split verdict means that the matter will now be placed before the Chief Justice of India for further directions
- **Ban to continue:** The ban on the hijab in Karnataka classrooms will remain in place. Justice H. Gupta upheld Karnataka’s prohibitive government order: Apparent symbols of religious belief cannot be worn to secular schools maintained from State funds.
- **Secularity’ meant uniformity:** manifested by parity among students in terms of uniformity.
- **Not amount to the denial of education:** However, if the students were refusing to attend classes, it would not amount to the denial of education by the state.

### **1.9 EC drops order to enrol outsiders in J&K**

The Jammu election officer has withdrawn an order directing tehsildars to enrol outsiders living in the Jammu district for over a year as voters for the upcoming assembly election.

#### **Why are electoral rolls being revised?**

- **Delimitation Commission:** The ECI is working on fresh electoral rolls in J&K after the J&K Delimitation Commission earlier this year carved out seven new Assembly constituencies in the UT, six going to the Jammu division and one to Kashmir, under the Jammu & Kashmir Reorganisation Act adopted in 2019. Jammu now has 43 seats against 47 in Kashmir.
- The ECI has decided that it will also include any person who has attained the age of 18 years on or before October 1, 2022, in the fresh electoral rolls. J&K has been under governor’s rule since 2018 and saw the last Assembly elections in 2014.

### **1.10 Amendments in the Multistate Cooperative Societies Act**

The Union Cabinet has approved the Multi-State Cooperative Societies (Amendment) Bill, 2022, which seeks to amend the Multi-State Cooperative Societies Act, 2002, to bring transparency in the sector and reform the electoral process.

#### **Key Highlights:**

- **97th Constitutional Amendment:** The Bill will incorporate the provisions of the 97th Constitutional Amendment.

- Improve the composition: It seeks to improve the composition of the board and ensure financial discipline
- **Rising of funds:** Enabling the raising of funds in the multi-state cooperative societies.
- **Setting up of:** Cooperative Election Authority, Cooperative Information Officer, and Cooperative Ombudsman
- The amendments have been introduced to: Improve governance, Reform the electoral process, Strengthen monitoring mechanisms, and Enhance transparency and accountability.

#### **97th Amendment Act:**

- Article 19(1) (c): The word “cooperatives” was added after “unions and associations” in Article 19(1) (c) under Part III of the Constitution.
- Article 43B: It was added in the Directive Principles of State Policy (Part IV) regarding the “promotion of cooperative societies”.

### **1.11 What is Interpol and what is its red notice?**

INTERPOL has rejected India’s request for red notice against Khalistan separatist Gurpatwant Singh Pannun (Canada-based founder and legal advisor of pro-Khalistan outfit Sikhs for Justice ) as there is not sufficient information.

#### **Reason behind request:**

1. Mr Pannun has been listed as a “terrorist” under Indian UAPA law. INTERPOL known as the ‘International Criminal Police Organisation’ is an international organization and a UN agency that facilitates worldwide police cooperation and crime control. Headquartered in Lyon, France.
2. It was formed in 1923.
3. India has been a member since 1956.
4. India’s Central Bureau of Investigation (CBI), is the national coordinating agency with INTERPOL.
5. RED NOTICE - It is a request to locate and provisionally arrest individual pending extradition. It is issued by the General Secretariat at the request of a member country or an international tribunal based on a valid national arrest warrant. Apart from ‘red notice’, INTERPOL also issues 7 other notices i.e - Black notice, yellow notice etc.

### **1.12 Auction under help**

Several Oil and Gas and coal-bed methane blocks were offered under the HELP auction.

#### **What is HELP?**

- The Hydrocarbon Exploration and Licensing Policy (HELP) replacing the erstwhile New Exploration Licensing Policy (NELP) was approved in March 2016. The main features of HELP are a Revenue Sharing Contract, single Licence for exploration and production of conventional as well as



unconventional Hydrocarbon resources, Open Acreage Licensing Policy (choice of blocks for investors), marketing & pricing freedom, no oil cess, year-round bidding, etc.

### 1.13 Rythu bharosa kendras (Andhra Pradesh)

Set up for the first time in the country, the RBKs are unique seed-to-sales, single-window service centres for farmers that have been set up across the state.

- RBKs facilitate interaction between farmers, agriculture scientists, and agriculture extension officers right at the village level.
- **Facilities:** sell pre-tested quality seeds, certified fertilisers, and animal feed, can hire farm equipment, give a sample for soil testing, process crop insurance, support systems of e-cropping, geo-tagging and even sell their produce at the prevailing MSP in the RBKs.

#### **Success:**

- Several farmers have changed their cropping patterns, and helped in the elimination of spurious seeds and uncertified and dangerous fertilisers. Over 10,700 RBKs multi-functional kiosks with digital Aadhar authentication equipment have been set up across the state. The Centre has recently nominated the RBK concept for the Food and Agriculture Organisation's "Champion" award.

### 1.14 Legal rights to nature

As the world fights climate change and the exploitation of nature, countries like Ecuador, Bolivia and New Zealand have awarded legal rights to natural entities.

- **Ecuador:** The first country in the world to recognise the rights of nature (in 2008). It granted tropical forests, islands, rivers and air, legal rights to "exist, flourish and evolve".
- April 2022: Ecuador became the first country to grant legal rights to individual wild animals.
- **Bolivia:** Bolivia granted all nature rights equal to that of humans in 2011. It established the Law of the Rights of Mother Earth, which redefined Mother Earth as "an indivisible community of all living systems and living organisms, interrelated, interdependent and complementary, which share a common destiny."
- **New Zealand's Whanganui River:** First in the world to be given legal status
- **India: Article 51-A (g):** It is the fundamental duty of every citizen to protect wildlife and have compassion for all living creatures. Uttarakhand High Court (2017), granted the river Ganga and its longest tributary Yamuna the legal right to be protected and not be harmed. However, SC stayed it due to various legal and administrative issues and said it was unsustainable.
- Wildlife Protection Act of 1972 and the Cruelty to Animals Act of 1960 do not recognize animals as individual living entities. A compelling shift from competition to cooperation between humans and living systems for future survival is currently an underexplored area, with the question of how India is preparing for the "bio age" still remaining.

**1.15 President of India Pays Homage to Sardar Vallabhbhai Patel on his Birth Anniversary**

The President of India, Smt Droupadi Murmu, paid homage to Sardar Vallabhbhai Patel on his birth anniversary at Rashtrapati Bhavan on October 31, 2022. The President and officials of Rashtrapati Bhavan paid floral tributes in front of a portrait of Sardar Vallabhbhai Patel. The President visited Sardar Patel Chowk in New Delhi, in the morning, to pay homage to Sardar Vallabhbhai Patel.

**1.16 Heads of Delegations of UN Security Council's Counter**

Terrorism Committee Call on the President Heads of Delegations of the United Nations Security Council's Counter Terrorism Committee (CTC) called on the President of India, Smt Droupadi Murmu at the Rashtrapati Bhavan today (October 29, 2022). They are in India to attend the Special Meeting of the UNSC CTC held in Mumbai and Delhi on 28-29 October, 2022.

- Welcoming the delegation members, the President appreciated their gesture of commencing their visit by paying tributes to the 26/11 victims in Mumbai. She said that India as the world's largest democracy, with one of the most open and diverse societies in the world, has been a victim of terrorism for decades. India has a national commitment to fight the evil of terrorism, in all its forms and manifestations. She emphasized that zero tolerance to all acts of terror, irrespective of its motivations, should continue to be the guiding approach of the international community in shaping the global counter terror architecture.
- During the meeting, Ambassador Ruchira Kamboj, Permanent Representative of India to the UN, in her capacity as Chair of the CTC, informed the President about the working of the UNSC CTC and its priorities. Mr Michael Moussa Adamo, President of the UN Security Council and Foreign Minister of Gabon and External Affairs Minister of India, Dr S. Jaishankar also made brief interventions apprising the President of the salient aspects of the UNSC CTC's deliberations and the way ahead, as outlined in the Delhi Declaration adopted earlier today.
- Among the dignitaries who attended the meeting were H.E. Ms Shirley Ayorkor Botchwey, Foreign Minister of Ghana, H.E. Ms Reem Ebrahim Al Hashimy, Minister of State for International Cooperation of UAE, and Ms Megi Fino, Deputy Foreign Minister of Albania. Senior officials of the United Nations, including Mr Vladimir Voronkov, Under Secretary General, United Nations Office for Counter Terrorism were also present on the occasion.

**1.17 Youth Delegation from Bangladesh calls on the President**

A youth delegation from Bangladesh called on the President of India, Smt Droupadi Murmu, at Rashtrapati Bhavan.

- Addressing the delegation members, the President said that they all are future leaders of Bangladesh. They are the custodians of the future of not only Bangladesh but also of the unique relationship of India

and Bangladesh. She expressed confidence that they will play a major role in the years to come in strengthening the relationship between the two countries.

- The President said that this visit is important as it continues the momentum from the last year's celebrations of the 50th anniversary of Liberation of Bangladesh, establishment of diplomatic relations between India and Bangladesh, and the birth centenary of Sheikh Mujibur Rahman, who is as much respected and remembered in India as in Bangladesh.
- The President said that India is proud to be a friend and partner in the Liberation War of Bangladesh and continues to share the development journey with Bangladesh. It is important for us to preserve this spirit, which continues to inspire the deep friendship between our two countries and our people. She said that Liberation of Bangladesh and its rise and prosperity is an inspiring story for the world community. Youth of Bangladesh have a past which is full of glory, and a future that is full of promises.
- The President said that Bangladesh occupies a very special place in the hearts and minds of every Indian. Our countries share deep civilizational links. We share many things between us including art, music and literature. She said that India has always attached the highest priority to its friendship with Bangladesh and we remain committed to realizing its full potential. Our deep cooperation shows the importance that both countries attach to this relationship. She recalled her recent meetings with Prime Minister Sheikh Hasina in Delhi and in London.
- The President stated that both India and Bangladesh have a large young population. More than half of India's population consists of young people and Bangladesh's demography is similar to ours, with a large youth population. She said that as innovators, creators, builders and leaders of the future, the youth of both countries need to engage in cutting-edge areas such as green energy, start ups and technology enabled services in finance, health and education.
- The President noted that while there is already a lot of people to people contact between India and Bangladesh, we need to do much more. In this regard, the youth of both countries can play a leading role. She expressed hope that the members of the delegation will use this opportunity to gain insights and experiences on various aspects of India, our diversity and the developments in areas pertaining to science, technology, arts etc. She said that just as youth of Bangladesh work hard to build the Sonar Bangla, they should also work with the same passion and sincerity to usher in a golden era of peace, prosperity and friendship among the people of India and Bangladesh.
- The Bangladesh Youth Delegation programme was started in 2012 as a joint initiative by the Ministry of External Affairs and Ministry of Youth Affairs & Sports. The main objective of this youth programme is to foster goodwill and understanding of each other's countries, promote exchange of ideas and understanding of values and culture among the youth.

**1.18 President of India launches 'HERSTART' – A start-up**

- Platform of Gujarat University for Women Entrepreneurs and Inaugurates/Lays Foundation Stone for various Projects of Government of Gujarat Related to Education and Tribal Development The President of India, Smt Droupadi Murmu, launched 'herSTART' – a start-up platform of Gujarat University in Ahmedabad today (October 4, 2022). She also inaugurated/laid the foundation stone virtually from Gujarat University for various projects of the government of Gujarat related to education and tribal development.
- Speaking on the occasion, the President said that it is a matter of pride for Gujarat University that not only Prime Minister, Shri Narendra Modi but also the father of India's space program, Dr. Vikram Sarabhai; former chairman of ISRO, Dr. K. Kasturirangan; and Union Home Minister, Shri Amit Shah are alumni of this university.
- The President said that it is natural for an institution which has alumni like Dr. Vikram Sarabhai, to be a pioneer in science, research and innovation. She noted that there are more than 450 start-ups working in the campus of Gujarat University. And more than 125 women-led start-ups are being actively supported by this university. Also around 15,000 women entrepreneurs are associated online or offline with this initiative. She said that she was happy to inaugurate a start-up platform dedicated to women entrepreneurs in such a start-up friendly university. She expressed confidence that this platform will not only boost innovation and start-up efforts of women entrepreneurs but also prove to be an effective platform in connecting women entrepreneurs with various government and private enterprises.
- The President said that she was also happy to inaugurate projects like Sainik School, Girls Literacy Residential School and Eklavya Model Residential School related to education, especially girls and tribal education in Gujarat. Because the foundation stone for further strengthening India's position in science, research and innovation will be built through school education.
- The President said that Gujarat has made remarkable progress in the field of education among other sectors. The school drop-out rate in the state has come down from 22 percent to 1.37 percent in the last two decades. The teacher-student ratio has also improved from 40 to 26. Today, through 'Vidya Samiksha Kendra', real-time monitoring of students and teachers is being done in about 55,000 schools, which is resulting in an increase in the learning outcome of the students. She noted that under the 'Mission School of Excellence', a target has been set to upgrade the infrastructure of about 20,000 schools in the state in the next five years.
- The President noted that Gujarat has also made significant progress in the field of higher education. While the number of colleges in the state was 775 in 2001-02, in 2020-21 this number increased to more than 3,100. India's first education quality and monitoring cell, 'Garima Cell' has been established in this state for evaluation of higher education. She said that with the effective implementation of 'Van

Bandhu-Kalyan Yojana', there has been a significant increase in the literacy rate in the tribal society. This scheme has also improved the school dropout rate among tribal students.

- The President said that Gujarat has been a leading state in the last two decades on many parameters of development. It has presented many benchmarks in the inclusive development of industry, innovation and infrastructure. The President said that every state has its own model of development which is determined by the resources and needs of the state. But the manner in which Gujarat has made all round progress, has shown the path of inclusive development to other states. She expressed confidence that India will secure its place as a developed country during Amrit-Kaal, if all states move forward by learning from each other and adopting their successful models.

### **1.19 President's message on the eve of Gandhi Jayanti**

- The President of India, Smt. Droupadi Murmu, has issued the following message to the nation on the eve of Gandhi Jayanti.
- In her message the President has said, "On the occasion of the 153rd birth anniversary of Mahatma Gandhi, I pay homage to the Father of the Nation on behalf of all fellow citizens. Gandhi Jayanti is an occasion for all of us to rededicate ourselves to the values of his inspiring life - peace, equality and communal harmony. Observing it this year assumes a special significance as the nation has been celebrating the Amrit Mahotsav, marking 75 years of Independence. This is the time, for all of us, to work towards the realisation of India of Gandhiji's dreams. A century ago, Gandhiji inspired millions with his call of Swadeshi and his stress on self-reliance. The making of an Atmanirbhar Bharat, which is under way, is, thus, inspired by the vision of the Mahatma and is intended as a true tribute to him. The India of his dreams is a clean India, a healthy India. The initiatives taken in this regard have been bearing fruits now.
- As we enter the Amrit Kaal, the period before the centenary of Independence, it is heartening to note that the young generation too has been taking inspiration from Gandhiji's works. When the world is going to face more and more complex challenges, his life continues to serve as a lighthouse, helping us negotiate the path amid turbulent waters.
- Gandhi ji showed to all humanity its true potential, and proved the power of compassion. Let us again take the pledge to walk on his path, the path of truth and non-violence, to promote mutual goodwill and to work towards the progress of the nation and the world".

### **1.20 President of India Presents Swachh Survekshan Awards 2022**

- The President of India, Smt Droupadi Murmu, presented the Swachh Survekshan Awards 2022 at a function held in New Delhi today (October 1, 2022).
- Speaking on the occasion, the President congratulated residents, sanitary workers and local administration of the award winning cities. She noted that Indore city has secured the first position for

the sixth time in a row. She said that other cities across the country can follow the model of people's participation adopted by the residents of Indore city.

- The President said that Swachh Survey is promoting healthy competition between states and cities for cleanliness. She noted that about nine crore people in more than 4000 cities have participated in this year's survey. She appreciated the Ministry of Housing and Urban Affairs for raising awareness about cleanliness among the citizens at a wider level.
- The President said that continuous efforts of central and state governments and all citizens in the last eight years are behind the success of 'Swachh Bharat Mission'. She said that our Safai Mitras have played the most important role in achieving this success. They worked continuously for maintaining cleanliness even during the COVID pandemic.
- The President said that on October 1st last year, the 'Swachh Bharat Mission-Urban 2.0' was launched with the aim to make all cities garbage-free by 2026. She was happy to note that from October 2, 2022, a campaign is being launched in cities to make all citizens aware of segregating wet and dry waste at home for better waste management. She said that keeping our streets, villages, localities and cities clean is the responsibility of all citizens. She urged all, especially the youth, to participate in this campaign and increase awareness about cleanliness in the society.



## 2. INTERNATIONAL RELATIONS

### 2.1 UN's 77th Anniversary

Recently, the World has celebrated the 77th anniversary of the United Nations(UN) on 24th October 2022.

#### What is the UN?

##### About:

- The United Nations (UN) is an international organization founded in 1945. It is currently made up of 193 Member States.
- Its mission and work are guided by the purposes and principles contained in its founding Charter and implemented by its various organs and specialised agencies.
- Its activities include maintaining international peace and security, protecting human rights, delivering humanitarian aid, promoting sustainable development and upholding international law.

##### History:

- In 1899, the International Peace Conference was held in The Hague to elaborate instruments for settling crises peacefully, preventing wars and codifying rules of warfare.
- It adopted the Convention for the Pacific Settlement of International Disputes and established the Permanent Court of Arbitration, which began work in 1902. This court was the forerunner of the UN International Court of Justice.
- The forerunner of the United Nations was the League of Nations, an organization conceived in circumstances of the First World War, and established in 1919 under the Treaty of Versailles "to promote international cooperation and to achieve peace and security." United Nations Conference on International Organization (1945).
- Conference held in San Francisco (USA), was attended by representatives of 50 countries and signed the United Nations Charter.
- The UN Charter of 1945 is the foundational treaty of the United Nations, as an intergovernmental organization.
- **Components:** All the 6 were established in 1945 when the UN was founded.
  - General Assembly
  - Security Council
  - Economic and Social Council
  - Trusteeship Council
  - International Court of Justice
  - UN Secretariat.
- **Funds and Programmes:**
  - United Nations Children's Fund (UNICEF)
  - United Nations Population Fund (UNFPA)

- United Nations Development Programme (UNDP)
- United Nations Environment Programme (UNEP)
- United Nations Human Settlements Programme (UN-Habitat)
- World Food Programme (WFP).
- **Specialized Agencies:**
  - Food and Agriculture Organization (FAO)
  - International Civil Aviation Organization (ICAO)
  - International Fund for Agricultural Development (IFAD)
  - International Labour Organization (ILO)
  - IMF
  - World Bank
  - International Maritime Organization (IMO).
  - International Telecommunication Union (ITU)
  - United Nations Educational, Scientific and Cultural Organization (UNESCO)
  - United Nations Industrial Development Organization (UNIDO)
  - World Health Organization (WHO).
  - UNCTAD.
  - United Nations Office on Drugs and Crime (UNODC)
  - United Nations High Commissioner for Refugees (UNHCR)
  - United Nations Economic and Social Commission for Asia and the Pacific (ESCAP).

### **What are the UN's Contributions so Far?**

#### **Increment in the UN membership:**

- Post- 1960's decolonisation, the membership of the UN expanded from about 50 members to double.

#### **Decolonisation:**

- It was the UN which played the lead role in the 1960 decolonisation and helped around 80 colonies in gaining their freedom.

#### **Involvement with Civil Society:**

- The UN is no more an organisation of nations only, more and more UN bodies have begun engaging with the people within the nations, experts, intellectuals and media with time.

#### **Better Sustenance:**

- The UN has successfully sustained itself till now, as compared to the League of Nations, which is an achievement.

#### **Peacekeeping:**

- The UN has successfully prevented World War - III.

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## **What are the UN's Major Setbacks?**

### **Arm Races and Cold War:**

- Although, the WW-III has been successfully prevented till date, violence, arm races, nuclear races and cold war's still occur among nations.

### **Power Suppressing Principles:**

- The world body still continues to see a tussle between 'principle' and 'power'. While the hopes of a peaceful and just world are represented by the UN, the most powerful states are privileged by granting them commanding heights over international politics via the undemocratic instruments of veto power and permanent seats in the UN Security Council (UNSC).

### **Not a Multipolar Organisation:**

- The UN has been unable to present itself as a multipolar and multilateral organisation. At the time of formation, the UN had 5 permanent members with a total of 51 members, presently, it has 193 members but permanent members in the UN General Assembly are still 5.

### **Laggard in Holistic Growth:**

- The organisation had not been able to cope up with the increasing globalisation. The UN has been a laggard in overall development; no institutional arrangement is there to deal in particular with Pandemics or new technologies such as Artificial Intelligence.

## **What is the Significance of India at UN?**

### **India and the UN:**

- India is one of the founding members of the UN. Since its independence and even before that, India has been an active participant in all initiatives undertaken by the UN like Millennium Development Goals, Sustainable development goals and various UN summits, including on climate change.

### **Maintaining peace:**

- As far as the peacekeeping ambit of the UN is concerned, India has performed quite well in maintaining peaceful and friendly relations with most of the nations.

### **India and UNSC:**

- India has been elected as a non-permanent member of the UNSC for two years in January 2021. The non-permanent membership of India can be taken as an opportunity to convince the like-minded nations for fighting international terrorism. Moreover, India should also focus upon sitting upon the apex body in future; becoming a permanent member of the UN.

### **Raising concern over need of reforms:**

- India has realised the urgent need of reforms in the UN specially at the UNSC and has raised concerns over the issue.

- Developing nations, including India, now play a larger role in both the international economy and politics. But these changes are not reflected in the UNSC, where all critical decisions are still being taken by the veto-wielding permanent members of the Security Council.
- The UN has survived and thrived and has certainly seen incremental changes over the last 75 years but the time has come for the UN to change and change for the better.
- UNSC is in desperate need to undergo reforms, the sooner the better, the later the more redundant.
- In a nutshell, as far as the whole UN is concerned complete reform is needed with principles not to be written by the most powerful anymore.

## 2.2 Ethiopia

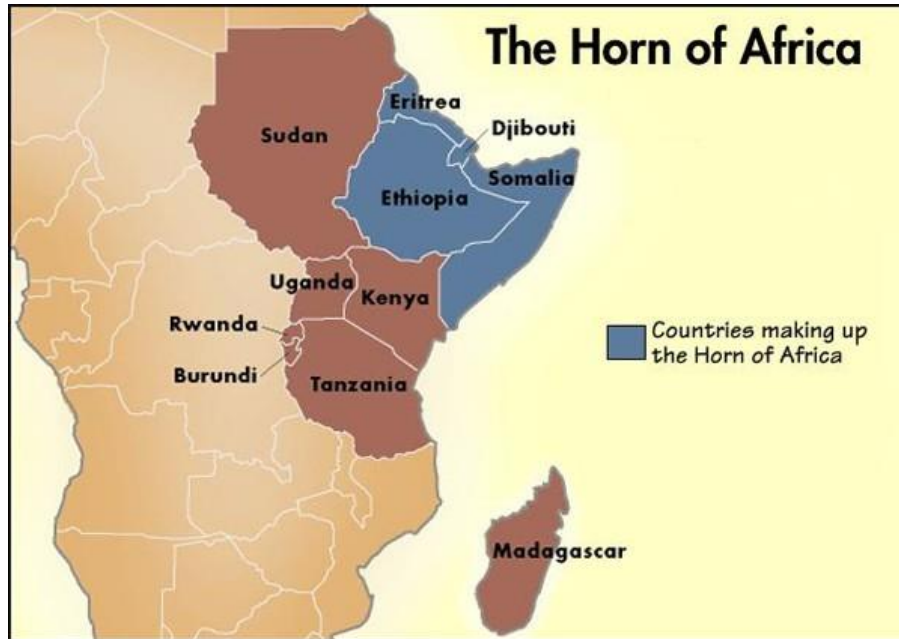
An Ethiopian government team and Tigray forces are going to have peace talks in South Africa.

### **What Paved to the Peace Talks?**

- The spectrum of political, economic and security problems that confronted Ethiopia and Eritrea paved the way for a strategy that essentially incorporated reconciliation and democratisation, social and economic development, and, importantly, ties with the western world.
- This is the first formal Peace talks between the two led by the African Union and is happening at a time when Ethiopian forces and allies have made some gains in Ethiopia's northern Tigray region.
- Tigray was a prominent force in the country's ruling coalition until Ethiopia's current leader and Nobel Peace laureate (2019) Abiy Ahmed became the Prime Minister in 2018.

### **Where is Ethiopia?**

- It is a landlocked country located in the Horn of Africa, officially known as the Federal Democratic Republic of Ethiopia.
- The country lies completely within the tropical latitudes and is relatively compact, with similar north-south and east-west dimensions.
- The capital is Addis Ababa.
- Ethiopia is one of the world's oldest countries, its territorial extent having varied over the millennia of its existence.
- It is the tenth-largest country in Africa in terms of area.
- Ethiopia is located from Sudan in the southeast, Eritrea to the south, Djibouti and Somalia to the west, Kenya to the north, and South Sudan to the east.
- It is the most populous landlocked country in the world.



### What is the Conflict in Ethiopia?

#### Background:

- Ethiopia was an imperial state that gradually weakened with the emergence of regional and religious rivalries.
- Currently Ethiopia has more than 70 ethnic groups. It has Oromo 34.5%, Amhara 26.91%, Somali 6.20%, Tigre 6.07%.
- A major insurgency followed in the 1970s — in Tigray, where the Meles Zenawi-led Tigray People's Liberation Front (TPLF), rebelled against the military government and its policies.
- It was the backing of the then Soviet Union and allies that propped up both the armed forces and the Mengistu government, but this support began to dissipate in the 1980s, influencing the course of conflicts with the Eritreans and Tigray.

#### Separation of Eritrea:

- Eritrea, formerly part of Ethiopia, separated from Ethiopia in 1991 and a majority of Eritrea was in the hands of the Eritrean People's Liberation Front (EPLF), while in Ethiopia it was the TPLF.
- The war between 1998 and 2000 and the border in Eritrea and Ethiopia remained tense until 2018.

#### Ethnic Rivalries:

- Abi Ahmed was elected to the post of Prime Minister in 2018 and signed a peace deal to end the border dispute with Eritrea.
- After the implementation of this peace agreement, Abi Ahmad was awarded the 2019 Nobel Peace Prize.
- But then the conflict started after Ahmed, who belongs to the Oroma community, was accused by local leaders of the Tigray community that the community was being harassed by military officials and bureaucrats.

- The original inhabitants of Tigray are considered to be the fighting community of Ethiopia and 60% of senior military positions are dominated by the Tigray community.

**Civil War:**

- Along with this, various international agencies have accused Abi Ahmad of imposing an internet shutdown to curtail press freedom in Ethiopia and curbing personal rights. As a result of Abi Ahmad's policies, the dissatisfaction of the Tigray community increased and there was a situation of civil war.
- Missiles were fired by the Tigray army in the neighboring country of Eritrea, Asmara, after which the Federal Government of Ethiopia declared an armed struggle against the Tigray Army (Tigray People's Liberation Front).

**What are the Implications of this Conflict?****Impact on Neighboring Countries:**

- Ethiopia is the region of the Horn of Africa which has countries like Eritrea, Djibouti, and Sudan in addition to Ethiopia. The launch of missiles at the capital of Eritrea by the Tigray community of Ethiopia also makes other countries suspicious.

**Hydro Project on the Blue Nile:**

- Tigrayan tensions are also linked to the mega hydroproject on the Blue Nile, the 6,450 MW Grand Ethiopian Renaissance Dam, which will be Africa's largest hydroelectric facility.
- It is a few hundred kilometres away from the Tigrayan border and upstream and east of the border with Sudan.
- There is a threat of regional disquiet with Sudan and Egypt which depend on the Nile and fear restrictions to water use.

**Global Impact:**

- Global organizations are also affected by this conflict. Recently the President of the World Health Organization has condemned the conflict in Ethiopia.
- The conflict with Tigray worries the world as it could spill beyond the borders and ignite a crisis in north-east Africa.

**Impact on India:**

- India considers Africa as an important part of its diplomacy at this time. Various types of welfare programs are being run by India in African countries. Educational work and industrial work are done by Indians in Ethiopia.

**How have been the India-Ethiopia Relations?**

- Ethiopia is one of the largest recipients of long-term concessional credit from India in Africa.



- Lines of Credit worth more than USD1 billion have been sanctioned to Ethiopia for sectors such as rural electrification, sugar industry and railways.
- Tele-Education and Tele-Medicine services under the Pan African e-network Project was launched in Addis Ababa in July 2007.
- The Tele-Education project has been replicated by the Ethiopian side and linkages established between the Addis Ababa University and the Indian Institutes of Technology at Delhi and Kanpur.
- Bilateral trade between Ethiopia and India stood at USD 1.28 billion in 2018-19, out of which Indian exports to Ethiopia were USD 1.23 billion and imports were USD 55.01 million.
- There are more than 586 Indian companies in Ethiopia employing more than 55,000 people with licensed investment of over USD 4 billion.
- About 58.7% of Indian investments are in the manufacturing sector, followed by agriculture (15.6%).
- Indian Mission has been celebrating the International Day of Yoga in Addis Ababa. Mission held Gandhi@150 celebrations in Addis Ababa (Oct 2020).

### **Way Forward**

- Abiy can reach out to regional political leaderships, especially the TPLF, find common ground, and run the country peacefully by restoring the balance between ethnicities and regions and decentralising the federal government.
- The protection of civilian safety and security is essential. The African Union can play a role in this.

### **2.3 Meeting of the SCO Council of Heads**

Recently, China hosted a meeting of the Shanghai Cooperation Organisation (SCO) Heads of Government

- The SCO Heads of Government meet is held annually to focus on the trade and economic agenda of the organisation and approves the SCO's annual budget.
- India has taken over as Chairperson of the SCO for 2023, and will host leaders of all SCO countries at a summit in Delhi expected in mid-2023.
- Earlier, the SCO summit 2022 was held recently in Samarkand, Uzbekistan.

### **What are the Highlights of the Meeting?**

- The heads of delegations of the SCO member states exchanged views on key issues of global and regional development, discussed priority steps to increase trade, economic, cultural, and humanitarian cooperation within the SCO.
- India stated that its total trade with SCO Members is only USD 141 billion, which has potential to increase manifold.
- The bulk of India's trade with SCO countries is with China, which crossed USD 100 billion in 2022, while trade with Russia is less than USD 20 billion.
- Trade with Central Asian countries is less than USD 2 billion, and with Pakistan it is about USD 500 million.

- While taking aim at China's BRI (Belt and Road Initiative), which passes through parts of Pakistan occupied Kashmir (PoK), India said that Connectivity projects should respect the sovereignty and territorial integrity of Member States and respect international law.
- India underlined the need for better connectivity in the SCO region built on the centrality of interests of Central Asian states, which will unlock the economic potential of this region in which Chabahar port and the International North South Transport Corridor (INSTC) could become enablers.
- India drew attention to its commitment in fighting the challenge of climate change and also, its achievements made in this direction.
- India pitched for more trade through Iran's Chabahar port and the INSTC that India is a part of, aiming to improve bilateral trade with Central Asian countries.
- A joint communique was issued after the meeting naming all countries except India, which reaffirmed their support for the BRI, "including the work to promote the alignment of the 'Belt and Road' construction with the construction of the Eurasian Economic Union".

### **What is the Shanghai Cooperation Organisation?**

#### **About:**

- It is a permanent intergovernmental international organisation. It was created in 2001. The SCO Charter was signed in 2002, and entered into force in 2003.
- It's a Eurasian political, economic and military organisation aiming to maintain peace, security and stability in the region.
- It is seen as a counterweight to North Atlantic Treaty Organization (NATO), It is a nine- member economic and security bloc and has emerged as one of the largest transregional international organisations.

#### **Official Languages:**

- Russian and Chinese.

#### **Permanent Bodies:**

- SCO Secretariat in Beijing. Executive Committee of the Regional Anti-Terrorist Structure (RATS) in Tashkent.

#### **Chairmanship:**

- It is by rotation for a year by Member States.

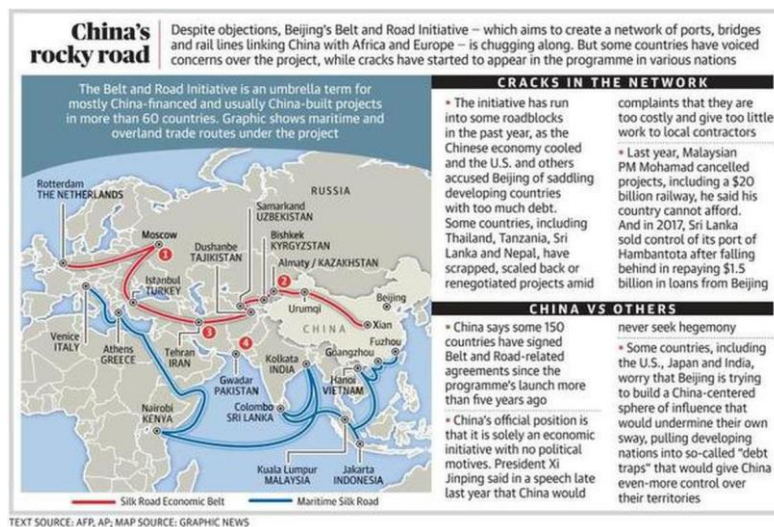
#### **Genesis:**

- Prior to the creation of SCO in 2001, Kazakhstan, China, Kyrgyzstan, Russia and Tajikistan were members of the Shanghai Five.
- Shanghai Five (1996) emerged from a series of border demarcation and demilitarization talks which the four former Soviet republics held with China to ensure stability along the borders.

- Following the accession of Uzbekistan to the organisation in 2001, the Shanghai Five was renamed the SCO.
- India and Pakistan became members in 2017.
- Current Members: Kazakhstan, China, Kyrgyzstan, Russia, Tajikistan, Uzbekistan, India and Pakistan.
- Iran is set to become a permanent member of the SCO in 2023.

### What is Belt & Road Initiative (BRI)

- Belt & Road Initiative (BRI) is an ambitious project that focuses on connectivity and cooperation among multiple countries spread across the continents of Asia, Africa, and Europe. BRI spans about 150 countries (China's Claim).
- Initially announced in the year 2013, the project involves building networks of roadways, railways, maritime ports, power grids, oil and gas pipelines, and associated infrastructure projects.
- The project covers two parts.
- **Silk Road Economic Belt:** It is land-based and is expected to connect China with Central Asia, Eastern Europe, and Western Europe.
- **21st Century Maritime Silk Road:** It is sea-based and is expected to connect China's southern coast to the Mediterranean, Africa, South-East Asia, and Central Asia.



## 2.4 India Abstains Russia's UNSC Resolution on Bio weapons

India has abstained from a UNSC resolution sponsored by Russia alleging US and Ukraine carrying out "military biological activities" violating the Biological Weapons Convention (BWC).

- Before this resolution, India recently abstained from another UNSC resolution, which sought to declare Russia's annexation of four Ukrainian territories as invalid.

### What is the Biological Weapon Convention?

#### About Biological Weapons:

- Biological weapons use microbiological agents (such as bacteria, viruses or fungi) or toxins to intentionally cause death or harm to humans, animals, or plants.

**Biological Weapon Convention:****About:**

- Formally known as “The Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction”, the Convention was negotiated by the Conference of the Committee on Disarmament in Geneva, Switzerland.
- It entered into force on 26th March 1975.

**Ambit:**

- It effectively prohibits the development, production, acquisition, transfer, stockpiling and use of biological and toxin weapons.

**Significance:**

- It is a key element in the international community’s efforts to address the proliferation of the Weapons of Mass Destruction (WMD).
- It was the first multilateral disarmament treaty banning an entire category of WMD.
- It supplements the 1925 Geneva Protocol, which prohibited only the use of biological (and chemical) weapons in war.
- The Geneva Protocol was signed at a conference held in Geneva under the auspices of the League of Nations.
- It entered into force in 1928. India has ratified this protocol.

**Members:**

- The Convention has an almost universal membership with 184 States Parties and four Signatory States.
- India is a signatory of the convention.

**What are UN Resolutions?****About:**

- The UN Resolutions and decisions are formal expressions of the opinion or will of UN organs.
- The nature of the resolution determines if it is considered binding on States.
- UNGA Resolutions: Articles 10 and 14 of the UN Charter refer to General Assembly resolutions as "recommendations". The recommendatory nature of UNGA resolutions has repeatedly been stressed by the International Court of Justice. However, some UNGA resolutions dealing with matters internal to the United Nations, such as budgetary decisions or instructions to lower-ranking organs, are clearly binding.
- UNSC Resolutions: In general, resolutions adopted by the UN Security Council acting under Chapter VII of the Charter, are considered binding, in accordance with Article 25 of the Charter.
- However, they are subject to veto exercised by permanent members of UNSC.

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## **What has been India's Stand on Previous UN Resolutions Involving Russia and Ukraine?**

### **India has abstained from the following UN Resolutions:**

- US-sponsored UNSC resolution that deplored in the strongest terms Russia's aggression against Ukraine. Russia drafted UNSC resolution on the Humanitarian situation in Ukraine calling for a negotiated ceasefire for enabling safe, rapid, voluntary and unhindered evacuation of civilians. Resolution passed at the UN Human Rights Council to set up an international commission of enquiry into Russia's actions in Ukraine. UNGA resolution that censured Russia for its military actions in Ukraine.
- There were 34 other nations that abstained from this resolution including China, Pakistan, Bangladesh and Sri Lanka, besides Central Asian and some African countries.
- International Atomic Energy Agency (IAEA) resolution related to safety at four nuclear power stations and a number of nuclear waste sites including Chernobyl, as the Russians seized control of them.

## **2.5 Global Energy Equity**

In the run-up to the Climate Change Conference (COP26), last year in Glasgow, several developed countries had declared their intention to reach net-zero emissions by 2050. These declarations did not square with the requirements of "keeping 1.5°C alive".

- Four-fifths of the global carbon budget has already been exhausted. Developed countries are responsible for more than half of global CO<sub>2</sub> emission. But global energy poverty is concentrated in developing countries.
- Also, the average per capita energy use of the richest 20 countries is 85 times higher than that of the 20 poorest countries.
- In this background, COP27 affords a critical moment to acknowledge and address the concerns surrounding energy access and curb energy inequality.

### **What is Energy Poverty?**

- According to the World Economic Forum, Energy Poverty is the lack of access to sustainable modern energy services.
- It can be found in all conditions where there is a lack of adequate, affordable, reliable, quality, safe and environmentally sound energy services to support development.
- The International Energy Agency (IEA) estimates that around 2 billion people worldwide experience energy poverty.

### **How does Energy Inequality Relate to the Global Order?**

- Energy inequality burdens the global south disproportionately.
- Poor and vulnerable communities in the energy-importing countries of the global South suffer the most.
- Almost 90 million people in Asia and Africa, who gained access to electricity recently, cannot afford to pay their energy bills. The reality of global inequality was acutely evident during the COVID-19

pandemic. Several countries in Africa, Asia and Latin America are facing severe agricultural and industrial slowdowns in the post-pandemic period.

- At a time when the language of energy poverty and security is re-entering the northern vocabulary, it is time to call out the hypocrisy of the advice on fossil use and import of fuel given by the North to some of the world's poorest regions

### **What is Energy Hypocrisy of Global North?**

- **Commitment to Decarbonization:** 30 years after acknowledging the problem of anthropogenic global warming and committing in the United Nations Framework Convention on Climate Change (UNFCCC), to take the lead in climate change mitigation, the level of decarbonisation in the global North has not matched the expectations. In the United States alone, 81% of primary energy is from fossil fuels. Additionally, in 2022, even coal consumption in the U.S. and the EU is estimated to increase by 3% and 7%, respectively.
- **Europe's Accusation:** As part of the current global order, Europe accused India of "funding war" in the name of acquiring oil from Russia during the Russia-Ukraine war. **Europe's Energy Consumption:** In Europe, fossil fuels constitute 76% of the energy consumption (coal, oil, and natural gas contribute 11%, 31%, and 34% respectively).
- **The Nord Stream 1 pipeline** supplies European Union states with about 35% of all the gas they import from Russia.
- **Bottom Line:** In response to the accusation, the Government of India responded in the following manner.
- If European states manage energy deals in a way that has an impact on their economy, that freedom or choice should exist for other countries as well. India is working to get the best deal for its citizens amid intense volatility in global energy markets and "no political messaging should be attached to this."

### **What are the Challenges Related to Energy Security of India?**

- **High Dependence on Imports:** With its growing dependency on imported oil, India's energy security is under severe strain, and the current disrupted global supply chain is compounding the problem.
- **Delayed Domestic Production:** Coal, oil, and natural gas are the most important sources of energy in India. A major reason for inadequate domestic supply is delays related to regulatory and environmental clearances (Mining of coal is most affected by this).
- **Affordability Concern:** India ranks low in affordability of petrol, notwithstanding the claims of high subsidies to oil. High prices of petroleum products directly contribute to higher retail inflation.
- Diesel prices account for 60-70% of the freight cost in India. Higher cost of freight contributes to price rise for products in every sector.



### **What should be the Way Forward?**

- Shifting the Focus towards Renewable Energy Sources: Energy generated from renewable sources is cleaner, greener and more sustainable.
- In addition to contributing to low-carbon development strategies, renewable energy projects can create employment opportunities for India's workforce.
- Energy Awareness: It is important to organise energy campaigns that promote green energy and to raise awareness of efficient energy consumption at the lowest possible level.
- Translating Goals into Implementable Action: To achieve the sustainable development goals like zero hunger, zero malnutrition, zero poverty, and universal well-being, energy security will be crucial.
- To properly implement energy sustainability, technology options for effective utilisation of energy resources should be considered. Also, there is a need to set up a monitoring mechanism at the local level to oversee implementation of policies in true spirit.
- Towards Global Energy Equity: The question of inequality in energy access should be raised squarely at the centre of all discussion in COP27. As the strapline for COP27 (“Together for Implementation”) suggests working together with burden sharing and differentiated but significant responsibilities according to respective capabilities of different countries.
- Global intergovernmental organisation should be established dedicated to just energy transition, energy access and energy justice to move towards energy equity.

### **2.6 Nord Stream Pipeline**

Recently, leaks were found in the pipelines comprising the Nord Stream pipelines (Nord Stream 1 and Nord Stream 2) located near Denmark and Sweden.

- The leaks happened just before the ceremonial launch of the Baltic Pipe carrying gas from Norway to Poland, which is an effort by Poland to decrease its dependence on Russia for energy.

### **What are the Nord Stream Pipelines?**

- Nord Stream consists of two pipelines, which have two lines each. Nord Stream 1 is a 1,224 km underwater gas pipeline running from Vyborg in northwest Russia to Lubmin in northeastern Germany via the Baltic Sea. It was completed in 2011. Nord Stream 2 which runs from Ust-Luga in Leningrad to Lubmin was completed in September 2021 and has the capacity to handle 55 billion cubic meters of gas per year once it becomes operational.
- The twin pipelines together can transport a combined total of 110 billion cubic metres (bcm) of gas a year to Europe for at least 50 years.
- The Nord Stream crosses the Exclusive Economic Zones (EEZs) of several countries including Russia, Finland, Sweden, Denmark and Germany, and the territorial waters of Russia, Denmark, and Germany.
- In Germany, the pipeline connects to the OPAL (Baltic Sea Pipeline) and NEL (North European Pipeline) which further connects to the European grid.



### How War Impacted Nord Stream Supply?

- Russia had already decreased the supply of gas to Europe after the European Union imposed sanctions on Moscow for invading Ukraine.
- Flows via Nord Stream 1 were reduced to 20% of its capacity in July 2022.
- In August 2022, Russia further plugged the supply and stopped Nord Stream 1 completely, citing maintenance. Gazprom had reasoned that an oil leak in a turbine on the Nord Stream 1 pipeline was behind the closure.
- The Nord Stream 2, despite being completed, could not become operational after Germany pulled out of the project after Russia invaded Ukraine.
- The stream was supposed to double Russia's energy export to Europe to 110 billion cubic meters.
- The short supply of the gas pipeline resulted in a sudden hike in energy prices in Europe. With the shutting down of the Nord Stream pipeline, Europe faces a tough time ahead with winter approaching.

### What is its Significance of Nord Stream for Europe and Russia?

#### Europe:

- Europe requires more than 100 billion cubic metres (bcm) of natural gas each year and around 40% of its gas comes from Russia. Over the last few years, Europe has become more dependent on gas imports because of a decrease in domestic gas production. Reducing dependence on Russian gas is difficult as there are no easy replacements.
- Many European businesses have large investments in Nord Stream 2 and there is pressure on governments from these businesses. Finally, a reduction in gas from Russia would increase already high gas prices and that would not be popular domestically.

#### Russia:

- As for Russia, which has the largest natural gas reserves in the world, around 40% of its budget comes from sales of gas and oil.

- Nord Stream 2 is important because it eliminates the risks related with sending gas through transit countries, cuts operating costs by doing away with transit fees and gives direct access to its most important European customer, Germany.

## **2.7 Towards Open and Secure Indo-Pacific**

In a world undergoing dynamic transformation, few regions are changing more rapidly than the others like the Indo-Pacific region. It is indisputable that the Indo-Pacific is the 21st century's locus in trade and technology incubation that makes Indo-Pacific a prominent addition to the geopolitical lexicon.

- In line, the security and stability of this region remains a major issue and goes beyond a mere consideration of emerging political equations. And to achieve open and secure Indo-Pacific, stakeholder nations need a 'collaborative management' approach.

### **What is the Significance of the Indo-Pacific?**

- The Indo-Pacific region is one of the most populous and economically active regions of the world which includes four continents: Asia, Africa, Australia and America.
- The dynamism and vitality of the region is self-evident, 60% of the world's population and 2/3rd of the global economic output makes this region a global economic centre.
- The region is also a great source and destination for Foreign Direct Investment. Many of the world's critical and large supply chains have an Indo-Pacific connection.
- There are vast reserves of marine resources in the Indian and Pacific Oceans combined, including offshore hydrocarbons, methane hydrates, sea bed minerals and rare earth metals. Sizable coastlines and Exclusive Economic Zones (EEZs) provide littoral countries with competitive capabilities for exploiting these resources.
- In turn, a number of the world's largest economies are located in the Indo-Pacific region, including India, U.S.A, China, Japan, Australia.

### **What are the Current Challenges in the Indo-Pacific?**

- Theatre of Geo-Strategic Competition: Indo-Pacific is the principal theatre of geo-strategic competition between different multilateral institutions like QUAD and Shanghai Cooperation Organisation.
- China's Militarization Move: China has been a challenge to India's interests and stability in the Indian Ocean.
- India's neighbours are receiving military and infrastructural assistance from China, including submarines for Myanmar, frigates for Sri Lanka, and its overseas military base in Djibouti (Horn of Africa). Also, China has a hold over Hambantota port (Sri Lanka), which is just a few hundred miles off the shores of India.
- **Hotspot for Non-Traditional Issues:** The region's vastness makes it difficult to assess and address multiple risks, including incidents of piracy, trafficking and terrorism.
- The Indo-Pacific region is facing serious challenges related to geographical and ecological stability due to climate change and the three consecutive La Niña events that are causing cyclones and tsunamis.

- Also, illegal, unregulated and unreported (IUU) fishing and marine pollution is hampering the aquatic life of this region.
- India's Limited Naval Capacity: Indian Navy has limited resources and capacity to strengthen its efforts because of limited allocation of Indian military budget. Also, lack of overseas military bases creates a fundamental logistical challenge for India to maintain its presence in the Indo-Pacific.

### **How can India Enhance its Presence in the Indo-Pacific?**

- Issue based Coalitions: Indo-Pacific collaboration cannot be successful without coordinated and issue-based partnerships framed by a burden-sharing model.
- Recently, three maritime nations, France, the UAE and India, launched a trilateral framework in the Indo-Pacific for cooperation in maritime security, humanitarian assistance and disaster relief (HADR), blue economy, regional connectivity, energy and food security and people-to-people cooperation.

### **Maritime Awareness:**

- From Indian Naval perspective, there is a need to create broader and more reliable situational awareness of developments in the Indian Ocean Region through intelligence gathering and surveillance, with Andaman and Nicobar Islands as a line of sight. India's Stand on Multipolarity in Indo-Pacific: With 1/5 of the world's population and the 5th largest economy, India is entitled to have its own side, weigh its own interests, and make its own choices and these choices will not be cynical and transactional, but rather reflect a balance of Indian values and national interests.
- India emphasises upon all alignment, for example, it only participated in the military component of Vostok Exercise and abstained from the naval component that took place near the Kuril Island (disputed region of Russian and Japan).
- Also, India's SAGAR vision (Security and Growth for all in the Region), is a template of shared responses to shared challenges in the Indo-Pacific.

### **Enhancing Engagement with Indo-Pacific Countries:**

- India needs to ramp up defence production at home as well as promote arms exports that will open the door for a more active Indian engagement with hard security issues in the Indo-Pacific.
- India is now looking to liberalise trade relations with strategic partners like Australia and the sale of the Brahmos supersonic cruise missile systems to the Philippines lend a sharper edge to India's engagement with the Indo-Pacific.
- Towards Free, Open and Secure Indo-Pacific: The need of the hour is to stress upon promoting economic collaboration and collective growth in Indo-Pacific, with active participation of stakeholder nations in economic and social front aiming for open, connected, prosperous, secure, and resilient Indo-Pacific and ensure a more inclusive and sustainable future.

## 2.8 The Interpol General Assembly Meeting in Delhi

The General Assembly of the International Criminal Police Organisation (Interpol) is meeting in Delhi for four days from October 18, 2022.

- This is the second time since 1997 the 195 member-strong body is holding such a large conference in India.

### **What is the Interpol?**

- It was set up in 1923, as a secure information-sharing platform that facilitates criminal investigation of police forces across the globe through collection and dissemination of information received from various police forces.
- It is headquartered in Lyon, France.
- It keeps track of the movements of criminals and those under the police radar in various regions and tips off police forces which had either sought the Interpol's assistance or which in its opinion will benefit from the particulars available with it.
- It aims to promote the widest-possible mutual assistance between criminal police forces.

### **How is the Interpol Organised?**

- The head of Interpol is the President who is elected by the General Assembly. He comes from one of the member-nations and holds office for four years.
- The day-to-day activities are overseen by a full-time Secretary General elected by the General Assembly, who holds office for five years.
- The General Assembly lays down the policy for execution by its Secretariat which has several specialised directorates for cybercrime, terrorism, drug trafficking, financial crime, environmental crime, human trafficking, etc. Every member-country is the Interpol's face in that country.
- All contact of a country's law enforcement agency with Interpol is through the highest investigating body of the land.
- The Central Bureau of Investigation (CBI) assumes this role in India with one of its senior officers heading its exclusive Interwing (the National Central Bureaus) for collation of information and liaison with the world body.

### **What are Interpol Notices?**

#### **About:**

- Its notices are international requests for cooperation or alerts allowing police in member countries to share critical crime-related information.
- Notices are issued by the General Secretariat at the request of a member country's INTERPOL National Central Bureau and are made available for all our member countries to consult in our Notices database.

**Different Notices:**

- Notices can also be used by the United Nations, International Criminal Tribunals and the International Criminal Court to seek persons wanted for committing crimes within their jurisdiction, notably genocide, war crimes, and crimes against humanity.

**What are Interpol’s Future Challenges?**

- The rising spectre of transnational, cyber and organised crime requires a globally coordinated law enforcement response.
- Interpol has a legacy of trust and reliability. It needs to acquire powers of sanction against a country which refuses to cooperate in implementing a red notice. It is however highly unlikely that member-nations will ever agree to dilute their sovereignty and invest the Interpol with such authority.

**2.9 Pakistan Removed from FATF Grey List**

Recently, the Financial Action Task Force (FATF), the international watchdog on terror financing and money laundering, has removed Pakistan from the list of countries under “increased monitoring” (Grey List).

- India’s other neighbour on the grey list, Myanmar, was moved to the “black list” due to actions by the military leadership after the 2021 coup.

**What is the FATF?****About:**

- FATF is the global money laundering and terrorist financing watchdog. It also aims to counter the financing of proliferation of weapons of mass destruction. It was set up in 1989 out of a G-7 meeting of developed nations in Paris. Its Secretariat is located at the Organisation for Economic Cooperation and Development (OECD) headquarters in Paris.



**Members:**

- **As of today, it is a 39-member body with 37 countries and two regional organisations:** the European Commission, and the Gulf Cooperation Council.
- Indonesia is the only observer country of FATF.
- India joined with ‘observer’ status in 2006 and became a full member of FATF in 2010. India is also a member of its regional partners, the Asia Pacific Group (APG) and the Eurasian Group (EAG).

**Greylisting and Blacklisting Countries:**

- The FATF Plenary (decision-making body of the FATF) meets tri-annually - in February, June and October, to take stock of “Mutual Evaluation Reports” (MERs) of the countries it reviews.
- If a country appears to have major deficiencies in its AML/CFT regime, it is put on a list of “jurisdictions under increased monitoring” - “grey list” and if it fails to address FATF concerns, it is put on a “high-risk jurisdictions” list - “black list”.
- AML/CFT refers to “Anti-Money Laundering/Combating the Financing of Terrorism”.
- The Grey List includes countries that are considered safe haven for supporting terror funding and money laundering. It serves as a warning that the country may enter the blacklist.
- The Black List includes Non-Cooperative Countries or Territories (NCCTs) that support terror funding and money laundering activities. As of now, Iran, North Korea and Myanmar are the three black listed countries.
- The enlisted countries are subjected to increased financial structures, thus making it difficult for them to procure loans from the financial institutions affiliated to FATF (as observers) such as the IMF, World Bank etc.

**What are the Key Points about Pak’s Removal from the Grey List?**

- **FATF’s Stand:** The FATF lauded “Pakistan’s significant progress” saying that the country had completed two action plans comprising a 34-point tasklist in the period since 2018.
- Pakistan has been removed from the list after four years. It was first put on the list in 2008, removed in 2009 and before adding it again in 2018, it remained under increased monitoring from 2012 to 2015.
- **India’s Response:** India has protested Pakistan’s lack of action against cross-border terror groups responsible for attacks on India, however, it agreed to the decision to take Pakistan off the list, as the latter had submitted “documentary evidence” of its actions against designated terrorists.
- India believes that Pakistan must continue to take “credible, verifiable, irreversible and sustainable” action against terror groups emanating from territories under its control.

**What are the Implications of Removing Pakistan from the List?****For Pakistan:**

- Being removed from the grey list, Pakistan has essentially received a reputational boost and a clean bill of health from the international community on terrorist financing.

- Considering the current situation of the country's economy, it is essentially in desperate need of investments from other countries. Removal from the grey list will definitely do the deed in this context.

**For India:**

- While four years of greylisting has scaled-down the cross-border terror, the occasional incidents of terrorists infiltration and the regular sightings of drones bearing weapon-payloads along the border suggest that Pakistan's terrorism infrastructure directed against India is presently in a recessed mode but far from being dismantled comprehensively.
- India will have to continue mustering all available instruments and options to deny Pakistan operating space to wield the terror-weapon.
- India's interests lie in playing the long game in these diplomatic battles with the goal of making the region more stable and secure.

### 3. ECONOMY

#### **3.1 Sustained efforts towards making small dairy farms in developing nations more productive, sustainable, quality oriented and profitable**

Dairy is currently the top-ranking commodity in India, with high value of output, which is almost equal to the combined output value of rice and wheat. Despite the importance of the dairy sector in overall GDP, it receives less government budgeting than the agriculture sector. Further, there has been no concentrated investment in the development of value-added or innovative products, nor any serious effort to support and modernize the informal sector.

In light of the increasing demand driven by the growing population, higher incomes and more health consciousness, the slowdown in dairy industry growth is severely worrisome. Based on estimates by the National Dairy Development Board (NDDB), the demand for milk is likely to reach 250 million tonnes by 2025. To supply the market, an average incremental increase of 5 million tonnes per annum over the *next* 15 years is required – a doubling of the average incremental rate achieved over the *past* 15 years. In the absence of sufficient increased production, India will need to rely on the world market for imports. And because of the huge volume required, it will affect global milk prices. Thus, focusing on areas for local dairy development is critical.

Traditionally, the policy environment has favoured the expansion of cooperatives, which ultimately crowded out the private sector. However, liberalization of the sector in recent years has encouraged private investment in dairying. In 2002, the Milk and Milk Products Order (MMPO) repealed the gopala mitra and many schemes and ushered in major policy changes friendly to the private sector and a momentum of activity that is likely to increase dramatically in the coming years. Large Indian and multinational corporations, such as Reliance, Pepsi and Coca-Cola, are planning significant investments.

Nowadays, both the private sector and the cooperatives drive the value chains. Because of the many unsuccessful cooperatives in the country, other models of dairy farmer organizations are being explored, such as mutually aided cooperative societies (MACS) and producer companies.

Millions of small and marginal farmers in dairying who own two to three animals and produce an average of 5 litres comprise a critical portion of India's dairy industry. Livestock development in general and dairy development activities in particular are key components of pro-poor development strategies because livestock distribution is much more equitable than land distribution. Thus, changes in the dairying environment have important implications for the smallholder farmers and for poverty reduction.

**The following characterizes India's dairy farming and its relevance to inclusive growth:**

- Small and marginal farmers own 33 percent of land and about 60 percent of female cattle and buffaloes.
- Some 75 percent of rural households own, on average, two to four animals.

- Dairying is a part of the farming system, not a separate enterprise. Feed is mostly residual from crops, whereas cow dung is important for manure.
- Dairying provides a source of regular income, whereas income from agriculture is seasonal. This regular source of income has a huge impact on minimizing risks to income. There is some indication that areas where dairy is well developed have less incidence of farmer suicide.
- About a third of rural incomes are dependent upon dairying.
- Livestock is a security asset to be sold in times of crisis.

### 3.2 Financial Stability and Development Council

Financial Stability and Development Council (FSDC) is an apex-level body constituted by the government of India. The idea to create such a super regulatory body was first mooted by the Raghuram Rajan Committee in 2008. Finally in 2010, the then Finance Minister of India, Pranab Mukherjee, decided to set up such an autonomous body dealing with macro prudential and financial regularities in the entire financial sector of India. An apex-level FSDC is not a statutory body.

The recent global economic meltdown has put pressure on governments and institutions across the globe to regulate their economic assets. This council is seen as India's initiative to be better conditioned to prevent such incidents in future. The new body envisages to strengthen and institutionalize the mechanism of maintaining financial stability, financial sector development, inter-regulatory coordination along with monitoring macro-prudential regulation' of economy. No funds are separately allocated to the council for undertaking its activities. Union Minister for Finance & Corporate Affairs Smt. Nirmala Sitharaman chaired the 26th meeting of the Financial Stability and Development Council (FSDC) , 2022.

#### **Composition of the council**

- **Chairperson:** The Union Finance Minister of India
- **Members:**
  - Governor Reserve Bank of India (RBI),
  - Finance Secretary and/ or Secretary, Department of Economic Affairs (DEA),
  - Secretary, Department of Financial Services (DFS),
  - Secretary, Ministry of Corporate Affairs,
  - Secretary, Ministry of Electronics and Information Technology,
  - Chief Economic Advisor, Ministry of Finance,
  - Chairman, Securities and Exchange Board of India (SEBI),
  - Chairman, Insurance Regulatory and Development Authority (IRDA),
  - Chairman, Pension Fund Regulatory and Development Authority (PFRDA),
  - Chairman, Insolvency and Bankruptcy Board of India (IBBI),
- Additional Secretary, Ministry of Finance, DEA, will be the Secretary of the Council,
- The Chairperson may invite any person whose presence is deemed necessary for any of its meetings.

**Responsibilities;**

- Financial Stability
- Financial Sector Development
- Inter-Regulatory Coordination
- Financial Literacy
- Financial Inclusion
- Macro prudential supervision of the economy including the functioning of large financial conglomerates
- Coordinating India's international interface with financial sector bodies like the Financial Action Task Force (FATF), Financial Stability Board (FSB) and any such body as may be decided by the Finance Minister from time to time.

**3.3 NEERMAN Awards**

NEERMAN Awards, (National Energy Efficiency Roadmap for Movement towards Affordable & Natural Habitat) were announced, with the goal of encouraging exceptionally efficient building designs complying with BEE's Energy Conservation Building Codes.

**Bureau of Energy Efficiency**

- The BEE is a statutory body established through the Energy Conservation Act, 2001 under the Union Ministry of Power.
- It assists in developing policies and strategies with the primary objective of reducing the energy intensity of the Indian economy.
- BEE coordinates with designated consumers, designated agencies, and other organizations to identify and utilize the existing resources and infrastructure, in performing its functions.

**3.4 Experts highlight positive impact of Fortified Rice on public health**

- In order to popularise and create awareness about the benefit of Fortified Rice specially in Tribal Areas of the country, the Department of Food and Public Distribution (DFPD) is coordinating with Gujarat, Maharashtra, Chhattisgarh, Madhya Pradesh, Jharkhand, Telangana Rajasthan, Kerala to organize workshops and seminars in the sensitive areas of tribal belts and districts that have population that are vulnerable to Thalassemia and Sickle Cell Anaemia.

So far, workshops/seminars have been organised in 5 locations across 4 States namely: Valsad in Gujarat, Nandurabar and Nashik in Maharashtra, Kanker in Chhattisgarh and East Singhbhum, Jamshedpur in Jharkhand.

- The experts discussed the importance of Fortification and how it will boost nutritional requirements of the people of the country. In Nashik, Asst. Prof. (Dr) Hemangini Gandhi, MS University Vadodara.

After that, Dr. Renuka Mainde, Convener NetProFan- Nagpur Chapter & Corporate Nutritionist made a presentation on fortified rice, its positive impact on public health and its linkages with Haemoglobinopathies.

- Shri Vivek Shukla while summing up the discussions, laid emphasis on providing correct information to beneficiaries so that apprehensions can be allayed in time. The workshop was also covered by the local Media and was well attended by FPS dealers, especially dealers hailing from tribal areas of Nashik.
- In Nandurbar district, a presentation was made by Prof. (Dr.) Sirimavo Nair, Nodal Officer, Gujarat (NFSA Concurrent Evaluation D/o Food & PD-Govt. of India) made a presentation on fortified staples and its positive impact on public health. Presentations were also made by Dr Naresh Tayade, Dr Panjabrao Deshmukh Memorial Medical College, Amravati and Dr Narayan Bawa, Health officer, District Hospital, Nandurbar, Maharashtra on benefits of fortified rice and its linkages with Haemoglobinopathies. The presentations were followed by a Panel discussion and Q&A session by technical experts and officials from FCI and D/o Food & PD.
- Fortification is the process of adding Fortified Rice Kernels (FRK), containing FSSAI prescribed micronutrients (Iron, Folic Acid, Vitamin B12) to normal Rice (Custom Milled Rice) in the ratio of 1:100 (Mixing 1 Kg of FRK with 100 Kg custom milled rice).

### **3.5 Fortified rice**

- Fortified rice is nearly identical to traditional rice in aroma, taste, and texture. This process is done in the rice mills at the time of milling of rice.
- Rice fortification ecosystem has been enhanced significantly on boarding rice millers, FRK manufacturers, industries and other stakeholders for production and supply of fortified rice to meet the target requirement. There are more than 9000 rice mills in the country which have installed blending infrastructure for production of fortified rice and their cumulative monthly production capacity is around 60 LMT which is increased by more than 4 times since last year.
- Fortification of rice is found to be a cost-effective and complementary strategy to increase vitamin and mineral content in diets with low turnaround time (TAT) and a step towards nutritional security and helps in fighting anaemia and malnutrition in the country. This strategy is implemented in many geographies in the world.

### **3.6 National Logistics Policy**

- The policy focuses on key areas such as process re-engineering, digitisation, and multi-modal transport.
- It is a crucial move as high logistics cost impacts the competitiveness of domestic goods in the international market.

- The need for a national logistics policy was felt since the logistics cost in India is high as compared to other developed economies.

**Goals:**

- Logistics costs have to be cut by half to be near global benchmarks by 2030 by reducing the cost of logistics from 14-18% of GDP to global best practices of 8%.
- Countries like the US, South Korea, Singapore, and certain European nations have such a low logistics cost-to-GDP ratio.
- The current cost is 16% of GDP.
- Being the 5th largest economy in the world, India aims to be among the top 10 in the LPI (Logistics Performance Index) by 2030. It has to match the pace of South Korea.
- In 2018, India was ranked 44th in the LPI.
- Creating data-driven Decision Support Systems (DSS) to enable an efficient logistics ecosystem.
- The policy's target is to ensure that logistical issues are minimized, exports grow manifold, and small industries and the people working in them benefit significantly.

**Interventions and Objectives:**

- **Digital Integration System:** It will lead to seamless and faster work-flow, making logistics significantly more efficient.
- **Unified Logistics Interface Platform:** It aims to collapse all logistics and transport sector digital services into a single portal, thereby freeing manufacturers and exporters from the present tyranny of long and cumbersome processes.
- **Ease of Logistics Services:** E-Logs, a new digital platform, will allow industry to directly take up operational issues with government agencies for speedy resolution.
- **Comprehensive Logistics Action Plan:** The Comprehensive Logistics Action Plan comprising integrated digital logistics systems, standardization of physical assets, benchmarking service standards, human resource development, capacity building, development of logistics parks, etc.

**Significance of the Policy?**

- PM Gati Shakti will get further boost and complementarily with the launch of the National Logistics Policy.
- The Policy will help make the sector an integrated, cost-efficient, resilient, and sustainable logistics ecosystem in the country as it covers all bases of the sector along with streamlining rules and addressing supply-side constraints.
- The policy is an endeavor to improve the competitiveness of Indian goods, enhance economic growth and increase employment opportunities.



- The rail sector suffers from many structural deficiencies which have to be eliminated fast if the logistics cost has to be halved to global benchmarks. The average speed of a freight train has stagnated at 25 kmph for decades it has to be urgently doubled to 50 kmph at least.
- The railways need to have a time-table based goods operation. It has to become an aggregator at the source of freight, and disaggregator at the destination, to capture the high-value small-load business.
- For decades the country has talked about eco-friendly and cost-effective inland waterways freight movement, but nothing has happened.
- There is valuable learning available from the river ports of China, who puts key emphasis on Port Infrastructure.
- Road logistics is a totally fragmented sector, where a large chunk of truck owners have a very small fleet.
- There is a clear case for the aggregation of small operators with government-supported aggregation apps. Similarly, there is a need for large players in the sector to drag costs down.
- Apart from improvement in key functional areas, the size of our ports have to grow manifold.
- It is time to give wings to air logistics and drastically improve the transport of high-value and perishable items.

### **3.7 Gross Direct Tax collections for the Financial Year (FY) 2022-23 register a growth of 30%**

- Net Direct Tax collections for the FY 2022-23 have grown at 23%
- Advance Tax collections for the FY 2022-23 stand at Rs. 2,95,308 crore as on 17.09.2022 which shows a growth of 17%
- Refunds aggregating to Rs. 1,35,556 crore issued in the current fiscal, higher by 83% over the preceding year
- Direct tax collections continue to grow at a robust pace, a clear indicator of the revival of economic activity post pandemic, as also the result of the stable policies of the Government, focusing on simplification and streamlining of processes and plugging of tax leakage through effective use of technology.
- The figures of Direct Tax collections for the FY 2022-23, as on 17.09.2022 show that net collections are at Rs. 7,00,669 crore, compared to Rs. 5,68,147 crore in the corresponding period of the preceding Financial Year i.e. FY 2021-22, representing an increase of 23%. The Net Direct Tax collection of Rs. 7,00,669 crore (net of refund) includes Corporation Tax (CIT) at Rs. 3,68,484 crore and Personal Income Tax (PIT) including Securities Transaction Tax (STT) at Rs. 3,30,490 crore.
- The Gross collection of Direct Taxes (before adjusting for refunds) for the FY 2022-23 stands at Rs. 8,36,225 crore compared to Rs. 6,42,287 crore in the corresponding period of the preceding Financial Year i.e. FY 2021-22, registering a growth of 30% over collections of FY 2021-22. The Gross collection of Rs. 8,36,225 crore includes.

- **Corporation Tax** (CIT) at Rs. 4,36,020 crore and Personal Income Tax (PIT) including Securities Transaction Tax (STT) at Rs. 3,98,440 crore. Minor head wise collection comprises Advance Tax of Rs. 2,95,308 crore; Tax Deducted at Source of Rs. 4,34,740 crore; Self-Assessment Tax of Rs. 77,164 crore; Regular Assessment Tax of Rs. 20,080 crore; and Tax under other minor heads of Rs. 8,933 crore.
- **The cumulative Advance Tax collections** for the first and second quarter of the FY 2022-23 stand at Rs. 2,95,308 crore as on 17.09.2022, against Advance Tax collections of Rs. 2,52,077 crore for the corresponding period of the immediately preceding Financial Year i.e FY 2021-22, showing a **growth of 17%**. The Advance Tax collection of Rs. **2,95,308** crore comprises Corporation Tax (CIT) at Rs. 2,29,132 crore and Personal Income Tax (PIT) at Rs. 66,176 crore.
- There has been a remarkable increase in the speed of processing of income tax returns filed during the current fiscal, with almost **93%** of the duly verified ITRs having been processed till 17.09.2022. This has resulted in faster issue of refunds with almost a **468%** increase in the number of refunds issued in the current financial year. Refunds amounting to **Rs. 1,35,556** crore have been issued in the FY 2022-23 till 17.09.2022, as against refunds of Rs. 74,140 crore issued during the corresponding period in the preceding Financial Year 2021-22, showing a **growth of over 83%**.

### **3.8 IBBI amends Insolvency and Bankruptcy Board of India (Liquidation Process) Regulations, 2016 and Insolvency and Bankruptcy Board of India (Voluntary Liquidation Process) Regulations, 2017**

The Insolvency and Bankruptcy Board of India notified the Insolvency and Bankruptcy Board of India (Liquidation Process) (Second Amendment) Regulations, 2022 ('Amendment Liquidation Regulations') and Insolvency and Bankruptcy Board of India (Voluntary Liquidation Process) (Second Amendment) Regulations, 2022 ('Amendment Voluntary Liquidation Regulations') on 16th September, 2022.

To enable better participation of stakeholders and streamline the liquidation process to reduce delays and realise better value, the amendment in Liquidation Regulations make the following major modifications:

- The Committee of Creditors (CoC) constituted during Corporate Insolvency Resolution Process (CIRP) shall function as Stakeholders Consultation Committee (SCC) in the first 60 days. After adjudication of claims and within 60 days of initiation of process, the SCC shall be reconstituted based upon admitted claims.
- The liquidator has been mandated to conduct the meetings of SCC in a structured and time bound manner with better participation of stakeholders.
- The scope of mandatory consultation by liquidator, with SCC has been enlarged. Now, SCC may even propose replacement of liquidator to the Adjudicating Authority (AA) and fix the fees of liquidator, if the CoC did not fix the same during CIRP.

- If any claim is not filed during liquidation process, then the amount of claim collated during CIRP shall be verified by the liquidator.
- Wherever the CoC decides that the process of compromise or arrangement may be explored during liquidation process, the liquidator shall file application only in such cases before Adjudicating Authority for considering the proposal of compromise or arrangement, if any, within thirty days of the order of liquidation.
- Specific event-based timelines have been stipulated for auction process.
- Before filing of an application for dissolution or closure of the process, SCC shall advise the liquidator, the manner in which proceedings in respect of avoidance transactions or fraudulent or wrongful trading, shall be pursued after closure of liquidation proceedings.
- The Amendment Liquidation Regulations and Amendment Voluntary Liquidation Regulations further lay down the manner and period of retention of records relating to liquidation and voluntary liquidation of a corporate debtor or corporate person, respectively.

### **3.9 What is the Insolvency and Bankruptcy Code?**

Insolvency is when a person or enterprise cannot pay debts, while bankruptcy is a legal declaration by the Court of the failure of the insolvency resolution process. The resolution of the insolvency process can be started by any of the firm's stakeholders: debtors, creditors, or employees. The Insolvency and Bankruptcy Code covers all individuals, companies, Limited Liability Partnerships (LLPs), and partnership firms. This May, the insolvency and bankruptcy code completed six years since parliament passed in 2016. The Insolvency and Bankruptcy Code of 2016 repealed all the previous laws related to the resolutions of insolvency and bankruptcy.

#### **Objectives of Insolvency and Bankruptcy Code**

**The objectives of the IBC, Insolvency and Bankruptcy Code are as follows:**

- To centralize and amend all existing insolvency laws in India.
- To accelerate and clarify the insolvency and bankruptcy proceedings in India.
- To safeguard the interests of the firm's stakeholders/debtors/creditors/employees.
- To encourage entrepreneurship and also renew the company in a time-bound manner.
- To set up an insolvency and bankruptcy board in India.
- To provide essential relief to the creditors and, consequently, the credit supply in the economy will increase.

### 3.10 India- UAE CEPA

- India- UAE CEPA, India's non-petroleum exports to UAE grow by 14% Year-on-Year during June-August 2022
- Growth in exports achieved amidst significant global macroeconomic headwinds
- India-UAE CEPA bears fruit; India's non petroleum exports to UAE grow by more than 5 times India's non-petroleum exports to the world during June-August 2022 (Year on year)
- India-UAE CEPA was signed on 18th February 2022, during the India-UAE Virtual Summit. The Agreement is expected to enter into force on 1st May 2022.
- CEPA provides for an institutional mechanism to encourage and improve trade between the two countries.
- The Agreement is a comprehensive agreement, which will cover:
  - Trade-in Goods.
  - Rules of Origin.
  - Trade-in Services.
  - Technical Barriers to Trade (TBT).
  - **Sanitary and Phytosanitary (SPS) measures.**
  - Dispute Settlement.
  - Movement of Natural Persons.
  - Telecom.
  - Customs Procedures.
  - Pharmaceutical products.
  - Government Procurement.
  - **Intellectual Property Rights (IPR)**, Investment, Digital Trade and Cooperation in other Areas.

### 3.11 Benefits of India-UAE CEPA?

- **Trade-in Goods:** India will benefit from preferential market access provided by the UAE, especially for all labour-intensive sectors.
  - Such as Gems and Jewellery, Textiles, leather, footwear, sports goods, plastics, furniture, agricultural and wood products, engineering products, medical devices, and Automobiles.
- **Trade-in Services:** Both India and UAE have offered each other market access to the broad service sectors.
  - Such as 'business services', 'communication services', 'construction and related engineering services', 'distribution services', 'educational services', 'environmental services', 'financial services', 'health-related and social services', 'tourism and travel-related services', 'recreational cultural and sporting services' and 'transport services'.

- **Trade-in Pharmaceuticals:** Both sides have also agreed to a separate Annex on Pharmaceuticals to facilitate access to Indian pharmaceuticals products, especially automatic registration and marketing authorization in 90 days for products meeting specified criteria.

### **3.12 India climbs to the 40th rank in the Global Innovation Index of WIPO; a huge leap of 41 places in 7 years**

Recently, India was ranked 40th position out of 132 in the **Global Innovation Index (GII) 2022 rankings** released by **World Intellectual Property Organisation (WIPO)**.

- India was ranked 46th position in 2021, and 81st rank in 2015.

#### **What are the Highlights of the Report?**

##### **Ranking of the Countries:**

##### **Most Innovative Economy:**

- Switzerland is the most innovative economy in the world in 2022 - for the 12th year in a row - followed by the United States, Sweden, the United Kingdom and the Netherlands.
- China is nearing the top 10 while Turkey and India enter the top 40 for the first time.

##### **Performance of India:**

- **India is the innovation leader** in the lower middle-income group.
- It continues to lead the world in ICT services exports and holds top rankings in other indicators, including venture capital receipt value, finance for startups and scaleups, graduates in science and engineering, labor productivity growth and domestic industry diversification.

##### **Increase in R & D Expenditure:**

- The top global corporate R&D spenders increased their R&D expenditure by almost 10% to over USD 900 billion in 2021, higher than in 2019 before the pandemic.

##### **Venture Capital (VC) Growth:**

- It exploded by 46% in 2021, recording levels comparable to the internet boom years of the late 1990s. Latin America and the Caribbean and Africa regions are witnessing the strongest VC growth.

#### **What is the Global Innovation Index?**

##### **About:**

- The Global Innovation Index, which is published annually, has been a leading reference for measuring an economy's innovation performance.
- A large number of countries use the GII to assess and improve their innovation ecosystems and use the GII as a reference in economic plans and/or policies.

- The GII has also been recognized by the UN Economic and Social Council in its 2019 resolution on Science, Technology and Innovation for Development as an authoritative benchmark for measuring innovation in relation to the Sustainable Development Goals (SDGs).

**Indicators of the index:**

- Parameters for computing the index include 'institutions', 'human capital and research', 'infrastructure', 'market sophistication', 'business sophistication', 'knowledge and technology outputs' and 'create outputs'.

**Theme for 2022: “What is the future of innovation-driven growth?”.**

- **Effects of Two Novel Innovation Waves:** The GII 2022 also outlines the positive effects of two novel innovation waves, although it emphasizes that such effects would take some time to be realized:
- A digital age innovation wave built on supercomputing, artificial intelligence, and automation.
- **Effect:** making ample productivity impacts across all sectors and fields of scientific research.
- A Deep Science innovation wave built on breakthroughs in biotechnologies, nanotechnologies, new materials, and other sciences.
- **Effect:** revolutionizing innovations in health, food, environment, and mobility (four fields of key importance to society).



## 4. ENVIRONMENT

### 4.1 New targets under National Clean Air Programme (NCAP)

#### **Context:**

Under the National Clean Air Programme (NCAP), the MOEFCC has set a new target of a 40% reduction in particulate matter concentration in cities by 2026.

#### **About**

- The target was updated due to an overall improvement in PM10 levels in 2021.
- 20 cities have met the national standards for annual average PM10 concentration (60 microgram per cubic metre).
- 95 of the 131 non-attainment cities (NACs) covered under the NCAP have witnessed an “overall improvement” in PM10 levels in 2021 as compared to 2017 levels.
- NACs are cities whose air quality did not meet the national ambient air quality standards (NAAQS) of 2011 to 2015.
- PRANA (Portal for Regulation of Air-pollution in non-Attainment cities) portal monitors the implementation of NCAP.

#### **National Clean Air Programme (NCAP)**

- It was launched by the MoEFCC in 2019 as a long-term, time-bound, national level strategy that features:
- Making determined efforts to deal with the air pollution problem across the country in a comprehensive manner.
- Achieving 20%- 30% reduction target in Particulate Matter concentrations by 2024 where 2017 is kept as the base year for the comparison of concentration.
- Identification of 122 non-attainment cities across the country based on the 2014-2018 Air Quality data.
- Non- Attainment Cities are the cities which do not meet the National Ambient Air Quality Standards.
- Establishing a right mix with the existing policies and programmes which include the National Action Plan on Climate Change (NAPCC) and other government initiatives related to climate change.
- Setting up of certification agencies for monitoring equipment, source apportionment studies, emphasis on enforcement, specific sectoral interventions etc.

#### **Objective of NCAP:**

- To augment and evolve effective and proficient ambient air quality monitoring networks across the country.
- To have efficient data dissemination and public outreach mechanisms for timely measures for prevention and mitigation of air pollution.
- To have a feasible management plan for prevention, control and abatement of air pollution.

### **Other Efforts to Prevent Air Pollution**

- **Commission for Air Quality Management:** The Commission for Air Quality Management in the National Capital Region and adjoining areas, 2020 with a provision for a fine of Rs 1 crore and/or jail for 5 years for those violating air pollution norms.
- **Pradhan Mantri Ujjwala Yojana:** A Household LPG program and other schemes have helped to dramatically expand access to clean energy, especially for rural households.

### **Steps Needed to Preserve Clean Air**

- Implement afforestation.
- Say no to plastic use.
- Turn off the lights when not in use.
- Use public transport.
- Recycle and reuse.
- Avoid burning crackers.

### **Way Ahead**

- For successful implementation of the action plan, there is an urgent need for cooperation and coordination among state agencies and technical supervision by expert Institutions

## **4.2 Lead Poisoning Prevalence in India**

### **Context:**

- A report by Niti Aayog and the Council of Scientific & Industrial Research (CSIR) has found that India bears the world's highest health and economic burden due to lead poisoning.

### **Key Highlights of the Report**

#### **Global Findings:**

- Around 1 in 3 children – up to approximately 800 million globally – have blood lead levels (BLL) at or above 5 micrograms per decilitre ( $\mu\text{g}/\text{dL}$ )
- Children around the world are being poisoned by lead on a massive and previously unrecognized scale.
- The impact of lead on adults is so large that over 900,000 premature deaths per year are attributed to lead exposure.
- Many countries lack sufficient formal recycling infrastructure and capacity to handle the quantity of used lead-acid batteries flooding their markets.

#### **Findings about India:**

- It had found India to be home to a major chunk of children (275,561,163 of the 800 million) poisoned by lead globally.

- **Most affected states:** Bihar, Uttar Pradesh, Madhya Pradesh, Jharkhand, Chhattisgarh and Andhra Pradesh.
- Deaths due to lead poisoning have continued to rise in India even though lead use in petrol — a key source was phased out by 2000 in the country.

### **Lead Poisoning**

- Lead is a highly toxic metal and a very strong poison.
- Lead poisoning is a serious and sometimes fatal condition. It occurs when lead builds up in the body.

### **Common Sources of Lead Exposure:**

- Lead in water from the use of leaded pipes;
- Lead from active industry, such as mining and the unsound recycling of used lead-acid batteries (ULABs);
- Lead-based paint and pigments;
- Leaded gasoline (which has declined considerably in recent decades, but was a major historical source);
- Lead solder in food cans; and
- Lead in spices, cosmetics, ayurvedic medicines, toys and other consumer products.
- Children are also exposed to lead in-utero through exposure of their mothers, with adverse impacts on neuro behavioural development.

### **Impact:**

- Lead poisoning can cause severe mental and physical impairment. Young children are most vulnerable.
- Exposure to high levels of lead may cause anemia, weakness, and kidney and brain damage.
- Lead is more harmful to children because their brains and nervous systems are still developing.
- Treatment: Lead poisoning can be treated, but any damage caused cannot be reversed.

### **Way Ahead**

- There is a desperate need for policy changes at the national and state levels given the severe health implications.
- These include identifying at-risk populations through BLL monitoring, investigating sources of elevated BLLs and healthcare workforce training to sensitise them to monitor, detect and treat lead poisoning.
- India needs to devise implementable strategies on a state level, through regional bureaucracy, local press and vernacular language to have a tangible impact.
- There is a need to undertake targeted research and intervention studies to identify potential newer sources which policy makers and the scientific community can address head on.
- Childhood lead poisoning should command an urgent international response.

### 4.3 India's first sanctuary for slender lorises notified

#### Why in News?

- The Tamil Nadu government has declared the Kadavur forest region in Karur and Dindigul districts as the Wildlife sanctuary for the endangered species – Slender loris.

#### About Slender Loris

- They are small nocturnal mammals that are arboreal in nature as they spend most of their life on trees.
- The species acts as a biological predator of pests in agricultural crops and benefits farmers.
- It has a wide range of ecological roles to play in the terrestrial ecosystem.
- The survival of the species depends on its habitat improvement, conservation efforts and mitigation of threats



#### About the Sanctuary

- Area – 11,806.56 hectares
- State – Tamilnadu
- Districts – Karur and Dindigul
- Declared under – the Wildlife (Protection) Act of 1972
- Census on February (of Slender loris) - 1,172

### 4.4 Stockholm Convention

#### Context:

The 18th meeting of the Persistent Organic Pollutant review committee to the Stockholm Convention has recently concluded its review of four of the five chemicals under consideration.

- It is a global treaty to protect human health and the environment from Persistent Organic Pollutants (POPs).
- It was opened for signature in 2001 in Stockholm (Sweden) and became effective in 2004.
- POPs are listed in various Annexes to the Stockholm Convention after thorough scientific research, deliberations and negotiations among member countries.

#### Objectives:

- Support the transition to safer alternatives.
- Target additional POPs for action.

- Clean up old stockpiles and equipment containing POPs.
- Work together for a POPs-free future.
- India ratified the Stockholm Convention in 2006 as per Article 25(4), which enabled it to keep itself in a default "opt-out" position such that amendments in various Annexes of the convention cannot be enforced on it unless an instrument of ratification/ acceptance/ approval or accession is explicitly deposited with UN depositary.
- The convention calls to ban nine of the dirty dozen chemicals (key POPs), limit the use of DDT to malaria control, and curtail inadvertent production of dioxins and furans. The convention listed twelve distinct chemicals in three categories:
  - Eight pesticides (aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, mirex and toxaphene)
  - Two industrial chemicals (poly chlorinated biphenyls and hexachlorobenzene)
  - Two unintended by-products of many industrial processes involving chlorines such as waste incineration, chemical and pesticide manufacturing and pulp and paper bleaching (poly chlorinated dibenzo-p-dioxins and dibenzofurans, commonly referred to as dioxins and furans).

#### **4.5 Living Planet Report 2022**

There has been a 69 per cent decline in the wildlife populations of mammals, birds, amphibians, reptiles and fish, across the globe in the last 50 years, according to the latest Living Planet Report by World Wide Fund for Nature (WWF).

##### **What is Living Planet Report?**

- The Living Planet Report is published every 2 years by the World Wide Fund for Nature since 1998.
- It is based on the Living Planet Index and ecological footprint calculations.
- The report is the world's leading, science-based analysis, on the health of our planet and the impact of human activity.

##### **What are the Key Findings of the Report?**

###### **Region-wise Decline in Wildlife Populations:**

- The highest decline in the wildlife populations (94%) was in the Latin America and the Caribbean region.
- Africa recorded a 66% fall in its wildlife populations from 1970-2018 whereas the Asia-Pacific recorded a decline of 55%.

###### **Decline in Freshwater Species:**

- Freshwater Species populations globally reduced by 83%.
- Habitat loss and barriers to migration routes were responsible for about half of the threats to monitored migratory fish species.

**Collapsing Vertebrate Wildlife Populations:**

- Living Planet Index (LPI) showed that vertebrate wildlife populations are collapsing at a particularly staggering rate in tropical regions of the world.
- Featuring about 32,000 populations of 5,230 species across the world, LPI is a measure of the state of the world's biological diversity based on population trends of vertebrate species from terrestrial, freshwater and marine habitats.

**Mangrove Degradation:**

- Mangroves continue to be lost to aquaculture, agriculture and coastal development at a rate of 0.13% per year.
- Many mangroves are also degraded by overexploitation and pollution, alongside natural stressors such as storms and coastal erosion.
- Around 137 square kilometres of the Sundarbans mangrove forest in India and Bangladesh has been eroded since 1985, reducing land and ecosystem services for many of the 10 million people who live there.

**What is the Living Planet Index (LPI)?**

- The Living Planet Index (LPI) is a measure of the state of the world's biological diversity based on population trends of vertebrate species from terrestrial, freshwater and marine habitats.
- The LPI was adopted by the Convention of Biological Diversity (CBD) as an indicator of progress towards its 2011-2020 targets.
- It can play an important role in monitoring progress towards the post-2020 goals and targets negotiated at COP15 this December.

**4.6 Global Clean Energy Action Forum- 2022****Context:**

- The Global Clean Energy Action Forum-2022 was recently held in Pittsburgh, Pennsylvania in the United States.

**About Global Clean Energy Forum-2022**

- The US, for the first time, hosted Global Clean Energy Action Forum, a joint convening of the 13th Clean Energy Ministerial (CEM 13) and the 7th Mission Innovation Ministerial (MI-7), from 21st to 23rd September 2022.

**Theme**

- Rapid Innovation and Deployment is the CEM13/MI-7's theme.
- By working together and adopting common deployment techniques for clean energy technology, we can quicken the pace and scope of innovation.



**Goal**

- Organize an engaging, motivational, and significant event in 2022 that will highlight how leaders from around the world are implementing their climate commitments.
- Concentrate on taking steps that will lead to a low-cost, emissions-free energy future that offers possibilities for everyone, especially well-paying jobs.
- In order to accomplish climate targets and innovate with a purpose, demonstrate progress in moving along the innovation-to-deployment continuum at an unprecedented pace and scale.

**India's Stand**

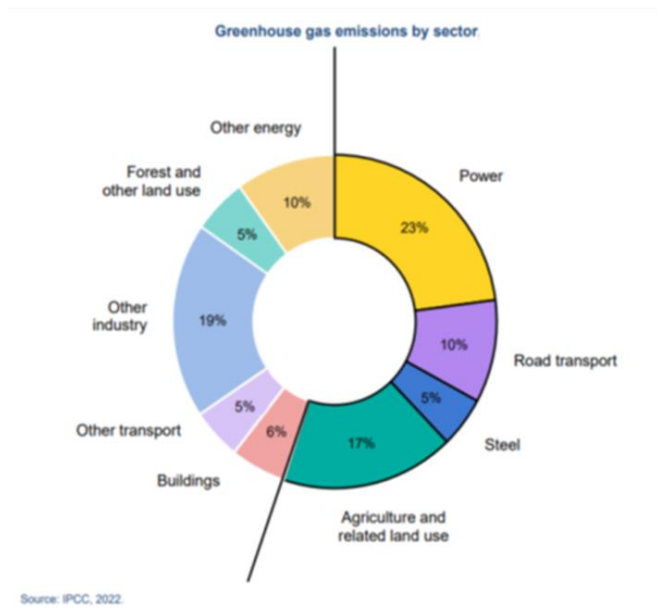
- In accordance with reports, India has established 5 Bioenergy Centers with interdisciplinary teams working on improved sustainable biofuels employing cutting-edge biotechnology methods.
- India hosted the Mission Innovation Annual Gathering in April 2022, and Netherlands and India served as co-leads in launching the Mission Integrated Biorefineries, which brought together important players to speed up innovation for renewable fuels, chemicals, and materials for a low-carbon future.
- India, one of the founding members of the Clean Energy Ministerial (CEM), will organize CEM-14 in Bengaluru in 2023 in conjunction with its G-20 Presidency.
- India is one of the select few nations in the world that has designed a Cooling Action Plan (CAP) with a long-term vision (covering a 20-year timeframe from 2017–2018 to 2037–2018) that addresses cooling requirements across sectors.
- India has made the bold Nationally Determined Contributions (NDCs) commitment to reduce emission intensity by 33–35% from 2005 levels by the year 2030.
- The greatest renewable energy (RE) growth program in the world is being implemented in India, with plans to boost the nation's total RE capacity by a factor of five, from 32 GW in 2014 to 175 GW by 2022, and then to 500 GW by 2030

**4.7 Breakthrough Agenda Report 2022****Context**

- IEA has recently released a report on global greenhouse gas emissions

**About the News:**

- International Energy Agency (IEA) together with the International Renewable Energy Agency (IRENA) and the UN Climate Change High-Level Champions have recently released the first “Breakthrough Agenda Report 2022”.



- The report aims to assess progress on reducing emissions in five key sectors – power, hydrogen, road transport, steel and agriculture.
- It primarily focuses on supporting stronger international collaboration to drive faster reductions in global greenhouse gas emissions.
- The report has also given valuable recommendations including steps for strengthening of collaboration in areas such as common standards, technology R&D, reaching a level playing field for trade, and improving technical and financial assistance.
- Previously, the need for such report was requested by world leaders at the UN Climate Change Conference COP26 at Glasgow in 2021.
- In this regard, the report is designed to inform policy makers, business leaders and civil society the most urgent priorities ahead of the Global Clean Energy Action Forum in Pittsburgh and the next UN Climate Change Conference COP27 in Sharm El-Sheikh, Egypt later this year.

### Major highlights of the report:

#### About:

- The Breakthrough Agenda is part of the mandates under COP-26 and covers more than two-thirds of the global economy, with endorsement from 45 world leaders, including those of the G7, China and India.
- **Bright future:** The report notes an increase in practical international cooperation in recent years, and progress in deploying the technologies needed, including:
  - A doubling of EVs sales in 2021 from the previous year, to a new record of 6.6 million
  - A forecast increase in global renewable capacity of 8% in 2022 – pushing through the 300GW mark for the first time and equivalent to powering approximately 225 million homes

Sectors	Priority	Important findings
Power	To increase the availability and affordability of renewable and low carbon hydrogen such as incentivise investment in production, which must scale up from less than 1 Mt in 2020 to around 140-155 Mt per year by 2030.	<ul style="list-style-type: none"> <li>• Hydrogen production and use accounts for around 0.9 GtCO<sub>2</sub> of emissions, or 1.5% of total emissions.</li> <li>• Renewable and low carbon hydrogen production currently accounts for less than 1% of total.</li> <li>• Targets and commitments to use low carbon and renewable hydrogen are equivalent to 3% of current total hydrogen demand.</li> <li>• 15% of ammonia and 28% of methanol is internationally traded.</li> </ul>
Road transport	Countries and manufacturers should align target dates for all new vehicles to be zero emission, to shift investment more quickly towards the new technologies and accelerate their cost reduction.	<ul style="list-style-type: none"> <li>• The road transport sector accounts for around 6 GtCO<sub>2</sub>e, or 10% of total emissions which need to fall by nearly a 1/3 by 2030.</li> <li>• Public charging infrastructure needs to increase 10-fold by 2030.</li> <li>• If major markets align their policies with 100% ZEV sales by 2035, cost parity between ZEVs and ICE vehicles could be reached several years earlier.</li> <li>• Over 60% of the vehicles added to the roads in Africa each year are imported used vehicles.</li> </ul>
Steel sector	The immediate opportunity is for aggregation of demand to mobilise investment in the production of near-zero emission steel.	<ul style="list-style-type: none"> <li>• The steel sector accounts for around 3 GtCO<sub>2</sub>e of emissions, or 5% of total emissions which need to fall by around ¼ by 2030.</li> <li>• Global average direct emissions intensity of steel production needs to fall by around 30% by 2030.</li> <li>• 114 Mt of conventional, high emission plants are currently underway or in the planning stage.</li> </ul>
Agriculture	It is an immediate priority for international collaboration must be to improve access to finance for smallholder farmers in developing countries – by increasing the flow of public finance, and its leverage of private finance.	<ul style="list-style-type: none"> <li>• Agriculture and related land use accounts for around 10GtCO<sub>2</sub>e, or 17% of total emissions.</li> <li>• Farm-gate emissions have increased by 0.6% per year since 2000. These need to fall by around 20% by 2030 and agricultural expansion needs to halt.</li> <li>• Smallholder farmers produce about 30% of global food production.</li> <li>• 27% of all agriculture and land use emissions can be attributed to agricultural products that are internationally traded.</li> </ul>
Emitting	Countries and businesses should work together in each emitting sector to increase the chances of meeting the Paris Agreement goals, in	<ul style="list-style-type: none"> <li>• Technical and financial assistance must be made more available in all sectors.</li> <li>• In trade-exposed sectors where clean technologies or sustainable solutions are at a cost disadvantage to high emitting technologies or</li> </ul>

sectors	line with the Breakthrough Agenda commitment	<p>practices, level playing fields in international trade will be needed.</p> <ul style="list-style-type: none"> <li>• Coordinated efforts to research, develop and demonstrate technologies can support progress in many sectors.</li> <li>• Coordinated international deployment of low carbon infrastructure such as electricity interconnectors, hydrogen gas pipelines, and refuelling or recharging facilities for shipping, aviation etc.,</li> </ul>
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- Forecast global electricity generation cost reduction of at least USD 55 billion in 2022, based on new renewable capacity added in 2021.
- Strengthened international collaboration in focus sectors:

### Major recommendations:

- Demonstrate and test flexible low-carbon power systems to expand the range of solutions and increase the share of variable renewables
- Create new cross-border super grids this decade to increase trade in low-carbon power, reduce emissions, improve energy security and enhance system flexibility.
- Set up new international centres of expertise to channel finance and technical assistance to help coal-producing countries' transition.
- Agree a common definition and target dates by which all new road vehicles will be net zero, targeting 2035 for cars and vans and the 2040s for heavy duty vehicles.
- Mobilise investment in charging infrastructure, including prioritised assistance for developing countries and harmonise international charging standards to drive investment and accelerate adoption globally.
- Standards to boost the recyclability of batteries and supercharging research into alternative chemistries for batteries to reduce reliance on precious metals, such as cobalt and lithium.
- Government policies and private-sector purchase commitments to drive demand and deployment of low-carbon and renewable hydrogen alongside standards to enable global trade.
- Public and private commitments to purchase near-zero emission steel, and actions to level the playing field between steel producing nations.
- Investment for agriculture technologies and farming practices that can cut emissions from livestock and fertilisers, expand availability of alternative proteins and accelerate the development of climate resilient crops
- International standards for monitoring and reporting on the state of natural resources on which agriculture depends, covering soil health, soil carbon content, and pollinator health.

## 4.8 Holistic Water Management System

### **Context:**

Water consumption has grown significantly as cities have expanded quickly. Water scarcity and depletion are major problems that will soon challenge people, even as desires drive people to move to metropolitan areas.

### **Need for Holistic Water Management System**

- By 2050, it is projected that 50% of India's population will reside in urban regions, up from about 35% in 2020.
- Only 45% of the demand in metropolitan areas is satisfied by groundwater resources. In addition to this, pollution, contamination, and climate change have increased the strain on water resources.
- There are various water management systems in India that address water-related concerns in various localities and are based on utilities including sanitation, urban water, stormwater, and wastewater.
- Since areas and localities define distribution and water allocation, it is often a challenge to find a unified solution.
- Water management must therefore undergo a revolution, and most metropolitan areas have implemented an Integrated Urban Water Management (IUWM) system to assure a stable supply in the future.

### **About Integrated Urban Water Management System**

- IUWM is a process, which ensures water supply, used water management, sanitation and stormwater management can be planned in line with economic development and land use.
- This holistic process makes coordination among water departments easier at the local level.
- It also helps cities adapt to climate changes and manage water supply more efficiently.

### **Approaches to Successful Water Management System**

#### **Collaborative Action**

- It focuses on a collaborative approach involving all stakeholders. Also, it is easily defined and focuses on accountability.
- Engaging local communities will result in quicker solutions for water management, while effective legislation will assist guide local authorities.

#### **Shift in perception of Water**

- Understanding how water is inextricably linked to economic growth, societal infrastructure, and land usage is crucial.

### **Understanding water as a resource**

- Water is a resource for various end goals thus it will be easier to treat different kinds of water based on agricultural, industrial and environmental purposes. Customised Solutions for Different Cities
- IUWM stresses rights-based solutions over one-size-fits-all approach by focusing on specific contexts and regional needs.

### **Challenges**

#### **Inefficient and ineffective management of waste water**

- Due to ineffective wastewater management, India is unable to utilize its resources as cost-effectively as possible in a setting where there is a severe water shortage. Greywater makes up the majority of this water in urban areas.
- The Central Pollution Control Board recently released a report stating that India's current water treatment capacity is 27.3% and its current sewage treatment capacity is 18.6% (with an additional 5.2% capacity being built).

#### **Water Pollution**

- Large amounts of domestic, industrial, and mining waste are dumped into waterways, which might result in waterborne diseases. Eutrophication, which can have a major influence on aquatic ecosystems, is another consequence of water pollution.

#### **Rural-Urban Issues**

- Rapid urbanization is forcing cities to grow quickly, and a big influx of migrants from rural areas has increased the per capita water demand in cities. As a result, water is being moved from rural reservoirs to urban areas to make up the difference.

#### **Overexploitation of Groundwater**

- According to the Central Ground Water Board's most recent research, 256 of India's 700 districts are identified with critical or overexploited groundwater levels.
- According to an NITI Aayog analysis, 21 cities, including Bangalore, Delhi, Hyderabad, and Chennai, will likely have used up all of their groundwater resources by 2021, making this India's biggest water crisis in history.
- Groundwater resources are under increasing strain as a result of overuse and unsustainable usage, leading to the drying up of wells, ponds, and storage tanks. The water issue has worsened as a result.

#### **Government Initiatives**

- Swachh Bharat Mission
- Jal Jeewan Mission
- Sujalam 2.0
- Atal Bhujal Yojana



#### 4.9 Madhav National Park

**Context:**

- The National Tiger Conservation Authority (NTCA) has given nod to relocate five tigers from three national parks of Madhya Pradesh to Madhav National Park.
- Madhav National Park is situated in Shivpuri District, Madhya Pradesh and is a part of the upper Vindhyan hills.
- The Park was the hunting ground of Mughal emperors and Maharaja of Gwalior which later got the status of a National Park in 1959.
- It has a diverse ecosystem consisting of lakes, dry deciduous & dry thorn forests. The forest is home to tigers, leopards, Nilgai, and Chinkara (*Gazella bennettii*) and Chousingha (*Tetracerus quadricornis*) and Deers (Chital, Sambar and Barking Deer) among others.
- The Park falls within one of the 32 major Tiger Corridors of the country, which are operationalised through the Tiger Conservation Plan (implemented under the Wildlife Protection Act 1972).
- Madhav National Park is a part of the Ranthambhore-Kuno-Madhav (Madhya Pradesh and Rajasthan) Tiger Corridor of Central India & Eastern Ghats landscape.
- The Park is currently facing displacement and rehabilitation issues as it is home to Particularly Vulnerable Tribal Groups (PVTGs).
- Other National Parks in Madhya Pradesh: Bandhavgarh, Kanha NP, Pench (Priyadarshini) NP, Panna NP, Mandla Plant Fossils NP, Sanjay NP, Satpura NP, Van Vihar NP

#### 4.10 'Neelakurinji' Bloom

**Context:**

- The Neelakurinji flowers have turned the green patches of Bababudangiri range of the Western Ghats (Chandradrona Mountains) into purple-blue.

**About Neelakurinji Flower**

- It is a shrub of the Acanthaceae family that famously blooms once every 12 years.
- It is endemic to Western Ghats, covering the slopes of Kerala, Karnataka and Tamil Nadu.
- Their scientific name is 'strobilanthes kunthiana',
- Strobilanthes is a genus of about 350 species of flowering plants in the family Acanthaceae, mostly native to tropical Asia and Madagascar.
- The Topli Karvy (*Strobilanthes sessilis*), the Karvy (*Strobilanthes callosa*) and the Kurinji (*Strobilanthes kunthiana*), all belong to the Strobilanthes genus.

- The Topli Karvy is found more in the northern section of the Western Ghats in Maharashtra.
- The Karvy grows on the steepest cliffs where trees can't grow.
- They are seen mostly on the Nilgiri hills, which even got its name from the flowers -- 'neela', meaning blue and 'kuringi', referring to the flowers

#### **4.11 Flex Fuel Vehicles**

##### **Context:**

- India is all set to get its first flex-fuel car by Toyota powered by flex-fuel.
- Flex Fuel Vehicles are not confined to a certain kind of fuel and can flexibly run on a blend of petrol and ethanol up to 83%.
- FFVs are more efficient and show improved acceleration performance when they are fuelled with higher ethanol blends, according to the US Department of Energy, and they are already available in countries such as Brazil, the US and Canada.
- Prime benefits of flex-fuel car owners over petrol car owners are that they can switch to ethanol whenever they want, thus shielding them from highly volatile fuel prices.
- The 'National Policy on Biofuels' notified by the Government in 2018 targeted the introduction of E20 flex-fuel (80 percent petrol, 20 per cent ethanol) by 2030 (now 2023) and 5% blending of biodiesel in diesel by 2030
- As per the new regulation automakers will be compelled to manufacture engines compatible with the fuel.
- Since India is one of the largest sugarcane producers, it has great potential to produce enormous amounts of ethanol.
- As of now, ethanol is way cheaper than petrol in India, providing scope for the flex fuel car owners to use the fuel to save on their fuel bills. It will also help India in reducing its dependence on fuel imports.

#### **4.12 Biomass Co-firing**

**Context:** The Ministry of Power is considering to cut coal supply to plants, which do not comply with biomass cofiring Norms.

- Biomass co-firing is the practice of substituting a part of the fuel with biomass at coal thermal plants.
- Substituting 5-7 % of coal with biomass in coal-based power plants can save 38 million tonnes of carbon dioxide emissions.
- Co-firing is an option to convert biomass to electricity, in an efficient and clean way, and to reduce GHG emissions of the power plant.
- Coal and biomass are combusted together in boilers that have been designed to burn coal. For this purpose, the existing coal power plant has to be partly reconstructed and retrofitted.
- Biomass co-firing is a globally accepted cost-effective method for decarbonising a coal fleets.

- It can help cut emissions from combustion of fossil fuels, address India's burgeoning problem of farm stubble burning to some extent, reduce waste burden while also creating jobs in rural areas.
- However, the existing infrastructure is not robust enough to substitute 5-7% of coal with biomass in coal-based power plants.
- Around 95,000-96,000 tonnes of biomass pellets are required per day for co-firing, but India's pellet manufacturing capacity is 7,000 tonnes per day at present despite a surplus 228 million tonnes of agricultural residue available in the country.

#### **4.13 Carbon Dots**

**Context:** The use of modern technology like nanomaterials or Carbon Dots (CD) may offer solutions to environmental issues like water pollution.

- Carbon quantum dots, also commonly called Carbon dots, are carbon nanoparticles which are less than 10 nm in size and have some form of surface passivation and were discovered in 2004.
- CDs are one of the youngest members of the carbon nanomaterial family.
- CDs possess remarkable optical properties, which differ peculiarly based on the precursor used for synthesis.

#### **Properties of CDs include:**

- They can be both synthetic and natural.
- They are highly soluble in water.
- They were also proven to be fluorescent sensors to detect pretilachlor herbicide causing trouble in aquatic bodies. In other words, they are an alternative to deal with algal bloom.
- Moreover, CDs are inexpensive, highly biocompatible, and environment-friendly (pollutant sensing, contaminant adsorption, water treatment, pollutant degradation, and antimicrobial mechanisms are its other uses)

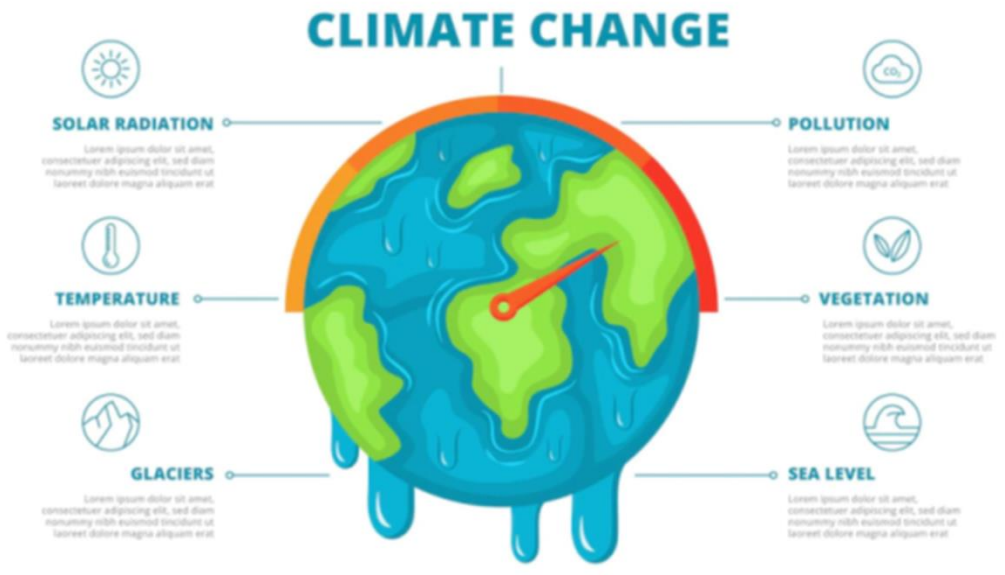
#### **4.14 Five Tipping Points and Climate Change**

##### **Context:**

Scientists have recently warned of lock in unstoppable changes to the planet owing to climate change

##### **About the news**

- In a recent study of the last 15 years of research, scientists have analysed five tipping points occurring at the current global warming level of approximately 1.2°C.
- Continued greenhouse gas emissions has been the triggering climate tipping points with self-sustaining shifts in the climate system that would lock-in devastating changes, like sea-level rise, even if all emissions ended.



- Climate change has resulted in tip and transition to a savannah-like state first, bypassing a more catastrophic dieback across the whole forest along small patches of the Amazon and northern forests.
- The first major assessment was done in 2008 which identified nine parts of the climate system that are sensitive to tipping, including ice sheets, ocean currents permafrost around the Arctic and major forests.
- The findings are important to strengthen the case for ambitious emissions cuts in line with the Paris agreement's aim of halting warming at 1.5°C.

### Major findings:

- **Uncertain thresholds:** Synthesised results of more than 200 studies estimates that warming thresholds for each tipping element as global warming exceeds 1.5°C, four of these five become increasingly probable.
- **Shrinking sheets:** Records shows ice sheets had retreated in the past and modelling studies indicate the Greenland and west Antarctic ice sheet is likely to collapse beyond 1.5°C than those for abrupt permafrost thaw.
- **Duration:** Ice sheets being massive the change will be very slowly and collapse would take thousands of years, and the processes driving it require warming to remain beyond the threshold for several decades.
- **Scope of retreat:** If warming returned below the threshold before tipping kicked in, it may be possible for ice sheets to temporarily overshoot their thresholds without collapsing.
- **Spread:** Change is likely to be more dispersed with both tropical coral reef death and abrupt permafrost thaw thresholds becoming much more widespread at a similar time beyond 1.5°C.
- **Global phenomenon:** Ocean currents in the North Atlantic can dramatically flip from being strong, as they are now to weak as a result of both warming and melting freshwater from Greenland disrupting circulation.
- **Danger zone:** Degradation and drought will cause parts of the Amazon to become less resilient to disturbances like fire and will emit more carbon than they absorb.

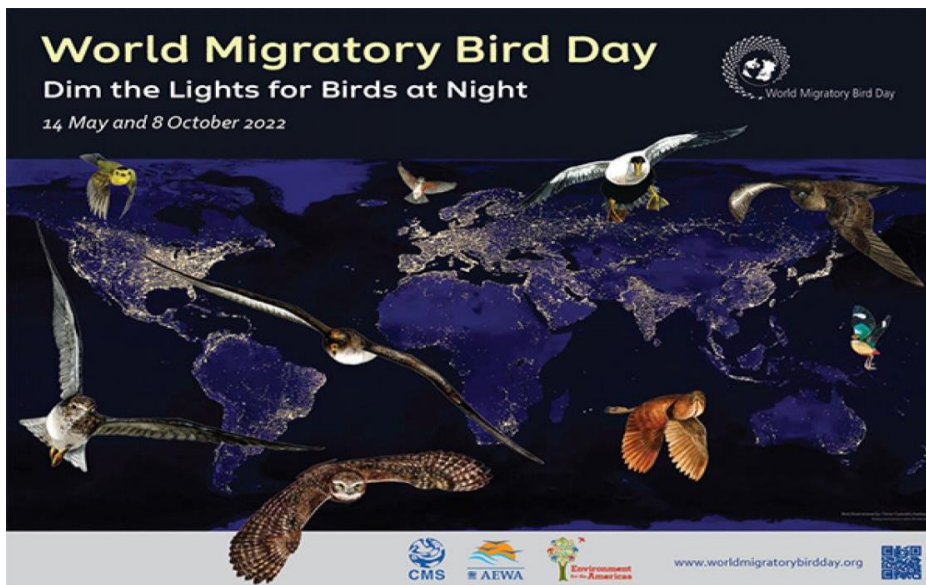
#### 4.15 Light Pollution and Migratory Birds

##### In News:

The World Migratory Bird Day was recently celebrated.

##### About World Migratory Bird Day

- It is a bi-annual global awareness campaign designed to increase public understanding of migrating birds, the necessity for their protection, and the significance of protecting their habitat.
- It is celebrated on the second Saturday in May (14 May this year) and then in October (8 October this year).



- The Convention on the Conservation of Migratory Species of Wild Animals (CMS) and the African-Eurasian Migratory Waterbird Agreement (AEWA), as well as the non-profit group Environment for the Americas (EFTA), collaborates to organize WMBD.
- Other committed groups, such as Bird Life International (BLI) and the East Asian Australasian Flyway Partnership (EAAFP), are also actively supporting the 2022 worldwide effort.

##### Theme

- "Light Pollution" is the focus of World Migratory Bird Day in 2022.
- In WMBD 2022, the growing problem of light pollution's effects on these birds and efforts to ensure their safe migration are addressed.

##### Significant dangers to migratory birds are brought on by artificial lighting, including:

- Night-time flying distortion
- Collisions involving buildings
- Disruptions to both their Biological clock and their capacity for long-distance migration.
- Risk of exhaustion, predation and lethal collision with buildings and other man-made infrastructure.

## What is Light Pollution?

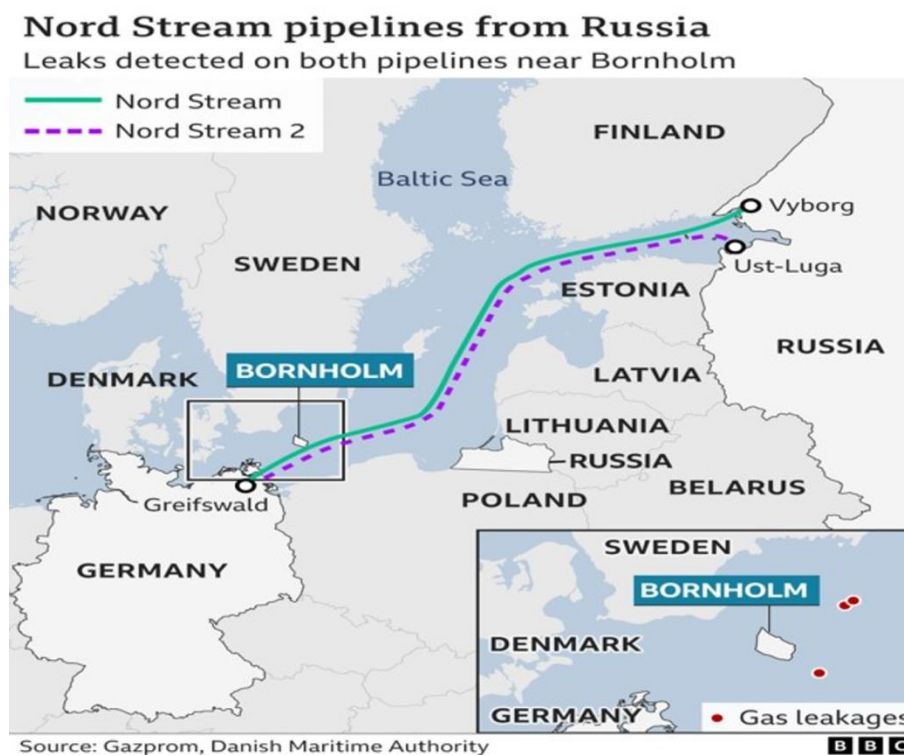
- Light pollution, according to CMS, is defined as "artificial light that alters ecosystems' normal rhythms of light and dark."
- Over the course of the day and night, artificial lighting is used more frequently. Outdoor artificial lighting climbed by 2.2% year from 2012 to 2016; by 2022, this increase might be significantly higher.
- Today, close to 99% of people in Europe and North America and over 80% of the world's population live beneath a "lit sky."

### 4.16 Nord Stream Pipeline

#### Context:

There has been a gas leak at the Nord Stream 2 pipeline recently.

- Two pipelines, each with two lines, make up the Nord Stream system.
- Nord Stream 1 is an underwater pipeline through the Baltic Sea that carries natural gas from Russia to Germany.



- Its twin, Nord Stream 2, whose commissioning got cancelled after Russia's invasion of Ukraine, had been filled with gas, in anticipation of exports commencing from the fully built pipeline.
- Nord Stream 1 was finished in 2011 and connects Lubmin near Greifswald, Germany, to Vyborg in Leningrad, Russia.
- The Nord Stream 2 pipeline, which connects Ust-Luga in Leningrad with Lubmin, was finished in September 2021 and, when fully operational, has the potential to transport 55 billion cubic meters of gas annually.
- Together, the twin pipelines can provide 110 billion cubic meters (bcm) of gas to Europe per year for at least 50 years.



- The Nord Stream crosses numerous nations' Exclusive Economic Zones (EEZs), including those of Finland, Sweden, Denmark, and Germany, as well as through territorial waters of Russia, Denmark and Germany.
- The pipeline connects the OPAL (Baltic Sea Pipeline) and NEL (North European Pipeline) in Germany, which connects to the European grid as well.



## 5. SCIENCE & TECHNOLOGY

### 5.1 5G services in India

5G telephony service was rolled out by Prime Minister Narendra Modi at the 6<sup>th</sup> Edition of India Mobile Congress 2022 organized at Pragati Maidan in New Delhi.



#### Key facts

- The 5G services in India will be launched in a phased manner.
- Initially, it will be launched in 13 cities across India. These include Delhi, Bengaluru, Mumbai, Chennai, Ahmedabad, Chandigarh, Gandhinagar, Hyderabad, Kolkata, Lucknow, Pune, Jamnagar and Gurugram.
- Important metro cities like Chennai, Mumbai, Delhi and Kolkata will be first to receive the 5G service. Reliance Jio is planning the rollout by Diwali.
- The rest of the country will receive the next generation network by December 2023.

#### What is 5G?

- The 5<sup>th</sup> generation mobile network (5G) is a global wireless standard that provides 10 times faster internet speed than 4G network. It provides a maximum data speed of 20 Gbps per second or more than 100Mbps per second. This ensures high data rate, reliable communication and low latency (minimum delay). It will help connect billions of IoT devices, improve the quality of streaming and improve important services such as telesurgery and autonomous cars. It will enable real-time monitoring of disasters, improve precision agriculture, automate hazardous industrial operations like offshore and deep mining.

#### About India Mobile Congress 2022

- India Mobile Congress (IMC) 2022 is being held from October 1 to 4 this year. It is organized with the theme “New digital Universe”. Inaugurated by Prime Minister Modi, this event brings together government, experts and major technology, media and entertainment, and telecommunications (TMT)

companies. It is a major networking event in India's technology sector. The event acts as the largest TMT forum in Asia. It is jointly organized by the Indian Government's Telecom Department and the Cellular Operators Association of India (COAI). During the event, unique and new opportunities will be showcased for the speedy adoption and spread of digital technology.

## 5.2 India's first 5-G Test Bed- Key Facts

- Prime Minister Narendra Modi recently inaugurated India's first 5G testbed, which is set up at Rs 220 crore.



### **What is the objective of establishing a 5G testbed?**

- The objective is to enable the telecom industry to test and validate their products within India and reduce their dependence on facilities abroad. Thus, this 5G testbed is an important step in India's self-reliance in the area of modern technologies. The 5G testbed facility will be available at 5 different locations in the country.
- Recently, Union IT minister Ashwini Vaishnaw made India's first 5G call at IIT Madras, which is one of the biggest moments for India's first 5G testbed. This test call was operated on the mid-tier spectrums of the High 5G Frequency Bands.

### **Which institutes were involved in the 5G testbed project?**

- The 5G testbed is a multi-stakeholder collaborative project by eight institutes and led by IIT Madras. The other seven institutes are IIT Delhi, IIT Hyderabad, IIT Bombay, IIT Kanpur, IISc Bangalore, and Society for Applied Microwave Electronics Engineering & Research (SAMEER) and Centre of Excellence in Wireless Technology (CEWiT).

### **What are the benefits of 5G technology?**

- The advantages of the 5G network include better call connectivity, better voice clarity, reduction in call drops, quick connections, etc. It is estimated that 5G technology will contribute USD 450 billion to India's economy in the next decade.

### 5.3 Extension of Telecom PLI scheme

The Department of Telecommunication (DoT) has amended the Production Linked Incentive (PLI) scheme for promoting telecom and networking products manufacturing, based on the feedback of stakeholders.



#### What are the amendments?

- DoT has extended the scheme by one year.
- It has announced an additional 1% incentive rate, over and above the existing rates.
- Existing PLI beneficiaries will have an option to select either financial year 2021-22 or financial year 2022-23 as first year of incentive.
- 11 new telecom and networking products has been approved to the existing list, on the basis of suggestions of stakeholders.
- Guidelines for PLI Scheme for Telecom & Networking Products have also been amended, in order to introduce Design-led Manufacturing along with additional incentive rates.
- Allocation for MSMEs has been increased from Rs 1000 crore to Rs 2,500 crore.

#### Design-led manufacturing

- For the promotion of design-led manufacturing, telecom department has invited applications from Design-led manufacturers others, to avail incentives under PLI Scheme for five years starting from April 1, 2022.

#### Which investments are eligible?

- Investment by successful applicants in India from April 1, 2022 to Financial Year 2025-2026 shall be eligible. Eligibility is subject to qualifying incremental annual thresholds.

#### Who can apply for the scheme?

- MSME and Non-MSME companies, including domestic and global, are allowed to apply to the scheme. However, applications from Design-led manufacturers will be given priority over manufacturers, while shortlisting them.

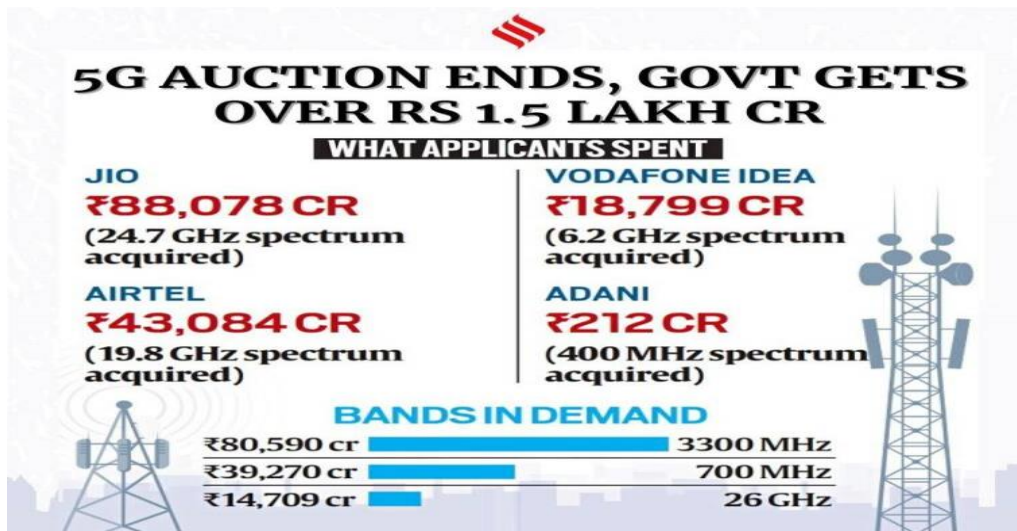
### Minimum investment threshold

- The minimum investment threshold under the scheme is Rs 10 crore for MSMEs while Rs 100 crores for non-MSMEs applicants. Land and building costs will not be counted under investments. Eligibility of the investment is subject to incremental sales of manufactured goods over base year FY 2019-20.

### When will registration start?

- Applicants can start the registration process for the scheme from June 21, 2022. Application window stands open for 30 days. Registration will end on July 20, 2022.

## 5.4 5G spectrum auction: All you need to know about India's biggest Spectrum Auction



India started its biggest-ever spectrum auction, involving telephone and internet data signals. Under the spectrum process, 72 GHz (gigahertz) of 5G airwaves have been put on offer at the cost of Rs 4.3 lakh crore.

### Significance of the 5G spectrum includes:

- Fifth generation or 5G spectrum offers ultra-high speeds, which is 10 times more than the speed of 4G.
- It will also provide lag-free connectivity.
- It would finally enable connected devices to share data in real-time.
- 5G spectrum also powers the ultra-low latency connections, allowing the download of full-length high-quality movie or video on a mobile device in few seconds.
- It will also enable solutions like e-health, life-saving use cases, connected vehicles, advanced mobile cloud gaming and immersive augmented reality & metaverse experiences.

### Bidding process has started in which,

- Reliance Jio, Bharati Airtel, Adani Enterprises and Vodafone Idea are ready to bid for 5G spectrum.
- Auction is being held for spectrum in three bands:
  - Low Frequency Band:** 600 MHz, 700 MHz, 800 MHz, 900 MHz, 1800 MHz, 2100 MHz, 2300 MHz



**2. Mid Frequency Band: 3300 MHz****3. High Frequency Band: 26 GHz**

- Bidding started on July 26 and will continue for the next day as well, if there is a demand for spectrum and bidders are ready to put in bids.
- The 5G spectrum is likely to be rolled out by September 2022. Initially, 5G spectrum would be rolled out in phases and will stay limited to metros and larger cities, because just 7% of overall smartphone base in India, is 5G-enabled.

**5.5 Hughes-ISRO satellite internet service**

Hughes Communications India (HCI) and ISRO has jointly launched India's first high-throughput satellite (HTS) broadband service.



- HCI – a joint venture company of US-based Hughes Network Systems and Indian telecom operator Bharati Airtel – launched the first high throughput satellite broadband internet service in India.
- This service would provide satellite internet to remote parts of India by using ISRO's GSAT-11 and GSAT-29 satellites.
- ISRO launched the GSAT-11 and GSAT-29 in 2018 to provide higher bandwidth satellite connectivity to Indian clients in the space enterprise. The GSAT-11 is capable of providing up to 14 Gbps through satellite network.
- The newly launched HTS broadband service aims to provide high-speed broadband in regions that are inaccessible for terrestrial networks.
- For the past one year, this high-speed internet service was tested in several regions such as Jammu and Kashmir and Himachal Pradesh, which lack terrestrial connectivity because of challenges posed by terrains.
- The newly launched satellite internet service is capable of providing internet connectivity bandwidth of up to 100 Mbps – about 2GB data per day.

- It supports services such as Wi-Fi hotspots for community internet access, SD-WAN solutions, backhaul to extend mobile network reach and satellite internet for small businesses.
- The application of this satellite connectivity is currently limited to fringe markets such as remote locations.
- India currently does not have the market for very high bandwidth satellite internet in such regions and high bandwidth internet are already served by terrestrial network in other places that are having high demands for internet services.
- The Hughes' HTS service already has clients like Reliance Jio, State Bank of India and others.
- Jio utilizes Hughes' service for 4G backhaul to provide services to remote locations for its terrestrial telecom networks.
- SBI uses this satellite internet service for providing connectivity to remote bank branches and automated teller machine (ATM) outlets.

### **High-throughput satellite**

- High-throughput satellite (HTS) is a satellite connectivity that provides higher bandwidth, which increases the amount of data that can be transferred between a satellite and a ground station. A conventional satellite connectivity has low bandwidth and high latency of connectivity – time taken to transfer data between a sender and receiver. The HTS seeks to address this issue.

### **5.6 Draft Indian Telecommunications Bill, 2022**

Draft Indian Telecommunications Bill, 2022 was unveiled recently by the Department of Telecommunications for stakeholders' comments.



### **Key features**

- The objective of the draft bill is to consolidate and make changes to existing laws for the development, expansion and operation of telecommunication services, telecom networks and infrastructure in India.
- It merges three Acts that govern the Indian telecom sector. They are Indian Telegraph Act 1885, Indian Wireless Telegraphy Act 1933, and The Telegraph Wires, (Unlawful Protection) Act 1950.

- The draft bill proposes to include over-the-top (OTT) communication services like WhatsApp, Signal and Telegram under the definition of telecommunication services.
- This means that OTT communication services will be subjected to rules followed by telecom operators, which forces operators to incur high costs of licensing and spectrum. Currently, OTT players are providing free services due to the lack of this provision.
- The draft bill also amends the Telecom Regulatory Authority of India Act to dilute TRAI's function to being just recommendatory body. Currently, the telecom department is mandated to seek TRAI's recommendation before issuing a license to a service provider. The Bill also removes legal provision requiring TRAI to request the government to provide necessary information or document to make this recommendation.
- The draft bill also proposes that the Central Government can gain control of the spectrum assigned to a telecom entity that is going through bankruptcy or insolvency. Currently, there is no specifications on whether the spectrum owned by a defaulting operator belongs to the Central Government or if the banks can take control of it.
- The draft bill provides the Central Government the power to postpone, convert into equity, write off or grant relief to any licensee under extraordinary circumstances like financial stress, consumer interest and maintaining competition etc.
- It also proposes to replace the Universal Service Obligation Fund (USOF) with the Telecommunication Development Fund (TDF). The USOF is a fund generated by charging 5 per cent Universal Service Levy upon all telecom fund operators on their Adjusted Gross Revenue. This fund has been used for providing rural connectivity. The purpose of the TDF seeks to expand the scope of USOF to include undeserved urban regions, research and development, skill development etc.

### **5.7 OneWeb-NewSpace India Partnership**

OneWeb's 36 Gen 1 low-earth orbit (LEO) satellites will be launched aboard ISRO's GSLV-Mk III.



#### **Key facts**

- In April 2022, the London-based satellite communications satellite company OneWeb entered into a partnership with the NewSpace India Limited – the commercial arm of ISRO.



- As part of this deal, the 14th launch of the company's LEO satellites will take place aboard GSLV-Mk III – the Indian space agency's heaviest rocket.
- The satellites will be launched from the Satish Dhawan Space Centre (SDSC) in Sriharikota.

### **OneWeb Satellite Constellation**

- The OneWeb satellite constellation is a proposed network of Gen 1 low-earth orbit (LEO) satellites that will provide high data throughput, low latency and global internet coverage. The satellites will remain close to the Earth's surface at an altitude of less than 1,000 km. the first 6 of these satellites were launched in 2019 off the coast of French Guiana aboard a Russian Soyuz rocket. The latest launch involved 34 satellites lifting off to the orbit in February 2022. With this, there are a total of 428 OneWeb satellites in space. 66 per cent of the network has been completed after this launch. OneWeb was planning to launch satellites in March from Kazakhstan's Baikonur Cosmodrome, a launch site leased by Russia. However, it was postponed because of Ukraine war. OneWeb is expected to complete setting up the global broadband internet service by the end of 2023.

### **About NSIL**

- NewSpace India Limited (NSIL) is ISRO's commercial arm that was incorporated in March 2019. It comes under the aegis of the Indian Government's Department of Space (DOS). Its purpose is to realize business demands in the space sector. These include building indigenous launch vehicles through collaborations with Indian firms, transferring technology, providing launch services, satellite building and other ground services as well as satellite-based services. Its main objective is to make India a high-technology manufacturing hub for space-related initiatives.

## **5.8 Svante Pääbo receives Nobel Prize in Medicine**

Svante Pääbo was conferred the Nobel Prize in Medicine



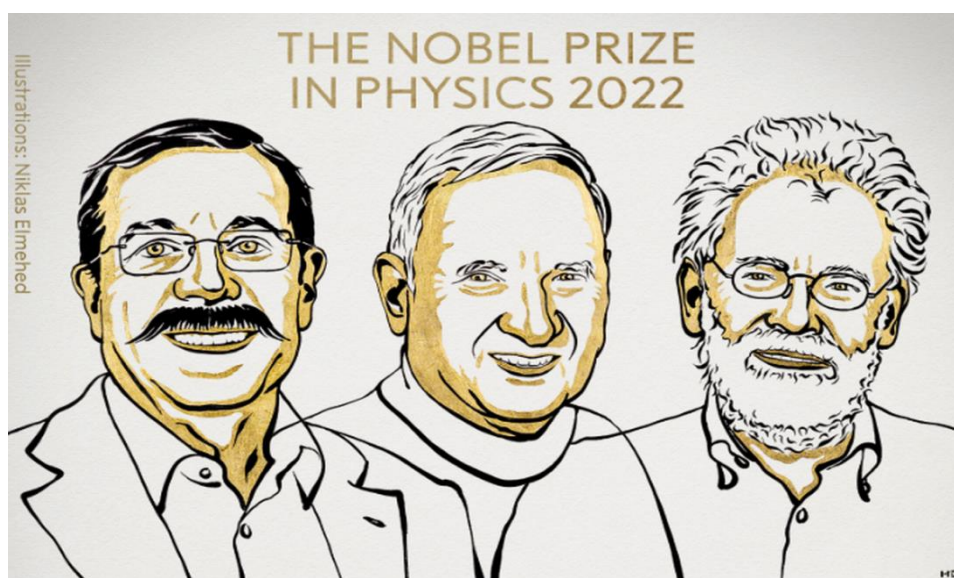
### **Key facts**

- Svante Pääbo received the Nobel Prize in Medicine for his pioneering works in the field of paleogenomics – a branch of science dealing with the reconstruction and analysis of genomic information obtained extinct species.

- The most notable achievements of this Swedish geneticist is the sequencing of the entire genome of Neanderthal and the discovery of Denisova – an extinct hominin species.
- He also discovered that genes from the extinct hominins were transferred to Homo Sapiens after they left Africa some 70,000 years ago.
- This discovery of Denisova has modern significance since, the EPAS1 gene found in these hominins was found to provide the capacity to survive in high altitude. This gene is common among Tibetans.
- As a postdoctoral student, Pääbo helped in the development of methods to conduct scientific research of deoxyribonucleic acid (DNA) from Neanderthals in collaboration with Allan Wilson, major pioneer in the field of human evolution.
- Pääbo continued the research on archaic DNA in 1990, when he was recruited as a professor in the University of Munich.
- He was able to sequence a part of mitochondrial genome from a 40,000-year-old piece of bone using the methods he refined.
- The use of mitochondrial genome increases the chances of success because it exists in thousands of copies.
- His research provided the access to a genome sequence from an extinct human relative for the first time.
- This genome was compared with the modern-day humans and chimpanzees and it was found that Neanderthal was genetically unique from these two species.
- Pääbo was also able to successfully sequence the nuclear genomes of Neanderthal and publish it in 2010 at the New Max Planck Institute in Leipzig, Germany.
- This led to discovery that the most recent common ancestor of Neanderthal and present-day humans roamed the Earth 800,000 years ago

### 5.9 2022 Nobel Prize in Physics

2022 Nobel Prize in Physics was conferred to scientists Alain Aspect, John Clauser and Anton Zeilinger for the research in the field of quantum mechanics.



**Key facts**

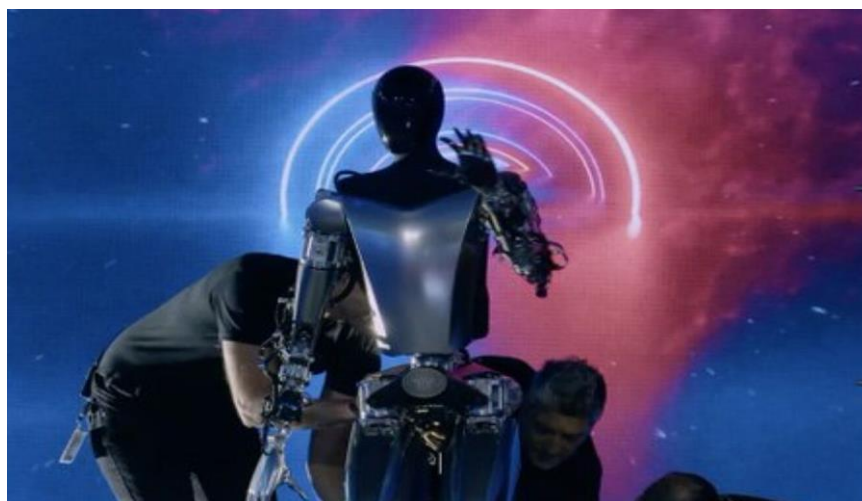
- Alain Aspect, John Clauser and Anton Zeilinger won the Nobel Prize for their contribution towards the advancement in the understanding of subatomic particles' behaviour
- Their four-decade long research provided solid scientific proof that “entanglement” phenomenon observed in quantum particles are real and not caused by “hidden” or “unknown” forces and that they can be used to achieve technological advancements in computing, secure communications and achieving sci-fi concept of teleportation.
- The American scientist John Clauser was the first to conduct experiment testing entanglement. His study concluded that entanglement violates the Bell's inequality. However, sceptics pointed out that certain aspects of the experiment could have caused a favourable result.
- Alain Aspect has improved Clauser's technique and removed loopholes the critics had found. His experiment's conclusion also violated Bell's inequality.
- Anton Zeilinger and his colleagues have successfully exploited entanglement properties for technological purposes. Zeilinger's experiment demonstrated for the first time that teleportation of quantum particles is possible without shifting the particle anywhere and in the absence of a medium.
- These experiments have demonstrated that entanglement is real and can be backed by the Quantum Theory. However, the satisfactory theoretical explanation of the phenomenon is still absent.

**About Nobel Prize in Physics**

- The Nobel Prize in Physics was conferred to 221 Nobel Prize laureates between the years 1901 to 2022. John Bardeen is the only individual to receive this prestigious award twice, in 1956 to 1972. It is bestowed by the Royal Swedish Academy of Sciences to give recognition to those who have made noteworthy contributions for humanity in the field of physics. The first to receive this award was German scientist Wilhelm Roentgen for the discovery of X-rays.

**5.10 Optimus Tesla's humanoid robot**

Tesla CEO Elon Musk recently unveiled the latest prototype of Optimus – a humanoid robot developed by the American company based in Texas.



**Key facts**

- The prototype of Optimus was showcased during the annual Tesla AI [artificial intelligence] Day presentation.
- The humanoid robot demonstrated the ability to perform simple tasks like watering plants, carrying boxes and lifting metal bars.
- Its purpose is to replace a human tasks with a machine.
- This robot shares some of the artificial intelligence software and sensors with the Tesla cars' autopilot driver assistance features.
- The mass production of these robots will cost less than 20,000 USD.
- The design of the robot mimics the human anatomy, with five independently moving fingers capable of grasping adaptively with high precision. This enables it to use tools in an accurate manner.
- This robot has a uniquely designed actuators – a complex set of gears, motors, sensors and controls that act like human muscles. There are a total of 6 actuators, which minimizes the cost, eases the manufacturing process, speed, torque, mass and efficiency.
- Since it is powered by AI software, it has high cognitive ability of perceiving, planning and navigating the world. This is significant since other humanoid robot do not have this capacity.
- It was developed within a year, while other similar robots were developed after more than 10 years of efforts. This feat was achieved by integrating the technology used for self-driving cars into a humanoid body.
- It is using the same AI technology behind Tesla's FSD technology (a driver assistance software requiring comparatively less driver input) to guide the robot.
- The robot will be trained by a custom data centre technology called Dojo, which is under development by Tesla. Dojo is a supercomputer that provides video training using video data obtained from Tesla vehicles.

**What is Optimus?**

- Optimus is a humanoid robot developed by the American company Tesla.

**What can Optimus do?**

Optimus is a humanoid robot that can perform simple tasks like watering plants, carrying boxes and lifting metal bars.

**How Optimus is different from other humanoid robots?**

Optimus has cognitive ability of perceiving, planning and navigating the world

**Which technology will train Optimus?**

Optimus will be trained by a custom data centre technology called Dojo.

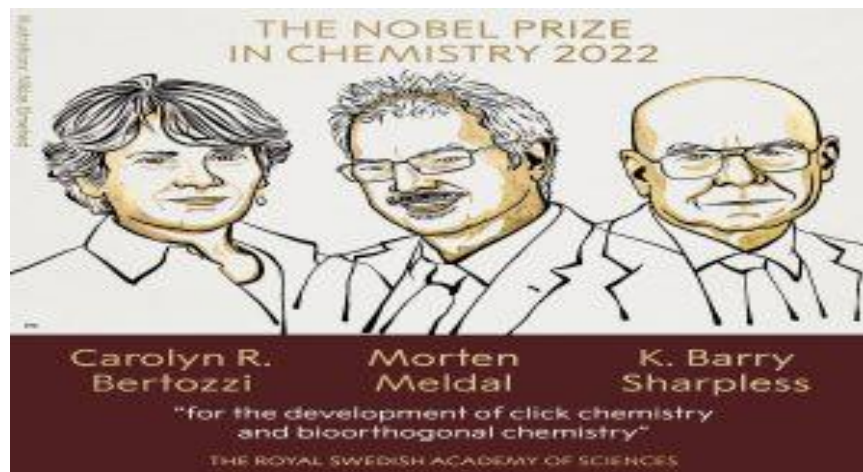


## What is Dojo?

Dojo is a supercomputer that provides video training using video data obtained from Tesla vehicles

### 5.11 Nobel Prize in Chemistry 2022

Nobel Prize in Chemistry was recently conferred to Barry Sharpless, Morten Meldal and Carolyn Bertozzi.



#### Key facts

- Carolyn Bertozzi and Barry Sharpless from the United States and Morten Meldal from Denmark received the Nobel Prize for pioneering the new field of Click Chemistry and demonstrating its potential in pharmaceutical and other sectors.
- They have discovered reactions that allows molecules to snap together, enabling the creation of new compounds and providing insights into cell biology.
- With the recent Nobel Prize, Dr. Sharpless became one of the few scientists to receive two Nobel Prizes. He won the prestigious award earlier in 2001. The other laureates to receive Nobel Prize twice include John Bardeen who won for physics twice, Marie Curie who received awards for physics and chemistry, Linus Pauling who received the award for peace and chemistry and Fredrick Sanger, who won the chemistry twice.
- Dr Meldal and Dr Sharpless (independently of each other) achieved the copper-catalysed azide-alkyne cycloaddition (CuAAC) reaction, which is popularly used in fields like medical chemistry.
- Bertozzi improved the field of click chemistry by making click reactions work inside living organisms. These bioorthogonal reactions do not affect normal chemistry of the cell.

#### What is click chemistry?

- Dr. Sharpless pioneered the field of click chemistry – a functional field where molecules are snapped (clicked) together quickly and effectively for achieving reactions that ensure rapid synthesis of drug-like molecules that can hasten the drug discovery process using practical and reliable reactions. Click reaction uses only easily available reagents and is insensitive to water and oxygen. It provides synthetic alternatives instead of trying to imitate naturally occurring compounds. Replicating natural reactions require bonds between carbon atoms, which often results in side reactions and loss of materials. The

click chemistry addresses this issue by using smaller molecules having complete carbon frame, which are further linked using oxygen or nitrogen as bridges. These simple reactions may avoid the loss of material and prevent unnecessary side reactions.

### 5.12 Chandrayaan-2 maps sodium content on Moon's surface



#### **Key facts**

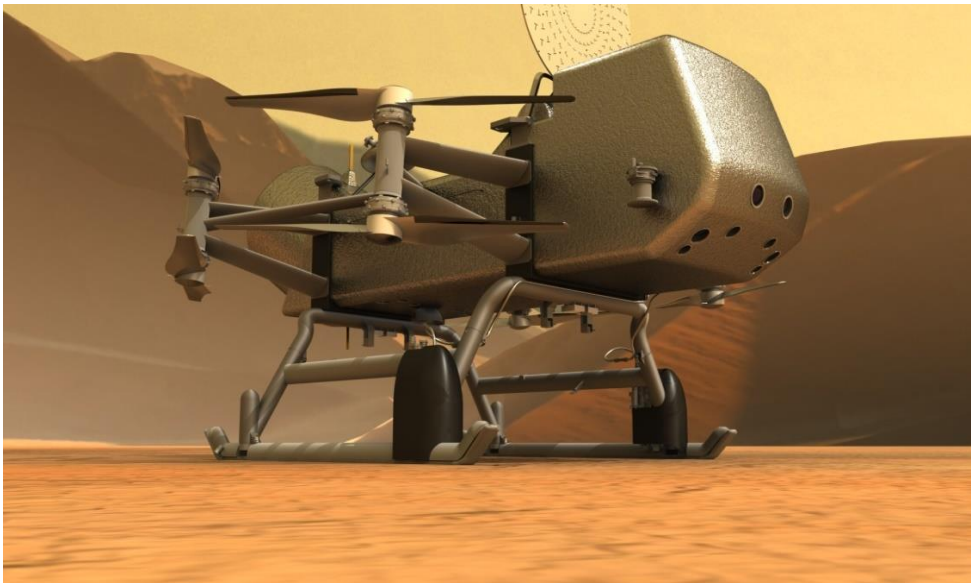
- The x-ray spectrometer called CLASS (Chandrayaan-2 Large Area Soft X-ray Spectrometer) aboard the Chandrayaan-2 Orbiter detected a large amount of sodium on the moon for the first time.
- Earlier, Chandrayaan-1 X-ray Fluorescence Spectrometer (C1XS) opened up the possibility of large amount of sodium on the Moon by detecting the element's characteristic line in X-rays.
- CLASS spectrometer, due to its improved capability and sensitivity, was able to provide clean signature of the sodium line.
- The new research found that a part of the signal could be detected from a thin veneer of sodium atoms that is weakly bound to the lunar grains on the surface.
- Sodium is found in the Moon's exosphere, where atoms rarely interact. The exosphere begins at the lunar surface and spans across several thousand kilometres before merging into the interplanetary space.
- If sodium atoms are part of the lunar minerals, they can easily be pushed out of the surface by the UV rays or solar winds.
- The diurnal variation of the alkali element on the surface explains its continuous supply and presence in the exosphere.
- Currently, sodium and potassium are the only elements that can be observed through telescopes in the lunar atmosphere (exosphere).
- The new findings by the Chandrayaan-2 provides scope to study the interactions between the lunar surface and exosphere. This could help in the development of similar models for Mercury and other airless celestial bodies in the solar system.
- The recent study is the first shot towards a global-scale measurement of sodium on the lunar surface using X-ray florescent spectra.

### About X-ray fluorescence

- X-ray fluorescence is commonly used to find the composition of minerals in a non-destructive manner. It is triggered when solar flares (a large amount of X-ray radiation) falls on the lunar surface. The CLASS spectrometer measures the energy of the X-ray photons emitted from the moon and counts the total number. The photon's energy indicates the element's atom and its intensity is used to measure of the number of atoms present.

### 5.13 NASA's Dragonfly rotorcraft

Dragonfly rotorcraft will be launched by the American space agency in 2027 to study Titan – the largest moon of Saturn.



#### Key facts

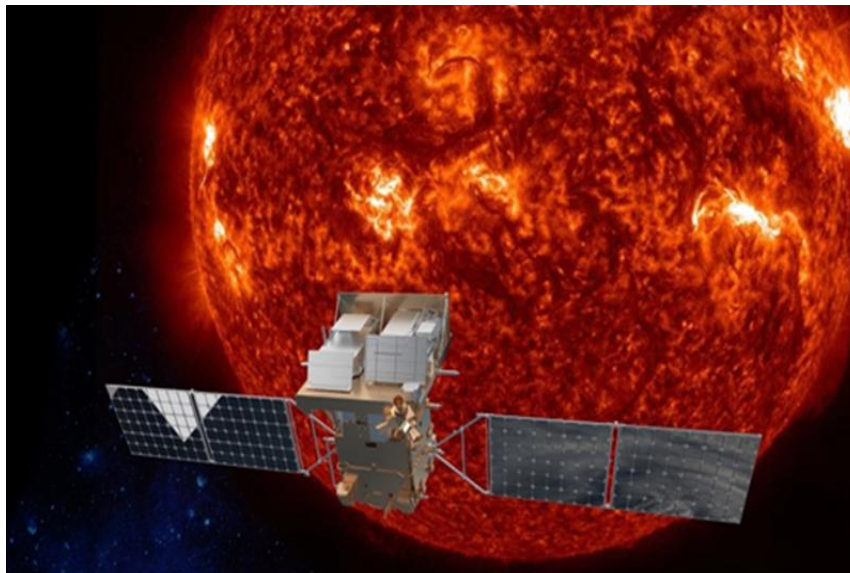
- Dragonfly rotorcraft is scheduled to be launched in 2027 and reach the Selk Crater region on Titan in the year 2034.
- The spacecraft, weighing less than 1,000 pounds, will look similar to a military transport helicopter.
- It will operate like a drone to understand the composition of Titan and conduct research to understand the origin of life on Earth.
- This would be the first aircraft on the Saturn's moon and the first-ever fully controlled atmospheric flight on any moon.
- It will be the first flying machine targeting a celestial body in the outer solar system.
- Titan is the target of NASA's Dragonfly rotorcraft since it is an ideal destination to research prebiological chemistry, astrobiology and the potential habitability of an extra-terrestrial world.
- Using all the radar images from Cassini spacecraft for over 13 years, scientists have successfully characterized Selk Crater region – the future destination of the Dragonfly rotorcraft.
- Researchers used angled shadows and radar reflectivity to accurately determine the surface's properties. They were able to map 6 terrains in the site, which helped them measure the rim height of the Selk Crater.



- This will enable the smooth landing of the NASA rotorcraft and help in its accurate exploration of Titan.
- Dragonfly is set to land on an equatorial, dry region of the Saturn's moon, which has frigid and thick atmosphere having hydrocarbon.
- While liquid methane rain frequently occurs in Titan, it is more like a desert seen on the Earth, with the presence of dunes, small mountains and an impact crater.
- Using the data obtained from the Cassini spacecraft, scientists were able to analyse less than 10 per cent of Titan's surface. This means that there is a possibility of the presence of small rivers and landscapes that remain unnoticed.

#### 5.14 Kuafu-1: China's first space-based solar telescope

The Advanced Space-based Solar Observatory (ASO-S) – China's first space-based solar telescope – was launched recently.



#### **Key facts**

- The Advanced Space-based Solar Observatory (ASO-S) was launched aboard the Long March-2D carrier rocket from the Jiuquan Satellite Launch Center in northwestern part of China.
- It is nicknamed Kuafu-1, after a mythical giant that sought to capture and tame the sun.
- The solar mission, which is expected to last for 4 years, will enable scientists to capture and study the previously unprecedented images of the Sun during the “solar maximum” (when sun has the highest number of sun spots). The solar maximum is expected to occur around the year 2025.
- The ASO-S is China's first full-scale satellite dedicated to researching the Sun. It is the world's first solar telescope capable of simultaneously monitoring both solar flares and coronal mass ejections.
- It will study the Sun from an orbit 720 km above the surface of the Earth.
- The mission is capable of simultaneous observation of the entire Sun's vector magnetic field, imaging spectroscopy at high energies of solar flares, and studying the formation and evolution of solar flares and coronal mass ejections on the disk and in the inner corona.

- This will improve the understanding of the physics of solar eruptions and further the forecasting capability of solar weather.
- The solar satellite will send 500 GB data concerning the Sun's magnetic field, solar flares and coronal mass ejections each day to ground stations in Sanya, Kashgar and Beijing.
- During the solar eruptions, the satellite can send pictures to ground stations every second.
- From the ground stations, the data is transferred in packages to a 2,048-core computer in Purple Mountain Observatory.
- This mission is similar to NASA's Parker Solar Probe and ESA's Solar Orbiter.
- India is planning to launch a similar solar mission in 2023 called Aditya-L1 to research the solar atmosphere.

### 5.15 Exercise PowerEX-2022



#### **Key facts**

- Cyber Security Exercise “PowerEX” was designed and organized jointly by Indian Computer Emergency Response Team (CERT-In) and Power-CSIRTs (Computer Security Incident Response Teams in Power sector).
- The CERT-In hosted the cybersecurity exercise on its simulation platform.
- The event witnessed the participation of more than 350 officials from various power sector utilities.
- 193 power sector utilities were invited to take part in this exercise.
- Officials of Exercise Planner Team of Power-CSIRTs collaborated with the CERT-In team as Exercise Coordinators.
- The objective of the recently concluded cybersecurity exercise is to “Recognize, Analyse & Respond to Cyber Incident in IT & OT Systems”.
- Theme of the exercise is “Defending Cyber induced disruption in IT & OT infrastructure”.
- It helped officials working in power sector utilities to learn, practice and respond to the cyber threats.

### Guideline on Cyber Security in Power Sector

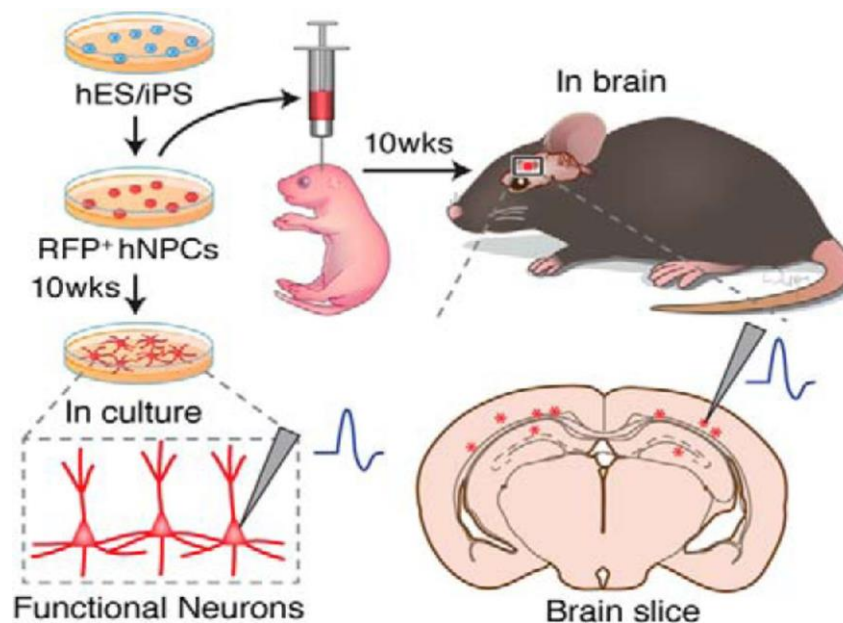
- The Guideline on Cyber Security in Power Sector was released by the Central Government in October 2021. It should be adhered by all Power Sector utilities across India. This is the first comprehensive guidelines focusing on the cybersecurity in power sector. It seeks to improve the preparedness of various power utilities and create a cyber secure ecosystem in the Indian power sector.

### About CERT-In

- The Indian Computer Emergency Response Team (CERT-In) was established in 2004 under Section 70B of the Information Technology Act, 2000. It comes under the aegis of the Union Ministry of Electronics and Information Technology (MeitY). It is a nodal agency that deals with cybersecurity-related threats such as hacking and phishing. It provides security to Indian Internet domain. It is responsible for collecting, analysing and disseminating information related to cyber incidents. It is also involved in forecasting and warning against cyber threats and taking emergency measures to handle cyber security-related incidents.

### 5.16 Human brain cells integrated into new-born rats

Scientists have successfully implanted and integrated human neurons into new-born rats.



### Key facts

- Studying of complex psychiatric disorders like schizophrenia and autism is difficult since animals do not experience them like people and human beings cannot be used for the research.
- Human brain cells made using stem cells in petri dishes do not grow to the size of human neurons and their isolation from human body makes it difficult to study the symptoms of the neurological disorders.
- These limitations are addressed by implanting and integrating a group of human brain cells called organoid into the brains of new-born rats.
- Integration of human brain cells in new-born rats helps research psychiatric disorders and test treatment against them.

- Only young rats are used for the implantation since brain stops developing after a certain age in rats. This limits how the implanted brain cells integrate.
- The researchers found that the organoids can grow relatively large in young rats, covering about one-third of the rat's brain.
- The integration was tested by blowing air across the rats' whiskers, which triggered electrical activity in the human neurons. This means that the human tissue in the brain was able to process the external stimulation of the rat's body.
- The researchers also tested and concluded that the implanted human neuron can send signals back to the rat's body.
- The technique was recently used to study the Timothy Syndrome. The researchers found that organoids made using brain cells of patients with Timothy Syndrome grew more slowly and displayed less electrical activity than those from healthy people.
- This study will play a major role in improving the current understanding about human brain development and neurodevelopment disorders.
- However, implanted neurons did not replicate the key features of the developing human brain.
- The implantation of human neurons in rats does not make them more human-like because of the limitations on how deeply these neurons integrate with the rat brain.
- However, these barriers may not exist in species closely related to humans like primates and thus causes ethical concerns over progressing further into the experiment.

### 5.17 Allmania multiflora

A new species of plant named *Allmania multiflora* was discovered on the granite hillocks of Palakkad.



#### Key facts

- Allmania multiflora is a new species belonging to the genus Allmania.
- It is only the second species of the Allmania genus found in the world.
- The new species was discovered 188 years after the genus and the first species Allmania nodiflora were described.



- The discovery of the new species was made during the ongoing study of Amaranthaceae – a plant family to which the genus Allmania belongs to.
- Before the new species was identified, Allmania nodiflora was believed to be the only lone species of the genus Allmania.
- Allmania nodiflora was published under the genus Celosia as Celosia nodiflora in 1753. It was later described as Allmania nodiflora in 1834. Its native range span from the Indian subcontinent to China and western and central Malesia.
- Allmania multiflora is an annual herb having unique molecular and morphometric characteristics and its discovery is significant from botanical and conservation perspectives.
- It is found to reach a maximum height of around 60 cm at an altitude between 1,000 to 1,250 meters.
- The herb is erect with branches arising from the base. While the top of the stem is green, the hue of the base range from red to violet.
- The species has shorter tepals and gynoeceum and shorter bracts. Flowering and fruiting of the herb occur from May to September.
- It was christened Allmania multiflora because of the presence of a higher number of florets within an inflorescence.
- It is currently found only in a few locations in small numbers. Hence, it was assessed to be a critically endangered species.
- The species is threatened as it is being exploited by local people as a vegetable along with amaranths.
- Its native habitats of granite hillocks, which are situated close to human settlements, are threatened because of fire, grazing, quarrying, pollution, etc.

### **5.18 India to expand NaVIC**

India is planning to expand the regional satellite navigation system NavIC.



#### **Key facts**

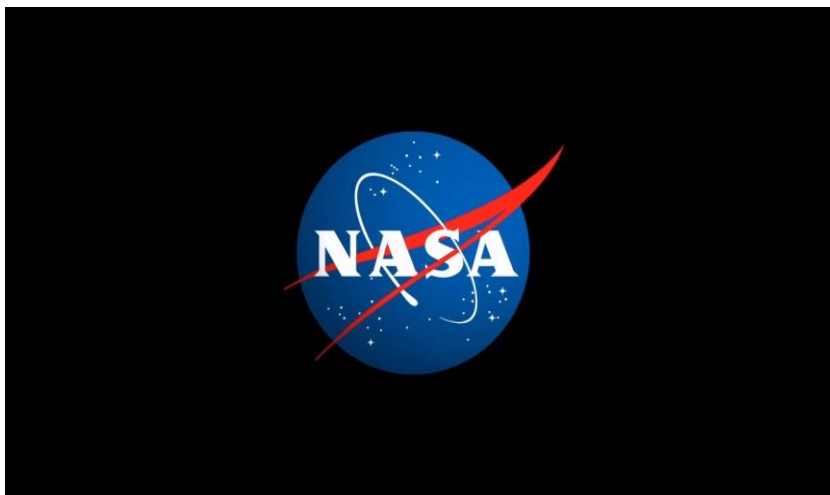
- The Indian Space Research Organization (ISRO) is currently planning to expand the Navigation with Indian Constellation (NavIC).

- It had sought the government's permission to launch 12 additional satellites into the Medium Earth Orbit (MEO) for this purpose. Placing NavIC satellites in MEO will make them global like GPS.
- Currently, NavIC satellites are either in geostationary or geosynchronous (GEO) orbit (36,000 km from Earth). The MEO orbits occupy space between GEO and Low Earth Orbit (250-2,000 km from Earth).
- Several of the satellites in the current NavIC constellation are not operational.
- ISRO is planning to replace at least five of these existing satellites with L-1, L-5, and S-Band, which will provide improved global positioning services.
- The NavIC satellites are currently operating in L-5 Band and S Band, which are used only for transportation and aviation sectors.
- The inclusion of the L-1 band in the new satellite would help NavIC become easily accessible to civilians
- The new satellites will have improved features for securing communication. Currently, NavIC only provides short code. The improved version will provide long code so that communications are not breached while being used for strategic and security purposes.

#### **About NavIC**

- NavIC is an independent stand-alone navigation satellite system developed by ISRO. It was operationalized in 2018 with 7 satellites covering the whole of the Indian landmass and up to 1,500 km from the international boundaries. It is currently being used for public vehicle tracking, providing emergency warning alerts for fishermen sailing to the deep sea, and tracking information related to natural disasters. With NavIC, India is one of the few countries having its own positioning system. Others with their own navigation satellite systems are Russia (GLONASS), the European Union (Galileo), and China (BeiDou Navigation Satellite System).

#### **5.19 NASA to study Unidentified Aerial Phenomena**



NASA recently launched an independent study of unidentified aerial phenomena.

- A new team of scientists and experts are set to study unidentified aerial phenomena (UAP), formerly known as UFOs.

- Its aim is to lay groundwork for the future research on the nature of UAPs for NASA and other agencies.
- The team consists of former astronauts Scott Kelly and 15 other members having backgrounds in fields like computational data science, physics, astrophysics, astronomy, oceanography and others.
- It would be led by astrophysicist David Spergel, who is the president of Simons Foundation and the former chairman of the Princeton University's astrophysics department.
- The team is expected to submit the finished report in mid-2023.
- The research will focus only on unclassified data. It will identify how the data collected by civilian government entities, commercial entities and other sources can be used for understanding UAPs.
- It will then provide strategy for potential UAP data analysis, which in turn will help in the systematic collection of data and investigation of UAPs.
- This study is separate from the work of the Defence Department group that is currently investigating UAP incidents.

### **What is unidentified aerial phenomena (UAP)?**

- The unidentified aerial phenomena (UAP) is any aerial phenomenon that cannot be immediately identified or explained. According to the senior defence and intelligence officials who testified in the US Congress in May 2022, there have been 400 sightings of UAPs till date and many of them are not identified as advanced earthly technologies, atmospheric or something alien. One of these airborne object exhibited speed and manoeuvrability that surpassed the capabilities of known aviation technology. It also did not have any visible means of propulsion or flight control surfaces. A report released by the Office of the Director of National Intelligence (ODNI) and the Pentagon's UAP Task Force in 2021 concluded that there is no evidence to suggest that these objects originated from foreign adversary or were extraterrestrial in nature.

### **What are “viral spillover risks”?**

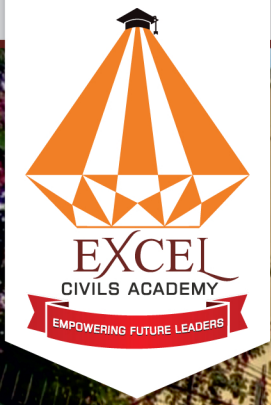
- A new research found that climate change could increase the risk of “viral spillover” in several parts of the world. This could cause pandemics in the future.

### **Key facts**

- A new research article titled “Viral spillover risk increases with climate change in High Arctic lake sediments” was released recently.
- Viral spillover occurs when viruses overcome several barriers to infect new host from reservoir host (in which it usually resides).
- The researchers from the University of Ottawa sought to study the possibility of a viral spillover by collecting sediments and soil samples from Lake Hazen in Canada – the world's largest High Arctic lake by volume.
- High Arctic was chosen for this study since it is warming faster than the rest of the world.



- The researchers sequenced the RNA and DNA to reconstruct the lake area's virus composition and estimated the viral spillover risks.
- The study found that the chances of viruses successfully infecting new host increases with the runoff from glacier melt.
- With global warming increasing the instances of glacier melting, there is a high possibility of previously ice-trapped viruses and bacteria finding new hosts and increasing spillover risks.
- Spillover risks are also increased due to changes in global distribution and dynamics of the viruses, their reservoirs and vectors.
- However, this does not guarantee a higher possibility of pandemic occurring in the future.
- This is because viral spillover depends on three main categories – pathogen pressure, human and vector behaviors and attributes of the host.
- All these phases are fraught with several natural challenges that the virus must overcome to successfully reach the new host.
- Coronaviruses successfully overcame these barriers since they are RNA viruses capable of evolving more quickly than other virus families because of their ability to recombine and acquire point mutations.
- Other pathogens that have successfully spilled over to humans are Influenza A and Ebola.



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