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## JANUARY 2024



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- Revised criminal reform Bills
- Telecom Bill 2023
- Press and Registration of Periodicals Bill
- Latest blip in India-Maldives ties
- Skill Development in Rural Areas
- Loss and damage fund approved at COP 28
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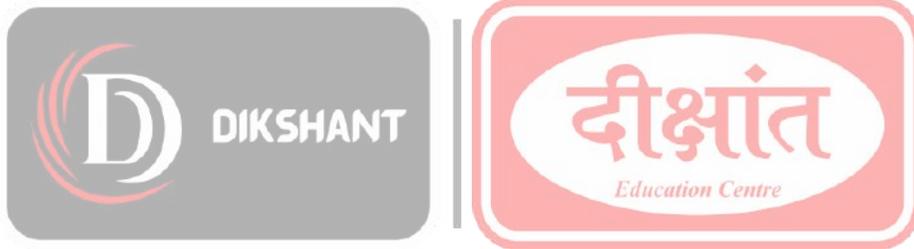
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## POLITY & GOVERNANCE

### IS ANOTHER PROHIBITION SURVEY NEEDED IN BIHAR?



#### Why in news?

- Recently, at a function to mark Nashamukti Diwas or 'de-addiction day', Chief Minister announced that there would be a fresh "house-to-house" survey to assess the impact of liquor prohibition in Bihar. The survey is likely to begin from mid-December.

#### When did the State ban liquor?

- To curb alcoholism, the Bihar government amended the Bihar Excise Act, 1915 and promulgated the Bihar Prohibition and Excise (Amendment) Act, 2016 from April 5, 2016, introducing total prohibition in the State.
- On October 2, 2016 it promised to "enforce, implement and promote complete prohibition of liquor and intoxicants in the territory of the State of Bihar and for matters connected therewith or incidental thereto". However, since then, the Act has been amended several times.

#### Has the ban served its purpose?

- Despite complete prohibition, illegal liquor bottles are known to have been funnelled into the State through States such as Uttar Pradesh, Jharkhand and West Bengal and sometimes, even after crossing the porous border of the neighbouring country of Nepal.
- Innovative ways are used including ambulances, hearses, gas cylinders, under vegetable sacks in pick-up vans and trucks and in pantry car coaches of trains. In courts, there is a huge pile-up of prohibition-related cases across the State.
- In December 2021, the then Chief Justice of the Supreme Court, Justice N.V. Ramana, expressed

concern over the (prohibition) law saying it was enforced with "lack of foresight" which has led to the "clogging of courts in the State".

#### How many households will the survey cover?

- A form, in Hindi and English, will be circulated, seeking feedback from the people on whether they support the liquor ban, their family's economic condition, social strata, and whether their quality of life has improved because of prohibition.
- The survey will cover a minimum of 2,500 households in all 38 districts and will be completed in 12 weeks.
- The data of the survey will be collected on a day-to-day basis digitally.

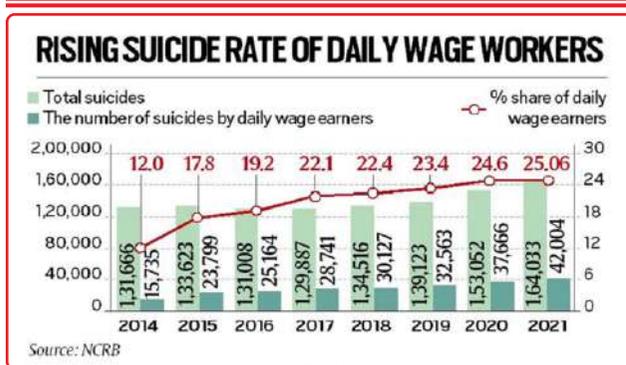
#### Have there been surveys on the ban earlier?

- There have been two surveys on the impact of the liquor ban in the State – in August 2018 and February 2023, initiated by the State government.
- The first survey, conducted by Patna-based Asian Development Research Institute (ADRI) said there has been a positive impact after prohibition on people of the State as 1.64 crore have quit drinking, and spent the money saved to buy milk, vegetables and clothes.
- The second survey was conducted by the Chanakya Law University in association with the Bihar Rural Livelihood Project (Jeevika) which had covered 33,000-odd villages in 534 blocks across all 38 districts of the State covering over 10 lakh people.
- The survey had revealed that 1.82 crore have quit drinking but 4.39% admitted that they were still consuming liquor.

#### What is the reason to conduct a fresh survey?

- Despite the fact that the prohibition law has been amended thrice since April 2016, illegal trade in both Indian Made Foreign Liquor (IMFL) and country-made brew has been thriving.
- The government has been conducting regular raids using drones, breath analysers, and setting up more check posts with personnel holding hand-held scanners at inter-State borders.
- As many as 74 special courts (excise) have been made functional and awareness programmes like street plays and posters are regularly put up but there has been no apparent let-up in the illegal supply of liquor.
- The Chief Minister said that based on the findings of the fresh survey, new measures will be introduced.

**ONE-THIRD OF ALL 2022 SUICIDES WERE OF DAILY WAGE EARNERS, FARMERS, SAYS NCRB REPORT**



**Why in news?**

- Recently, the National Crime Record Bureau's (NCRB) Accidental Deaths and Suicides in India (ADSI) 2022 report and the NCRB's annual Crime in India (2022) report, was released.

**Key Highlights:**

- India reported a total of over 1.7 lakh suicides in 2022, nearly one-third of whom were daily wage earners, agricultural labourers, and farmers.
- The latest Crime in India report showed an overall increase in crimes and atrocities committed upon Scheduled Castes (SC) and Scheduled Tribes (ST), with Rajasthan, Madhya Pradesh, Chhattisgarh, and Telangana, all seeing an increase in such cases in 2022 compared with the year before.
- Mizoram, which had reported no cases of atrocities against either SCs or STs in 2021, reported five cases of atrocities against SCs and 29 such cases of crimes against STs in 2022.
- Madhya Pradesh and Rajasthan continued to figure in the top five States with the highest incidents of crimes and atrocities committed upon SCs and STs.
- Other States, where crimes and atrocities against SC/ST people were the highest are Bihar, Uttar Pradesh, Odisha, and Punjab.

**Increase in UAPA cases:**

- The Crime in India report showed that cases of offences against the State had also increased marginally in 2022 compared with the previous year, showing about a 25% increase in cases registered under the Unlawful Activities Prevention Act (UAPA).
- Cases under the sedition section of the Indian Penal Code saw a dramatic dip on the other hand, possibly owing to the Supreme Court's May 2022 decision to keep sedition cases in abeyance.

**Fake currency notes:**

- The government authorities seized fake Indian currency notes (FICN) worth over ₹342 crore in 2022, out of which FICN worth ₹244 crore were copies of

the ₹2,000 currency note, followed by seizures of ₹500 currency notes (this included discontinued currency as well), keeping with the trend of FICN seizures from 2021.

**Suicide data:**

- The suicide data showed that the maximum suicides in the year were reported from Maharashtra (22,746), Tamil Nadu (19,834), Madhya Pradesh (15,386), Karnataka (13,606), Kerala (10,162), and Telangana (9,980).
- Apart from daily wage earners, and agricultural workers and farmers, the ADSI data showed that 9.6% of the suicides in 2022 were of persons who were self-employed or salaried professionals.
- This was followed by unemployed persons, who comprise 9.2% of all suicides reported in India in 2022. Among all suicides reported in the year, over 12,000 were of students.

**Categories:**

- Among the around 48,000 women who died by suicide in 2022, the ADSI report found that over 52% were home-makers, which brings such women to about 14% of the total suicides reported in the year.
- This was followed by women who were students and daily wage earners respectively.
- The survey also showed that 28 trans-persons were also reported to have died by suicide in 2022.

**Causes of suicide:**

- The report pointed out that the most common causes for suicides reported in 2022 were "family problems" and "illness", which together accounted for almost half of all suicides in the year.
- This was followed by "drug abuse", "alcohol addiction", "marriage related issues", etc.
- However, under the cause of "marriage related issues" most number of people were women, specifically citing "dowry related" as one of the causes.

**THOSE ARRESTED FOR ECONOMIC OFFENCES SHOULDN'T BE HANDCUFFED UNDER NEW LAW, SAYS PARLIAMENTARY PANEL**



**Why in news?**

- A parliamentary panel that has recommended that the use of handcuffs by police for arresting a person

accused of 'economic offences' should be deleted from Clause 43 (3) of the proposed law.

- This is because the term "economic offences" encompasses a wide range of offences, ranging from petty to serious, and therefore, it may not be suitable for blanket application of handcuffing in all cases falling under this category.

#### Committee on BNSS:

- The 28-member Standing Committee on Home Affairs headed by BJP leader Brij Lal scrutinised the Bharatiya Nagarik Suraksha Sanhita (BNSS), the law that seeks to replace the Code of Criminal Procedure, 1973.
- The BNSS will replace the CrPC 1973, which regulates the procedure for arrest, investigation, inquiry, and trial of offences under the Indian Penal Code, and under any other law governing criminal offences.

#### Clause 43 (3) of the BNSS:

- Clause 43 (3) of the BNSS states that "the police officer may, keeping in view the nature and gravity of the offence, use handcuff while effecting the arrest of a person who is a habitual, repeat offender who escaped from custody, who has committed offence of organised crime, offence of terrorist act, drug-related crime, or offence of illegal possession of arms and ammunition, murder, rape, acid attack, counterfeiting of coins and currency notes, human trafficking, sexual offences against children, offences against the State, including acts endangering sovereignty, unity and integrity of India or economic offences."
- The parliamentary panel has said in its report that handcuffing, as outlined in Clause 43(3), is appropriately restricted to select heinous crimes, which is necessary for preventing the escape of individuals accused of serious offences and ensuring the safety of police officers and staff during arrests.

#### Clause 23:

- It has noted that in its present form Clause 23 of the BNSS does not empower the Court of a Judicial Magistrate of the first class or the second class to impose community service as a punishment.
- With respect to imposition of community service as a form of punishment, the committee believes that this approach highlights that punitive actions can also encompass societal restitution and personal growth said.
- The Committee also feels that it would be necessary and appropriate to award the power to impose this form of punishment, to the Court of a Judicial Magistrate of the first class or the second class.

#### About BNSS:

- BNSS is one of three laws that the government has mooted as part of its overhaul of India's three major criminal laws – the Indian Penal Code, 1860; The Indian Evidence Act, 1872; and the CrPc.

- While the CrPC has 484 sections, BNSS has 533 clauses. The proposed law has changes in 160 sections from its predecessor, an addition of nine new sections, and the deletion of nine others.
- The BNSS bill proposes community service as one of the punishments for petty offences under Bharatiya Nagarik Suraksha Sanhita, like defamation, public servants unlawfully engaging in trade, non-appearance in response to a proclamation, and attempt to commit suicide to compel or restrain the exercise of lawful power.

### SAANSAD ADARSH GRAM YOJANA AIMS TO CREATE HOLISTICALLY DEVELOPED MODEL GRAM PANCHAYATS



#### Why in news?

- Recently, the Union Minister of State for Rural Development, in a written reply in Lok Sabha discussed the Saansad Adarsh Gram Yojana (SAGY).
- It aims to create holistically developed model Gram Panchayats across the country.

#### Salient features:

- It is a unique scheme of the Ministry of Rural Development wherein, for the first time, the leadership, capacity, commitment and energy of the Members of Parliament are being leveraged directly for development at the Gram Panchayat level.
- The goal of Saansad Adarsh Gram Yojana (SAGY) is to translate the comprehensive and organic vision of Mahatma Gandhi on village development into reality.
- These 'Adarsh Grams' are desired to serve as 'nucleus of health, cleanliness, greenery and cordiality' within the village community and become schools of local development and governance, inspiring neighbouring Gram Panchayats.
- SAGY aims at instilling certain values in the villages and their people so that villages get transformed into models for others.
- These values include ensuring the involvement of all sections of society in all aspects related to the life of the village, especially in decision-making related to governance, adhering to Antyodaya – enabling the "poorest and the weakest person" in the village

to achieve well-being, affirming gender equality, ensuring respect for women, guaranteeing social justice, instilling dignity of labour and the spirit of community service and voluntarism.

- Besides, promoting a culture of cleanliness, living in consonance with nature – ensuring balance between development and ecology, preserving and promoting the local cultural heritage, inculcating mutual cooperation, self-help and self-reliance, fostering peace and harmony in the village community, bringing about transparency, accountability and probity in public life, nurturing local self-governance, adhering to the values enshrined in the Fundamental Rights and Fundamental Duties of the Indian Constitution are also desired.

### Key Objectives of SAGY are:

- To substantially improve the standard of living and quality of life of all sections of the population through improved basic amenities, higher productivity, enhanced human development, better livelihood opportunities, reduced disparities, access to rights and entitlements, wider social mobilization and enriched Social Capital.
- To generate models of local level development and effective local governance, which can motivate and inspire neighbouring Gram Panchayats to learn and adapt.
- To trigger processes, which lead to holistic development of the identified Gram Panchayats.

### Approach:

- Leveraging the leadership, capacity, commitment and energy of the Members of Parliament (MP) to develop model Gram Panchayats.
- Engaging with and mobilizing the community for participatory local level development.
- Converging different government programmes as well as private and voluntary initiatives to achieve comprehensive development in tune with people's aspirations and local potential.
- Building partnerships with voluntary organizations, cooperatives and academic and research institutions.
- Focusing on outcomes and sustainability

### Implementation:

- The Members of Parliament have identified 3,390 Gram Panchayats across the country under SAGY since its inception.
- Under the Saansad Adarsh Gram Yojana framework, the development of Gram Panchayats is envisaged through convergence and implementation of existing Government Schemes and Programmes under the administrative control of respective Ministries without allocating additional funds
- As per the Guidelines, the responsibility of implementing the SAGY largely depends on the functionaries concerned at different levels.

### Functioning:

- As the entire programme is implemented in a convergence model, the District Collector plays a significant role. In the SAGY guidelines, as per component 10 (d) the District Collector is the nodal officer for implementing SAGY.
- The District collector conducts a monthly review meeting with representatives of the participating line departments. The Members of Parliament concerned chair the review meetings. The heads of the GPs concerned are invited for these monthly meetings. The Ministry has provided training on SAGY implementation process to the Gram Panchayat heads.
- The Ministry has prepared a compendium on SAGY containing supporting materials to help various stakeholders in the implementation of SAGY and distributed the same amongst the participants of the said training programmes.

## GOVERNMENT TO IMPLEMENT THE COMPONENT OF "NARI ADALAT" IN A PHASED MANNER



### Why in news?

- Recently, the Minister of Women and Child Development, in a written reply discussed the implementation the component of 'Nari Adalat'.

### 'Mission Shakti':

- The Government of India implements 'Mission Shakti', an integrated women empowerment programme as umbrella scheme for the safety, security and empowerment of women for implementation during the 15th Finance Commission period across the country aimed at strengthening interventions for women safety, security and empowerment.
- It seeks to realise the Government's commitment for 'women-led development' by addressing issues affecting women on a life-cycle continuum basis and making them equal partners in nation-building through convergence and citizen-ownership.
- It also focuses on strategies for improving convergence across Ministries/ Departments and at different levels of governance.

**Sub-schemes:**

- 'Mission Shakti' comprises of two sub-schemes 'Sambal' and 'Samarthya' for safety and security of women and empowerment of women respectively.
- The schemes of One Stop Centres (OSC), Women Helplines (181-WHL), Beti Bachao Beti Padhao (BBBP) and Nari Adalat are part of 'Sambal' sub-scheme; while the components of Pradhan Mantri Matru Vandana Yojana (PMMVY), Palna, Shakti Sadan, Sakhi Niwas and Hub for Empowerment of Women are part of 'Samarthya' sub scheme.

**Budget allocation:**

- The total approved outlay of 'Mission Shakti' for the 15th Finance Commission period is Rs. 20,989 crore, with Central Share of Rs. 15,761 crore and State Share of Rs 5,228 crore.
- The budget allocation under Mission Shakti for the financial year 2023-24 is Rs. 3143.96 crore, out of which for 'Sambal' sub scheme, the budget provision is Rs 562.00 crore and actual expenditure as on 30.11.2023 is Rs. 140.33 crore.
- For 'Samarthya' sub scheme, the budget provision is Rs 2581.96 crore and actual expenditure as on 30.11.2023 is Rs 141.83 crore.

**Nari Adalat:**

- The Government has decided to implement the component of "Nari Adalat" in a phased manner under Mission Shakti. In the first phase, the State of Assam and the Union Territory (UT) of Jammu & Kashmir (J&K) have been selected by the Ministry to implement the component of Nari Adalat.
- In UT of J&K it is being implemented in two aspirational districts i.e. Kupwara and Baramulla selected by the UT.
- In the State of Assam it is being implemented in 7 blocks in 7 districts namely Barpeta, Goalpara, South SalmaraMankachar, Udalguri, Darrang, Morigaon, Kamrup.
- As per the cost norms prescribed under Mission Shakti guidelines and proposals received from both the State/ UT, 100% funds amounting to Rs. 21.60 lakh and Rs. 20.80 lakh have been released to Jammu & Kashmir and Assam respectively for implementation of Nari Adalat during FY 2023-24.

## PARLIAMENT PASSED THE ADVOCATES AMENDMENT BILL

**Why in news?**

- Recently, the Advocates Amendment Bill, 2023, was passed in the Lok Sabha. Introduced in the Rajya Sabha's Monsoon Session on August 1, the Bill was passed by the House.
- Aimed at weeding out 'touts' from the legal system, the Bill repeals the Legal Practitioners Act, 1879, and amends the Advocates Act, 1961, to reduce "the

number of superfluous enactments in the statute book" and repeal all "obsolete laws".

**What does the now-repealed 1879 Act state?**

- The Legal Practitioners Act came into force in 1880, "to consolidate and amend the law relating to Legal Practitioners in certain provinces."
- The Act initially extended to areas in West Bengal, Uttar Pradesh, Punjab, Bihar, Madhya Pradesh, Assam, Orissa, and Delhi. Any state government could, by notification in the Official Gazette, extend it to their states.
- Section 2 of the 1879 Act defined the term "legal practitioner" to include advocates, vakils, or attorneys of any High Court. It also introduced a new definition of the term "tout".
- A "Tout" was defined as someone who procures, in consideration of any remuneration from any legal practitioner, the employment of a legal practitioner in any legal business; or one who proposes to any legal practitioner or anyone interested in any legal business to procure, for remuneration, the employment of the legal practitioner in such business.
- A tout is someone who procures clients for a legal practitioner in exchange for payment. The definition also included people who frequented civil or criminal courts, revenue offices, railway stations, etc. for such procurement purposes
- The Advocates Act of 1961 was passed in independent India to create a single Act to regulate the legal profession. This Act repealed a majority of the 1879 Act but left behind provisions relating to its extent, definitions, and powers to frame and publish lists of touts.

**What is the Advocates Act of 1961?**

- The Advocates Act, 1961, was enacted to amend and consolidate the law relating to legal practitioners and to provide for the constitution of Bar Councils and an All-India Bar.
- Before this, legal practitioners were governed by three Acts; the Legal Practitioners Act, 1879, the Bombay Pleaders Act, 1920, and the Indian Bar Councils Act, 1926.
- Post-independence, a need was felt for bringing in changes in India's judicial administration. The Law

Commission was tasked with preparing a report on reforms.

- In its 249th Report titled 'Obsolete Laws: Warranting Immediate Repeal', the Commission recommended repealing the 1879 Act.
- The All-India Bar Committee made its recommendations on the subject in 1953. Taking these into account, the 1961 Act was passed.

**What does the Advocates Amendment Bill, 2023, say?**

- The new Bill now amends the 1961 Act by inserting a new provision right after Section 45, which prescribes six months of imprisonment for persons illegally practising in courts and before other authorities.
- The new provision, Section 45A, states that the Bill enables every HC and district judge to frame and publish lists of touts. However, no person's name will be included in any such list until they have had an opportunity to show cause against such inclusion.
- Further, any authority empowered to make lists of alleged or suspected touts can send them to any subordinate court, which, after holding an inquiry into the conduct of such persons, will allow them an opportunity to show cause. After this, the lower court will report back to the authority ordering the inquiry.
- If proven to be a tout, the person's name will be included in the list of touts that will be published by the authority and hung in every court. The court or judge may exclude any person whose name is included in any such list from the court's vicinity.
- Additionally, this provision punishes anyone acting as a tout "while his name is included in any such list" with imprisonment up to three months, a fine that may extend to five hundred rupees, or both.
- Section 45A of the new Bill is analogous to Section 36 of the 1879 Act. However, the 1961 Act did not include the provision. This is exactly what the new Bill sought to remedy.

of the two Presidential Orders CO (The Constitution (Application To Jammu and Kashmir) Order) 272 and 273 of August 5 and 6, 2019 respectively by which the entire Constitution of India was made applicable to J&K, and all provisions of Article 370 were declared inoperative.

- It confirmed that the President could "unilaterally issue a notification that Article 370 ceases to exist".

**Key issues in the challenge to the decisions of the government:**

- On the sovereignty of Jammu and Kashmir:
- The petitioners had argued that J&K retained an element of sovereignty when it joined the Indian Union in 1947. This arrangement, they argued, was distinct from the relationship with the other princely states that merged with India.
- The court examined the constitutional set-up of the erstwhile state to examine if it retained an element of sovereignty, which would allow Article 370 to operate in "unique circumstances".
- First, Article 1 of the Constitution of India provides that India is a Union of States. Article 1 references "Part III states", and Jammu and Kashmir was listed as a Part III state (before 2019) in the First Schedule to the Constitution of India.
- Second, Section 3 of the Constitution of Jammu and Kashmir declared that Jammu and Kashmir is an integral part of India.
- The provision read: "Relationship of the State with the Union of India: The State of Jammu and Kashmir is and shall be an integral part of the Union of India." Section 147 of the J&K Constitution prohibited any amendment to Section 3.
- The court held that these provisions contradict the argument that an agreement of merger was necessary for Jammu and Kashmir to surrender its sovereignty. It noted that when Yuvraj Karan Singh issued the Proclamation adopting the Indian Constitution on November 25, 1949, it effectively had the effect of a "merger" like any other princely state.

**SC UPHOLDS REPEAL OF J&K SPECIAL STATUS**



**Why in news?**

- A Constitution Bench led by Chief Justice of India (CJI) D Y Chandrachud upheld the constitutional validity

**Courts verdict:**

- The declaration that the Constitution of India would not only supersede all other constitutional provisions in the State which were inconsistent with it but also abrogate them achieves what would have been attained by an agreement of merger," the CJI said in his opinion, written also for Justices B R Gavai and Surya Kant.
- However, Justice S K Kaul in his concurring opinion held that J&K retained an element of internal sovereignty despite Maharaja Hari Singh signing the Instrument of Accession (IoA) with India.
- He cited the recognition of this internal sovereignty in Article 370 when it recognised the Constituent Assembly of the State. However, this had no bearing on the final conclusions reached by Justice Kaul.

**On whether Art 370 is temporary or permanent:**

- A range of arguments were made before the Court on the permanence (or lack thereof) of Article 370. The petitioners argued that the provision could not be abrogated since it had attained permanence, and as the original part of the Constitution forms the basic structure, which cannot be tinkered with.
- It was argued that since 370(3) prescribes the recommendation of the Constituent Assembly of the State (which has ceased to exist) as a prerequisite to abrogate Article 370, its abrogation is essentially infructuous. This means no constitutional means existed to abrogate Article 370 once the J&K Constituent Assembly had ceased to exist.

**Courts verdict:**

- The opinions of both the CJI and Justice Kaul held that Article 370 was always meant to be a "temporary" feature.
- Justice Kaul held that since Article 370 is meant to be a temporary arrangement, it cannot be said that the mechanism under Article 370(3) came to an end after the State Constituent Assembly was dissolved.
- The CJI said that there were two aspects that showed the temporary nature of Article 370. First, it was intended as an interim arrangement until the Constituent Assembly of the State was formed since in the interim, there was needed a legal bridge between J&K and India.
- Once the J & K Constitution was enacted and it was adopted to be a part of India, this arrangement would not have been necessary.
- Second, the provision was adopted because of the special circumstances in the state, which was experiencing war conditions.

**On the legality of the abrogation of Article 370:**

- The legal route for the abrogation of Article 370 was twofold.
- First, on August 5, 2019, then President Ram Nath Kovind issued CO 272, which amended Article 367 of the Constitution. Article 367 deals with interpretation of the Constitution, and the CO added a new meaning to "Constituent Assembly of Jammu and Kashmir" to mean "legislative assembly of Jammu and Kashmir."
- Then, CO 273 was promulgated seeking the consent of Parliament (which had assumed powers of the J&K legislature) to recommend that "all clauses of the said article 370 shall cease to be operative".

**Courts verdict:**

- While Justice Kaul upheld this process, CJI Chandrachud in his opinion said that the circuitous route of first changing the meaning of the Constituent Assembly of J&K was not needed.
- Essentially, after the Constituent Assembly of the state ceased to exist, the President could have always unilaterally abrogated Article 370.

- The power under Article 370 (3) did not cease to exist upon the dissolution of the Constituent Assembly of Jammu and Kashmir.
- When the Constituent Assembly was dissolved, only the transitional power recognised in the proviso to Article 370 (3) which empowered the Constituent Assembly to make its recommendations ceased to exist. It did not affect the power held by the President under Article 370(3).

**On the action that was taken under President's rule:**

- The petitioners had argued that the Union took "irrevocable" action without the state's consent when it was under President's rule. Here, the challenge was to the extent of powers that can be appropriated when Article 356 is in operation.
- Both the CJI and Justice Kaul cited the 1994 ruling in S R Bommai v Union of India that defined the contours of proclamation of President's rule. The Bommai ruling was a nine-judge Bench verdict that is binding on a smaller 5-judge Bench.
- Relying on the Bommai ruling, the court said that the standard to decide the validity of the President's action was to see whether it was not "mala fide or palpably irrational", or that the "advisability and necessity of the action was not borne in mind by the President".
- The court also held that the petitioner and the Union government must show mala fides to the court. The ruling rejected the argument that irrevocable action being taken cannot be accepted as proof of mala fides.

### REVISED CRIMINAL REFORM BILLS IN PARLIAMENT

**Why in news?**

- The Centre introduced three revised criminal reform Bills in Lok Sabha recently, withdrawing the previous versions, introduced in August 2023.

**Background:**

- The Union Home Minister Amit Shah had introduced three Bills in Lok Sabha to replace the Indian Penal Code (IPC), 1860; the Code of Criminal Procedure, 1973 (originally enacted in 1898); and the Indian Evidence Act, 1872.

- The new bills—Bharatiya Nyaya Sanhita (BNS), 2023, to replace the IPC; Bharatiya Nagarik Suraksha Sanhita (BNSS), 2023, for CrPC; and Bharatiya Sakshya (BS) Bill, 2023, for the Indian Evidence Act—were subsequently referred to a standing committee the same day.
- The committee, headed by BJP MP Brij Lal, proposed several key changes to the Bills. Subsequently, the Centre re-introduced the revamped criminal law Bills in Parliament's winter session. However, several recommendations have gone unconsidered in the new Bill.

### What were the committee's suggestions, and what has changed now?

#### Handcuffs

- The use of handcuffs, as allowed in Clause 43(3) of the BNSS, to prevent the escape of individuals accused of serious offences and ensure the safety of police officers and staff during arrests, was welcomed by the Parliamentary Standing Committee on Home Affairs.
- However, the panel suggested that this should be restricted to select heinous crimes like rape and murder rather than be extended to persons committing "economic offenses."
- This is because the term "economic offences" encompasses a wide range of offences, from petty to serious, and therefore, it may not be suitable for blanket application of handcuffing in all cases falling under this category.
- Additionally, Clause 43(3) of the erstwhile BNSS permitted the use of handcuffs while arresting habitual offenders who escaped from custody or those committing specific offences like human trafficking and counterfeiting, among others.

#### Changes introduced:

- The parliamentary panel's recommendation to delete "economic offences" from this provision has been incorporated in the new Bill.
- Although the earlier BNSS had an extra line on offences against the state to include those that endanger the country's sovereignty, integrity, and unity, the new provision simply mandates using handcuffs for committing an "offence against the state."
- This could mean that the use of handcuffs for arresting people committing such offences has been made more discretionary.
- In addition, the new provision extends the use of handcuffs to persons being produced before a court as well.

#### Mercy Petitions:

- Clause 473(1) of the erstwhile BNSS allowed convicts undergoing death sentences or their legal heirs or relatives to file mercy petitions while providing the procedure and time frame for the same.

- After being informed by jail authorities about the disposal of the petition of a convict sentenced to death, he, his legal heir, or a relative can submit a mercy petition within 30 days to the Governor. If rejected, the person can petition the President within 60 days. No appeal against the order of the President shall lie in any court.
- The earlier provision also said that prior to submitting the plea before the Governor or the President, it may be presented to the Centre or the state government's Home Department.
- However, the panel suggested constituting a quasi-judicial board to deal with commutation and remission matters rather than leaving such judicial functions to the Executive's discretion. It also proposed that a time frame be provided within which mercy petitions would be heard.

#### Changes introduced:

- Besides changing the provision's numbering from clause 473 to 472, the new Bill has deleted the provision that allowed mercy petitions to be forwarded to the Home Department of the state government or the Centre for review.
- Although Clause 473(7) said, "No appeal shall lie in any Court against the order of the President made under article 72," the modified Clause 472(7) makes the Governor's orders under Article 161 unappealable, thereby broadening the scope of what cannot be challenged.

#### Preventive detention powers:

- Clause 172(2) of the BNSS expanded the police's powers while taking preventive action. It allowed police officers to detain or remove persons resisting, refusing, ignoring, or disregarding to conform to any direction given by them under sub-section (1) and take them before a Judicial Magistrate or, in petty cases, release them "when the occasion is past."
- However, the panel suggested that the time period for such detention should be specified, and the words "release him when the occasion is past" need to be clarified to remove ambiguity.

#### Changes introduced:

- The new Bill adds a time limit to this provision. It says the person detained may be taken to a magistrate or, in petty cases, be released as soon as possible, within 24 hours. Moreover, "judicial magistrate" in the old BNSS has been replaced by "Magistrate" now.

#### Community Service:

- The erstwhile BNSS had included "community service" as a penal measure for offences like attempting suicide, restraining exercise of lawful power theft, defamation of public functionaries, and appearing in public places while intoxicated and causing annoyance. However, it was silent on the definition of "community service."

**Changes introduced:**

- The explanation to Clause 23 of the new BNSS defines “community service” to mean work which the Court may order a convict to perform as a form of punishment that benefits the community, for which he shall not be entitled to any remuneration.
- The Bill also adds community service as punishment for unlawfully engaging public servants in trade and non-appearance in response to a proclamation under Section 84.

**TELECOM BILL 2023****Why in news?**

- Recently, the Telecommunications Bill, 2023 was introduced in the Lok Sabha by Union minister for Communications, Electronics & Information Technology Ashwini Vaishnaw.

**What is the Telecommunications Bill, 2023?**

- The Telecommunications Bill, 2023 amends and consolidates the laws relating to “development, expansion and operation of telecommunication services and telecommunication networks; assignment of spectrum; and for matters connected therewith”.
- The new Bill seeks to replace the Indian Telegraph Act, 1885, the Indian Wireless Telegraphy Act, 1933, and the Telegraph Wires (Unlawful Possession) Act, 1950.
- The nature of telecommunication, its usage and underlying technologies have undergone massive changes, especially in the past decade. Therefore, there is a need for enacting a legislation for telecom sector that serves the needs of our society.

**Key Highlights:****Authorisation for telecom-related activities:**

- Prior authorisation from the central government will be required to: (i) provide telecommunication services, (ii) establish, operate, maintain, or expand telecommunications networks, or (iii) possess radio equipment.
- Existing licences will continue to be valid for the period of their grant, or for five years, where the period is not specified.

**Assignment of spectrum:**

- Spectrum will be assigned by auction, except for specified uses, where it will be allocated on an administrative basis.
- These include purposes such as: (i) national security and defence, (ii) disaster management, (iii) weather forecasting, (iv) transport, (v) satellite services such as DTH and satellite telephony, and (vi) BSNL, MTNL, and public broadcasting services.
- The central government may re-purpose or re-assign any frequency range. The central government may permit sharing, trading, leasing, and surrender of spectrum.

**Powers of interception and search:**

- Messages or a class of messages between two or more persons may be intercepted, monitored, or blocked on certain grounds.
- Such actions must be necessary or expedient in the interest of public safety or public emergency, and must be in the interest of specified grounds which include: (i) security of the state, (ii) prevention of incitement of offences, or (iii) public order. Telecom services may be suspended on similar grounds.
- The government may take temporary possession of any telecom infrastructure, network, or services on occurrence of any public emergency or public safety.
- An officer authorised by the government may search premises or vehicles for possession of unauthorised telecom network or equipment.

**Offences and penalties:**

- The Bill specifies various criminal and civil offences. Providing telecom services without authorisation, or gaining unauthorised access to a telecom network or data, are punishable with imprisonment up to three years, a fine up to two crore rupees, or both.
- Breaching terms and conditions of authorisation is punishable with a civil penalty up to five crore rupees.
- Possessing unauthorised equipment, or using unauthorised network or service, is punishable with a penalty of up to ten lakh rupees.

**Other provisions:**

- Appointments to TRAI: The Bill amends the TRAI Act to also allow individuals with: (i) at least 30 years of professional experience to serve as the chairperson, and (ii) at least 25 years of professional experience to serve as members.
- Digital Bharat Nidhi: The Universal Service Obligation Fund has been established under the 1885 Act to provide for telecom services in underserved areas. The Bill retains this provision, renames the fund as Digital Bharat Nidhi, and also allows its use for research and development.
- Adjudication process: The central government will appoint an adjudicating officer to conduct inquiries and pass orders against civil offences under the Bill. The officer must be of the rank of joint secretary and above.

**PARLIAMENT PASSES BILL TO RAISE CAP ON AGE OF GSTAT PRESIDENT, MEMBERS**



**Why in news?**

- Parliament recently passed a bill to raise the age cap of president and members of the GST Appellate Tribunals.
- Rajya Sabha returned the Central Goods and Services Tax (Second Amendment) Bill, 2023 to Lok Sabha without any changes, thus completing the Parliamentary procedure for the bill.

**Key Highlights:**

- The bill, approved by Parliament, seeks to raise the cap on age for president and members of the GST Appellate Tribunals (GSTAT) to 70 years and 67 years, respectively.
- Currently, the age limit for the president is 67 years and for members is 65 years.
- The bill also aims to align the provisions of the Central GST Act in line with the Tribunal Reforms Act, 2021.
- Among others, with the latest changes, an advocate with 10 years of 'substantial experience' in litigation in matters relating to indirect taxes in an appellate tribunal, would be eligible to be appointed as a judicial member of the GSTAT.

**Benches:**

- GSTAT will have one principal bench based in New Delhi, with a President and one judicial and technical member each.
- The state benches of GSTAT will have a president and two judicial members and two technical members (one each from Centre and states).
- Setting up of state-level benches of GSTAT would help businesses by way of faster dispute resolution.

**The Provisional Collection of Taxes Bill 2023:**

- The Provisional Collection of Taxes Bill 2023, which was passed by the Lok Sabha, will give immediate effect to the changes in customs and excise duties announced in the Budget.
- The Bill seeks to obtain the authority from Parliament to provisionally levy and collect the newly imposed or increased duties of customs and excise for 75 days.
- While the changes in rates of income and corporate taxes, incorporated in the Budget announced on

February 1, are effective from April 1 or a notified date, most of the changes in customs and excise duty rates become effective from midnight.

- This Bill proposes to replace the erstwhile Provisional Collection of Taxes Act, 1931 with a minor change that is technical in nature.

**RESTRICTIONS IMPOSED ON SUSPENDED MPS**



**Why in news?**

- Recently, the Lok Sabha and Rajya Sabha collectively suspended 141 MPs, 95 from the Lok Sabha and 46 from the Rajya Sabha till at least the remainder of the ongoing Winter Session, deepening the crisis in the Parliament where some crucial bills were tabled, briefly discussed, and passed.
- The bone of contention remained the Opposition's demand that Union Home Minister Amit Shah speak in the Parliament and that a discussion be held on the December 13 security breach, in which two individuals broke into the Lok Sabha and set off smoke canisters on the floor of the House.

**List of restrictions:**

- The Lok Sabha Secretariat has issued a circular detailing strict measures against 49 recently suspended Opposition MPs.
- These restrictions encompass various aspects of Parliamentary functioning, significantly affecting the MPs' roles and responsibilities.
- The suspended members are now barred from entering the Parliament chamber, its lobby and galleries. This restriction extends to their participation in sittings of Parliamentary Committees, where they hold membership. Any business listed under their names or notices tabled by them will not be considered during the suspension period either.
- No notice tabled by them is acceptable during the period of their suspension. They cannot vote at elections to committees held during the period of their suspension.
- The circular specifies that the MPs will not receive their daily allowance for the duration of the suspension. This decision is in accordance with the Salary, Allowances and Pensions of Members of Parliament Act, 1954.

⇒ It implies that their stay at the place of duty cannot be considered a residence on duty under the said Act.

### What is the process of suspension of MPs?

- ⇒ As a general principle, it is the role and duty of the Presiding Officer; Speaker of Lok Sabha and Chairman of Rajya Sabha to maintain order so that the Parliament House can carry out its duties smoothly.
- ⇒ To ensure this, the House presiding officers are empowered to force a member to withdraw from the House.

### What happens to a suspended MP?

- ⇒ The Member of Parliament, who stands suspended by the order of the leader of the House, is barred from entering the Rajya Sabha or Lok Sabha chambers. Furthermore, they cannot attend the meetings of committees.
- ⇒ Additionally, suspended MPs are not eligible to give notice for discussion or submission, and they also lose the right to get a reply to their questions, if any.
- ⇒ The period of suspension in either house cannot exceed the remainder of the ongoing session.

### Is there any method of recourse available to them?

- ⇒ The suspension can be terminated by a motion in the Parliament House.
- ⇒ However, suspended MPs cannot demand a court intervention, as under Article 122 of the Indian Constitution, parliamentary proceedings cannot be questioned before a court.

## LOK SABHA PASSES PRESS AND REGISTRATION OF PERIODICALS BILL



### Why in news?

- ⇒ Recently, the Lok Sabha passed the Press and Registration of Periodicals Bill, 2023, repealing the colonial era law of the Press and Registration of Books Act, 1867.
- ⇒ The Bill has already been passed by Rajya Sabha in the Monsoon Session.

### Salient features:

#### Grant of title allotment and Certificate of Registration Periodicals

- ⇒ The Bill provides for a simple online mechanism to apply for title verification and grant of certificate

of registration by the Press Registrar General to a periodical as a simultaneous process.

- ⇒ There is no requirement of furnishing any declaration before the local authority or its authentication by the local authority.
- ⇒ A person who has been convicted by any court for an offence involving terrorist act or unlawful activity, or having done anything against the security of the State shall not be permitted to bring out a periodical.
- ⇒ Facsimile edition of a foreign periodical can be printed in India with prior approval of the Central Government and its registration with the Press Registrar General.

### Printing Presses:

- ⇒ A printer of a periodical to furnish an online intimation to the Press Registrar General and the local authority.
- ⇒ No requirement by the Printer to file any declaration before the local authority or obtain authentication from the authority.

### Role of District magistrate/local authority

- ⇒ The Bill envisages minimalistic role of the District Magistrate/local authority with regard to grant of Certificate of Registration and title allotment.
- ⇒ On receipt of an application, the District Magistrate is expected to provide its comments/NOC to the Press Registrar General within 60 days; thereafter the Press Registrar General can proceed to take a decision for grant of registration even where the comments/NOC are not received from the DM/local authority after 60 days.
- ⇒ No requirement for a publisher to file any declaration before the District Magistrate.

### Difference between the Press and Registration of Books Act 1867 and the Press and Registration of Periodicals Bill 2023

- ⇒ Books which were part of the PRB Act 1867 have been taken away from the purview of the PRP Bill 2023, as books as a subject are administered by the Ministry of HRD.
- ⇒ Printing presses do not have to file any declaration before the District Magistrate; only an online intimation has to be filed before the Press Registrar General and the District Magistrate.
- ⇒ No declaration has to be filed by the publisher of the periodical before the District authority; application for title allotment and grant of Certificate of Registration would be made simultaneously to the Press Registrar General and the district authority and decision would be taken by the Press Registrar General.
- ⇒ Statute has been substantially decriminalized as against the PRB Act 1867 which had severe penalties leading to conviction and imprisonment up to 6 months for various violations of the Act.
- ⇒ In the 2023 Bill, punishment of jail up to six months is envisaged only in the extreme cases where a

periodical is published without a Certificate of Registration and the publisher fails to cease the printing of such publication even after six months of direction has been issued to that effect by the Press Registrar General.

- In the 1867 Act, only the DM could cancel the declaration of a periodical, the Press Registrar General did not have suo motu powers to cancel or suspend Certificate of Registration granted by it. The PRP Bill 2023 empowers the Press Registrar General to suspend/cancel the Certificate of Registration.

**TRIBUNALS CANNOT DIRECT GOVT. TO FRAME POLICY, SC JUDGMENT**



**Why in news?**

- The Supreme Court has clarified that tribunals functioning under the strict parameters of their governing legislation cannot direct the government to make policy.
- The Bench held that a Tribunal is also a quasi-judicial body, functioning within the parameters set out in the governing legislation. It cannot direct those responsible for making policy, to make a policy in a particular manner.

**Key Highlights:**

- The Bench was dealing with a question of whether the Armed Forces Tribunal (AFT) could have directed the government to make a policy to fill up the post of the Judge Advocate General (Air).
- The AFT was vested with the powers of a civil court. The Tribunal did not have the powers of the Supreme Court or the High Courts.
- Even the High Courts cannot, in the exercise of the powers under Article 226 of the Constitution, direct the government or a department to formulate a particular policy.
- The judgment said the creation or sanction of a scheme or policy regarding the service of defence personnel or their regularisation was the "sole prerogative of the government".

**About Armed Forces Tribunal (AFT):**

- Armed Forces Tribunal (AFT) has been set up under Armed Forces Tribunal Act, 2007 to provide for the

adjudication or trial of disputes and complaints with respect to commission, appointments, enrolment and conditions of service in respect of persons subject to the Army Act, 1950, the Navy Act, 1957 and the Air Force Act, 1950 and also to provide for appeals arising out of orders, findings or sentences of courts-martial held under the said Acts and for matters connected therewith or incidental thereto.

- It was inaugurated by the President of India on August 08, 2009.
- It was established to ensure speedy and inexpensive justice to Ex-Servicemen, their families and war-widows, besides the serving personnel of the Armed Forces.
- Armed Forces Tribunal has its Principal Bench at New Delhi and eight Regional Benches at Jaipur, Chandigarh, Lucknow, Guwahati, Kolkata, Chennai, Kochi and Mumbai.

**INTERNATIONAL RELATIONS**

**WOING INDIAN TOURISTS WITH VISA-FREE ENTRY**



**Why in news?**

- Malaysia has become the latest country to extend the advantage of visa-free travel to Indian citizens.
- The facility will be extended to Indian travellers till December 31, 2024 and will be valid for 30 days from the date of entry.
- At present there are around 26 countries that extend visa-free entry to Indian citizens for various reasons.

**What does the Malaysian decision imply?**

- Tourism has emerged as one of the key focus areas for Malaysia's post-COVID recovery strategy.
- According to the Malaysia Tourism Promotion Board, 10.7 million visitors chose to visit the country in 2022 bringing in more than \$28 billion to the economy.
- The recovery can be measured by the fact that during the peak COVID period of 2021, only 0.13 million tourists visited Malaysia.
- The visa-free facility to Indian (and Chinese) travellers is, therefore, aimed at making the country a more attractive destination for recreation seekers from two of the major Asian economies.

### Which are the other countries extending visa-free travel to Indians?

- Among the major regional tourism destinations, Sri Lanka and Thailand are the nearby economies that have also extended visa-free travel facility to Indians.
- Sri Lanka which was hit by an economic crisis in 2022 has a reason to make itself an attractive destination.
- Its visa-free policy for Indians is driven by both economic and political reasons.

### What are the categories of visa exemption?

- India has visa exemption agreements with many countries in the world that cater to multiple categories of visas.
- At least 34 countries across the world, have agreements with India that exempt visas for the holders of Indian diplomatic passports. These include Germany, France, Iran, Japan, Norway, Turkey and others.
- That apart there are at least 99 countries with which India has operational agreements for "diplomatic, service/official passport holders".
- There are 16 countries that offer visa-free travel facility for a certain period of time to ordinary Indian passport holders; this includes, Nepal, Bhutan, Fiji etc.
- According to the latest estimate available in the Passport Index website, there are at least 26 countries at present that provide visa-free facility to ordinary Indian passport holders.

### Is the visa-free facility permanent?

- Countries extend visa-free facility to Indian tourists for a certain amount of time or for a period depending on their advantage.
- But there are factors on the ground that may also determine whether a particular tourist is suitable for such facilities. Malaysia, for example, has mentioned that the scheme will be subjected to security clearance.
- Similarly, visa-free facility does not mean relaxation of security protocol in the port of entry. For example, in Dominica and El Salvador strict checks are carried out in airports to prevent illegal or undocumented immigration to the Americas from India.
- There are reports from places like Guatemala that extended visa-free travel to Indians but withdrew in view of fear of undocumented immigration.

### MALDIVES OPTS OUT OF HYDROLOGY AGREEMENT WITH INDIAN NAVY SIGNED IN 2019

#### Why in news?

- The Maldives has decided to pull out of the 2019 agreement for cooperation between the Indian Navy and the Maldives National Defence Force in the field of hydrology.



#### Details:

- The agreement was signed during Indian Prime Minister's visit to the Maldives in June 2019.
- The new Maldives government has opted not to renew the bilateral agreement, which expires on June 7, 2024.
- The agreement suggests that either country can choose not to renew the agreement six months before its expiration in June 2024.

#### Hydrographic Survey Agreement:

- The agreement allows India to perform a thorough investigation of the island nation's territorial waters, including reefs, lagoons, coastlines, ocean currents, and tidal levels.
- Hydrographic surveys are conducted by ships, which employ tools such as sonar to study the varied aspects of a body of water.
- These surveys help "map out water depth, the shape of the seafloor and coastline, the location of possible obstructions, and physical features of water bodies," to ensure the efficiency and safety of maritime traffic.

#### Surveys conducted by Indian Navy:

- In February and March of 2021, the Indian Naval Ship (INS) Darshak conducted the first Joint Hydrographic survey.
- Three collaborative hydrographic surveys have already been conducted, in 2021, 2022, and 2023.
- An area of 944 square kilometres was effectively surveyed; some of these areas had not been surveyed since 1853. They employed multi-beam echo sounders. The ship was also supposed to conduct tidal measurements in order to make accurate tidal predictions.
- The surveys were conducted to provide updated Navigational Charts/Electronic Navigational Charts of the locations, which would benefit industries like as tourism, fishing, agriculture, and so on.

#### New government in Maldives:

- The Muizzu-led government had said that it would review some of the agreements that the previous government had signed with India.
- It had asked India to withdraw its military personnel involved in operating the two naval choppers and a Dornier aircraft India had gifted to the Maldives.

➤ The Maldives had not participated in the NSA-level Colombo Security Conclave, in which it is a member-state along with India, Sri Lanka, and Mauritius.

**RED SEA SEES SHARP RISE IN MISSILE ATTACKS, SAYS IFC-IOR**



**Why in news?**

- The Red Sea region has witnessed a significant surge in maritime security incidents, including missile attacks over the past two months, with the week from December 14 to 20 reporting the highest number of incidents in this period.
- According to data released by the Gurugram-based Information Fusion Centre - Indian Ocean Region (IFC-IOR), there were nine maritime security threats recently, a stark increase from the previous weeks.

**Causes:**

- The primary cause behind this escalation appears to have been the uptick in Houthi attacks originating from Yemen.
- The Houthi rebels have been targeting vessels they suspect are heading to or from Israel, a response to Israeli actions in Gaza. Israel's substantial offensive in Gaza was triggered by a terror attack by Hamas in October.
- The trend of rising security concerns continued from the week of November 30 to December 6, where five incidents were recorded.

**Recent instances:**

- On December 13, the tanker Mt Ardmore Encounter faced a missile attack from Yemen's Hodeidah, with two missiles being launched.
- Simultaneously, a US Navy ship successfully intercepted an unmanned aerial vehicle near Port Hodeidah.
- On December 14, MV Maersk Gibraltar became the target of a ballistic missile attack north of the Bab el Mandeb strait.
- Fortunately, the missile exploded nearby, ensuring the safety of both the crew and the vessel. Two incidents unfolded on December 15, involving projectiles hitting vessels. MV Al Jasrah was struck by a projectile, and concurrently, MSC Palatium III was hit by a missile,

both incidents originating from the Yemen region. In both cases, all crew members were reported safe.

- On December 16, a US Navy ship took down 14 unmanned aerial vehicles in the Red Sea off the coast of Yemen, while a UK Navy ship shot down another UAV off the Yemen coast.
- On December 18, MT Swan Atlantic faced a projectile attack resulting in an explosion on the port quarter of the vessel.
- Similarly, MSC Clara reported an explosion in the vicinity of Mokha, Yemen. Importantly, in both instances, the vessel and crew members were reported safe.

**Alternative routes:**

- The situation has prompted major shipping companies to rethink their routes, pausing passage through the Red Sea and opting for longer, alternative routes.
- This shift is likely to have a profound impact on global trade, potentially leading to disruptions in the supply chain and subsequently affecting oil and food prices.
- The extended travel times for vessels may contribute to increased global inflation.

**HOW IS THE U.K. CRACKING DOWN ON IMMIGRATION?**



**Why in news?**

- The government of the U.K. recently proposed new immigration rules to cut the net flow of immigration to the country, primarily by tightening visa requirements across several categories of workers seeking to move to the U.K. from abroad.
- Immigration policy has always been a key policy plank for the government headed by the Conservative Party, and there has been concern that in recent years the number of those immigrating to the U.K. compared to those emigrating abroad has risen sharply.

**Why is the United Kingdom tweaking its immigration rules?**

- According to the U.K.'s Office for National Statistics (ONS), net migration into the U.K. touched a record high of 7,45,000 in 2022, with reports suggesting that the number of work permits issued to foreign

technology professionals in particular rose from 39,899 in 2021 to 52,686 in 2022, marking a five-year high.

- Specifically, it was the category of web design and development that saw the largest percentage increase with 76% more work permits issued during this period.
- Of the 11,80,000 people who entered the U.K. during the year ending June 2023, with the intention to stay for at least one year, the greatest majority of migrants came from outside the EU.
- According to the ONS, students comprised the largest cohort of non-EU migrants, both in 2023 and 2022. However, the proportion of workers arriving to take on roles in healthcare, to make up for the severe staff shortage in the NHS and social care, have also been rising steadily.
- The nations that sent the most migrants to the U.K. from outside of the EU were, in order, India (which sent 2,53,000 people), Nigeria (1,41,000), China (89,000), Pakistan (55,000) and Ukraine (35,000). Of these individuals, a total of 39% entered the U.K. for the purpose of pursuing studies, 33% to work, and 9% for humanitarian reasons.

### What are the proposed new regulations?

- The new visa regulations propose to clamp down on the dependents of students arriving in the U.K. as well as other categories of foreign nationals with family ties in the country.
- Skilled workers seeking visas will be impacted by an increase in the minimum salary requirement.
- Health and social care workers, who comprise nearly 50% of work visa migrants, will reportedly be exempt from the increase, suggesting that the maximum impact will be on middle-skilled jobs including those working in the hospitality industry.
- Other changes include a ban on immigrant care workers bringing family members with them, a review of student visas for graduates to prevent "abuse" of the system including a ban on students switching to work visas before completing their studies, and an increase in the immigration health surcharge paid to the NHS by annual fee visa holders, from £624 to £1,035.

### What is the broader impact of the proposed changes?

- Following a sharp backlash from immigration advocacy groups, the U.K. government has already walked back its proposal to raise minimum salary requirements for U.K. citizens to bring in non-U.K. family members, reducing the threshold amount from £38,700 to £29,000, "with further increases at unspecified dates thereafter."
- Meanwhile advocacy groups such as Reunite Families, are said to be exploring legal avenues to challenge the proposed new immigration rules which amount to being "punished for falling in love".

## WHAT'S THE LATEST BLIP IN INDIA-MALDIVES TIES?



### Why in news?

- Earlier in December, the Maldives Cabinet decided against renewing a Memorandum of Understanding (MoU) with India for cooperation in hydrography. The agreement, which was signed in 2019, is due to expire in 2024.
- Coming soon after newly elected President Mohamed Muizzu's pledge to send back Indian troops currently stationed in the Indian Ocean archipelago, the move was yet another indication of his government's intention to reverse the former Ibrahim Mohamed Solih administration's 'India first' policy.

### What is hydrography?

- It is the science of studying oceans, seas, and other water bodies, by compiling and analysing data, maps, and charts.
- It looks at measuring and describing the physical attributes of water bodies and predicting how they might change over time.
- While it is said to be undertaken primarily for safety of navigation, it also supports other activities, such as economic development, security and defence, scientific research, and environmental protection. Hydrographical measurements include tidal, current and wave information.

### What is India's expertise?

- India has been an active member of the International Hydrographic Organization (IHO) since 1955. The Indian Naval Hydrographic Department (INHD) was established in 1874 in Kolkata. It is the nodal agency for hydrographic surveys and has a fleet of indigenously built modern survey ships.
- India partners with many countries in the Indian Ocean Region and African and East Asian countries such as Mauritius, Seychelles, Tanzania, Maldives, Mozambique, Vietnam, Myanmar, Kenya, and Sri Lanka.
- The INHD's role has broadened over time, owing to the heightening global character of hydrography and "its growing potential as a force multiplier" in terms of maritime diplomacy. Personnel from 39 countries

have trained at the National Institute of Hydrography, functioning under the INHD.

### Why was the 2019 MoU significant?

- The MoU was signed in June 2019, during Prime Minister Narendra Modi's state visit to the Maldives.
- It was his second visit to the Maldives since he participated at President Solih's swearing-in ceremony in 2018.
- The first meeting of the Joint Commission on Hydrography was held in the Maldives in September 2019.
- Following the agreement, the Maldives National Defence Force (MNDF) and the Indian Navy have carried out three joint hydrographic surveys in 2021, 2022, and 2023.

### Why has the Cabinet decided against renewing the agreement?

- The decision was aligned to the current administration's pledge to terminate all agreements with foreign parties that are detrimental to or endanger the national security of the Maldives.
- The message appeared to be in line with new President's broad election campaign, pledging to remove Indian troops from the country and "restoring the Maldives's sovereignty".
- Once he assumed charge, the core demand of the 'India Out' campaign led by former President Abdulla Yameen, found mention in President Muizzu's first set of official announcements.

### What does this mean for India-Maldives ties?

- Going by recent developments, it appears as if India will have to brace for a challenging phase of its Maldives partnership.
- Maldives is a member of the Colombo Security Conclave, an initiative aimed at enhancing Indian Ocean maritime security, that includes India, Sri Lanka, and Mauritius.
- However, the Maldives skipped the latest round of the Conclave's NSA-level meet held in Mauritius.
- It coincided with Maldivian Vice-President Hussain Mohamed Latheef's visit to China, to attend the China-Indian Ocean Region Forum on Development Cooperation, where he said the Maldives was "eager to explore novel avenues of collaboration and cooperation with China".

## THE EVOLVING ROLE OF THE COLOMBO SECURITY CONCLAVE

### Why in news?

- In early December, India's National Security Adviser (NSA) took part in the sixth NSA meeting of the Colombo Security Conclave (CSC).
- It is imperative for India to continue pushing for a proactive CSC to address the challenges in the Indian Ocean.



### Details:

- The meeting reviewed the developments and progress made by the CSC in 2022 and agreed upon a road map for the year 2024 to promote a safe, secure, and stable Indian Ocean.
- The meeting also included member-states, Mauritius and Sri Lanka, and observer-states, Bangladesh and Seychelles.
- The Maldives, now under a new dispensation, was the only member-state that was absent, underscoring the impact of domestic politics over regional collaboration.

### Evolving dynamics:

- The organisation came into its own in 2011, with Sri Lanka joining India and the Maldives for a trilateral maritime security grouping but came to a standstill after 2014 due to rising tensions between India and the Maldives.
- In 2020, India not only pushed for the revival and institutionalisation of the organisation but also expressed interest in expanding the CSC to Mauritius, the Seychelles, and Bangladesh. The push for the CSC demonstrates India's evolving strategic vision for the Indian Ocean.
- The Indian Ocean is at the heart of an evolving multipolar world today, with extra-regional powers competing to make inroads in the region. This competition will further increase as the Indo-Pacific's importance grows.

### Opportunity for India:

- The lack of capacity of island nations to secure the seas and counter transnational threats has continued to motivate India to assist them in defence and security-related capacity building, infrastructure development, and equipment provision.
- India has also played a vital role as the first responder in the region, be it to avert coups or to offer humanitarian and economic assistance during COVID-19 and multi-faceted crises.
- The CSC offers India an opportunity to institutionalise its role, shape the regional security architecture, and better address the existing and emerging threats.

**China factor:**

- Since the early 2000s, China has invested substantively in the Indian Ocean with its Belt and Road Initiative (BRI) projects, helping it access the Indian Ocean.
- China's outreach to the Indian Ocean is to control the crucial sea lines of communication and trade and to limit India's influence and presence. Today, China is not only strengthening its naval capabilities; it also maintains strong defence relationships with states in the Indian Ocean region and also conducts regular maritime exercises in the Ocean.
- It has established a base in Djibouti and controls Sri Lanka's Hambantota port. It continues to use scientific ships to map the Indian Ocean bed.
- Finally, it also wants to counter the prevailing security architecture in the Indian Ocean by institutionalising its presence through platforms such as the Indian Ocean Region Forum on Development Cooperation.

**Pillars:**

- The CSC has focused on five pillars; maritime security and safety; countering terrorism and radicalisation; trafficking and transnational crime; cyber-security and protecting critical infrastructure, and humanitarian assistance and disaster relief.
- It is with these sectors of cooperation that India hopes to better understand and respond to threats from the Indian Ocean and continue being a preferred partner for the Indian Ocean states.
- This strategic accommodation and flexibility is contributing to the security of the Indian Ocean. Since 2021, the CSC has investigated terrorism and terror financing, narcotics trafficking, cybercrime and security, marine pollution, maritime law, and coastal security.

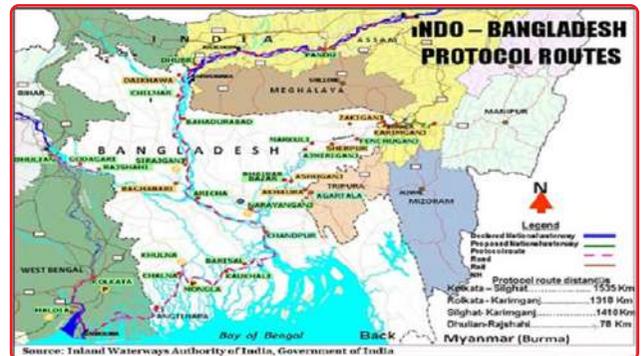
**Engagements:**

- In 2022, for the first time, the organisation held a conference of oceanographers and hydrographers and another conference on coastal security.
- The next iterations of these conferences are scheduled for 2024. Joint working groups have already been established, or are being finalised, on terrorism, cyber-security, humanitarian aid and disaster relief (HADR), trafficking and transnational organised crimes.
- Apart from regular NSA and Deputy NSA meetings, the countries are collaborating on capacity-building in sectors such as counter-terrorism, police, law enforcement, and cyber-security.

**Way Forward:**

- For India, whose ambitions, responsibilities, and threats have increased significantly in the last decade, the CSC will remain an important instrument to help it consolidate its regional leadership.

## INDIA, BANGLADESH AGREE TO EXTEND CRUCIAL INDO- BANGLADESH PROTOCOL ROUTE

**Why in news?**

- Recently, the three high-level talks between India and Bangladesh, including shipping secretary-level talks, 22nd meeting of standing committee under PIWT&T and the 3rd meeting of inter-governmental committee on use of Chattogram and Mongla Ports for to-and-fro movement of goods, successfully concluded in Dhaka.
- Issues like easing visa issuance, shore-leave facility and repatriation for seafarers were deliberated upon.

**Key Highlights:**

- India and Bangladesh have agreed to extend Indo-Bangladesh Protocol (IBP) route and declare Safardighi in West Bengal as the new port of call under Protocol on Inland Water Transit & Trade (PIWT&T).
- Both sides agreed to form a technical team immediately to study inclusion of Chandpur-Chittagong stretch as IBP route under PIWT&T.
- Bangladesh agreed to form a joint committee to implement a common Automatic Identification System (AIS) on the IBP route for better vessel navigation and tracking.
- Bangladesh agreed to include Mongla-Jamtola stretch for passenger and cruise vessels to visit the Sunderbans area in Bangladesh.
- Both sides agreed to examine inclusion of Payra sea port in the agreement on the use of Chattogram and Mongla Ports (ACMP) for movement of goods between the two countries.

**Way Forward:**

- Both countries shared the water routes and coastal routes for transportation of the cargo and passengers on Indo-Bangladesh Protocol Route and Coastal routes.
- These routes are important since they provide alternative connectivity to the northeast through Bangladesh.

## ECONOMY

### CODEX ALIMENTARIUS COMMISSION PRAISES INDIA'S STANDARDS ON MILLETS



#### Why in news?

- The Codex Alimentarius Commission (CAC) has praised India's Standards on Millets and accepted its proposal for the development of global standards for millets during its 46th session held in Rome, Italy.

#### India's proposal:

- India has framed a comprehensive group standard for 15 types of millets specifying 8 quality parameters, which received resounding applause at the international meet.
- Codex currently has standards for Sorghum and Pearl Millet.
- India put forward a proposal for the development of global standards for millets, particularly for Finger millet, Barnyard millet, Kodo millet, Proso millet and Little millet as group standards as in case of pulses.
- The proposal was unanimously endorsed in the session at FAO Headquarters in Rome.

#### Group standards on millets:

- The group standards on millets framed by FSSAI for 15 types of millets, which specify 8 quality parameters i.e., maximum limits for moisture content, uric acid content, extraneous matter, other edible grains, defects, weevilled grains and immature and shriveled grains, will act as an important foundation for the development of global standards.
- The existing Codex standards for Sorghum and Pearl millet would also be reviewed while making the group standards for millets.

#### India's proposals so far:

- The current session marks the 60th anniversary of the Codex Alimentarius Commission, of which India has been a member since 1964.
- India has so far chaired 12 EWGs and co-chaired 28 EWGs relating to various Codex standards/texts and guidelines.
- Important standards proposed by India include Standard for Okra, BWG Pepper, Aubergines, Dried and

Dehydrated Garlic, Dried or Dehydrated Chilli Pepper and Paprika, Fresh Dates, Mango Chutney, Chili Sauce, Ware Potatoes and labelling requirements for non- retail containers.

#### About Codex Alimentarius Commission (CAC):

- It is an intergovernmental body established jointly by the UN's Food and Agriculture Organisation (FAO) and the World Health Organisation (WHO) in 1963, within the framework of the Joint Food Standards Programme.
- The Secretariat of the CAC is hosted at FAO headquarters in Rome.
- It was established to protect the health of consumers and ensure fair practices in the food trade.
- It meets in regular session once a year alternating between Geneva and Rome.
- Currently, it has 189 Codex Members made up of 188 Member Countries and 1 Member Organization (The European Union).

### SKILL DEVELOPMENT IN RURAL AREAS



#### Why in news?

- Recently, the Minister of State for Skill Development and Entrepreneurship, in a written reply in the Lok Sabha gave detail of skill development in rural areas.
- Skill India Mission aims at Skilling, Re-skilling and Up-skilling to ensure all young Indians are prepared for the large number of opportunities coming up as the economy expands and India moves from the 10th largest economy to 3rd largest economy in the world.

#### Details:

- SIM is aimed at giving access to all youth in India to get future ready, Industry ready skill.
- Under the SIM, the Ministry of Skill Development and Entrepreneurship (MSDE) provides skill, re-skill and up-skill training to youth across the country through a comprehensive network of skill development centres/institutes under various schemes viz. Pradhan Mantri Kaushal Vikas Yojana (PMKVY), Jan Sikhshan Sansthan (JSS), National Apprenticeship Promotion Scheme (NAPS) and Craftsman Training Scheme (CTS) through Industrial Training Institutes (ITIs).

**Ongoing schemes:****Pradhan Mantri Kaushal Vikas Yojana (PMKVY):**

- PMKVY Scheme is for imparting skill development training through Short-Term Training (STT) and Up-skilling and Re-skilling through Recognition of Prior Learning (RPL) to youth across the country including rural areas.
- Under PMKVY, placement opportunities have been provided to STT certified candidates and since Recognition of Prior Learning (RPL) involves the process of certification of already existing skills, it is not linked with placements.

**Jan Shikshan Sansthan (JSS) Scheme:**

- The main target of the JSS is to impart vocational skills to the non-literates, neo-literates and the persons having rudimentary level of education and school dropouts upto 12th standard in the age group of 15-45 years, with due age relaxation in case of "Divyangjan" and other deserving cases.
- Priority is given to Women, SC, ST, OBC and Minorities in the rural areas and urban low-income areas.

**National Apprenticeship Promotion Scheme (NAPS):**

- This Scheme is for promoting apprenticeship training and increasing the engagement of apprentices by providing financial support to industrial establishments undertaking apprenticeship programme under the Apprentices Act, 1961.
- Training consists of Basic Training and On-the-Job Training / Practical Training at workplace in the industry.

**Craftsmen Training Scheme (CTS):**

- This scheme is for providing long-term training through Industrial Training Institutes (ITIs) across the country.
- The ITIs offer a range of vocational/skill training courses covering a large number of economic sectors with an objective to provide skilled workforce to the industry as well as self-employment of youth.

### STEPS BY GOVERNMENT FOR PROMOTING GROWTH AND SUSTAINABILITY IN URBAN SECTOR

**Why in news?**

- Recently, the minister of state in the Ministry of Housing and Urban Affairs, in a written reply in Lok Sabha discussed the steps taken by government for promoting growth and sustainability in urban sector.

**Urban Planning:**

- As per the 12th Schedule of the Constitution of India, urban planning is a State subject. Government of India supplements the efforts of the States through schematic interventions/ advisories.



- It provides financial and technical support to the States. State Town Planning Departments and Urban Development Authorities act as city and state level urban anchors.

**Initiatives for promoting growth and sustainability in urban sector:****Swachh Bharat Mission:**

- It is accelerating change for safe sanitation, waste management with focus on door to door collection/ segregation, waste processing etc.

**Smart Cities Mission:**

- It aims at promoting cities that provide core infrastructure, clean and sustainable environment and give a decent quality of life to their citizens through the application of 'smart solutions'.
- The focus is on sustainable and inclusive development by creation of replicable models which act as lighthouses to other aspiring cities.

**National Urban Livelihood Mission:**

- It aims to reduce poverty and vulnerability of the urban poor households by enabling them to access gainful self employment and skilled wage employment opportunities.
- The mission also aims at providing shelters equipped with essential services to the urban homeless in a phased manner and would also address livelihood concerns of the urban street vendors.

**PM SVANidhi scheme:**

- It is a special micro-credit facility launched by ministry for providing affordable loans to street vendors.

**Pradhan Mantri Awas Yojana (Urban) Mission:**

- It intends to provide housing in urban areas. The Mission addresses urban housing shortage among

EWS/LIG and MIG categories including slum dwellers by ensuring pucca houses.

- It provides Central Assistance to the implementing agencies through States/Union Territories (UTs) and Central Nodal Agencies (CNAs) for providing houses to all eligible families/ beneficiaries.

**In order to incentivize States to undertake urban planning reforms, two schemes were launched:**

- Scheme for Special Assistance to States for Capital Investment 2022-23 – Part – VI (Urban Planning Reforms) (allocation - Rs. 6000 Cr):
- The reform components include Modernization of Building Bylaws, Adoption of Transferrable Development Rights (TDR), Implementation of Local Area Plans (LAP) and Town Planning Schemes (TPS), Implementation of Transit-oriented Development (ToD), Creation of Sponge Cities, Removing Taxation for running the Buses for Public Transport.
- Funds amounting to Rs. 4093.16 Cr were released by the Department of Expenditure, Ministry of finance to 12 States.

**Scheme for Special Assistance to States for Capital Investment 2023-24 – Part – III (Urban Planning Reforms) (allocation – Rs. 15000 Cr):**

- The reform components include Augmentation of human resources for strengthening urban planning ecosystem, Implementation of Town Planning Scheme (TPS)/ Land Pooling Scheme, Modernization of Building Bylaws, Promoting in-situ slum rehabilitation, Transit-Oriented Development (TOD), Transferable Development Rights as planning tool, Strengthening natural ecosystems of urban areas through urban planning.

- Specifically referring to the FTX collapse in November 2022, it highlights potential risks associated with MCIs that combine different activities within the platform.

**How does the report define MCIs?**

- The report defines MCIs as individual firms, or groups of affiliated firms that offer a range of crypto-based services, products and functions which primarily revolve around operating of the trading platform. Examples include Binance, Bitfinex and Coinbase.
- In the traditional financial landscape, the functions are provided by separate entities, instead of the same entity. This prevents conflict of interest and promotes market integrity, investor protection and financial stability.
- The primary source of revenue for these platforms are the transaction fees generated from trading-related activities, the traded security here being self-issued crypto assets. Trades from alternative platforms may also indirectly drive additional demand for other services offered by the platform.
- These may include prepaid debit cards and lending, among other services. This shows that the aspirations of MCIs extend beyond just trading to becoming a “one-stop shop” for crypto-based services.
- FSB’s report observes that the magnitude of these revenue sources is unclear because of the limited publicly disclosed information.

**What about transparency?**

- The report observes that most MCIs are not transparent about their corporate structure. Further, they are privately held. Even if they disclose information, it is typically for a small part of their business, specific to a jurisdiction.
- Much of the available information has surfaced through press coverage, court filings and regulatory actions and not public disclosures.
- It observed that MCIs failed to create a “meaningful separation” between potentially conflicting business lines, and provide clear account of transactions and activities or audit practices, among other things.
- The report suggests this could be intentional, to limit understanding of their vulnerabilities, economic models and activities, thus, to also evade regulatory oversight. Overall, this translates to lowered or non-existent oversight parameters for management of risk and governance frameworks.

**What about spillovers?**

- Based on available evidence, the threat to global financial stability and to the real economy from the failure of an MCI is presently “limited.”
- However, recent experience about failure or closure of “crypto-asset-friendly” banks reveal the prevalence of concentrated deposit exposures to firms whose business models rely in some form on crypto assets.

**FSB CONCERNS ABOUT CRYPTO ASSET INTERMEDIARIES**



**Why in news?**

- The international Financial Stability Board (FSB)’s latest report on crypto-asset intermediaries sought measures to enhance cross-border cooperation and information sharing among local authorities.
- This is to effectively regulate and address gaps in multi-function crypto-asset intermediaries (MCIs) operating globally.

- In March 2023, Silvergate Bank had to wind down its operations and voluntarily liquidate. This was after the FTX collapse and an ensuing loss of confidence (in crypto-assets) that resulted in a 'run-off' (investors moving away from riskier to safer assets).

### 13 STATES, UTS AMONG 'ACHIEVERS' IN LOGISTICS PERFORMANCE INDEX, DPIIT REPORT



#### Why in news?

- Recently, the Commerce and Industry Ministry released a report on the logistics index chart 2023 recently.
- The index is an indicator of the efficiency of logistical services necessary for promoting exports and economic growth.

#### Key Highlights:

- Andhra Pradesh, Karnataka, Tamil Nadu, Chandigarh, and Gujarat are among the 13 states and Union Territories that have again been categorised as 'achievers'.
- As against 15 states and UTs, the number has reduced to 13 as Himachal Pradesh and Uttarakhand have slipped into 'aspirers' and 'fast movers' categories, respectively, in 2023.
- Steps taken by Sikkim and Tripura have helped them move up the ladder to the "achievers" category from "fast movers" in 2022.
- The other states and UTs in the "achievers" category are Delhi, Assam, Haryana, Punjab, Telangana, and Uttar Pradesh.
- Kerala, Maharashtra, Madhya Pradesh, Rajasthan, Uttarakhand, Arunachal Pradesh, Nagaland, Andaman and Nicobar, Lakshadweep, and Puducherry have been categorised as "fast movers" in the report.
- Those in the "aspirers" category include Goa, Odisha, West Bengal, Bihar, Chhattisgarh, Himachal Pradesh, Jharkhand, Manipur, Meghalaya, Mizoram, Daman and Diu, Dadra and Nagar Haveli, Jammu and Kashmir, and Ladakh.

#### LEADS report

- The report ranks states on the basis of their logistics ecosystem, highlights the key logistics-related

challenges faced by the stakeholders and includes suggestive recommendations, according to the fifth LEADS (Logistics Ease Across Different States) 2023 report.

- The index aims at enhancing focus on improving logistics performance across states, which is essential for improving the country's trade and reducing transaction costs.
- The logistics sector will play a key role in taking the country's economy to about USD 35 trillion by 2047.
- The LEADS report will play a pivotal role in instilling healthy competition among states/UTs to enhance logistics performance. LEADS was conceived on the lines of the Logistics Performance Index (LPI) of the World Bank in 2018.
- While the LPI relies entirely on perception-based surveys, LEADS incorporates perception and objectivity, thereby enhancing the robustness and comprehensiveness of this exercise.

➤

#### Key Pillars:

- The report assesses states' performance across the key pillars of Logistics Infrastructure, Logistics Services and Operating and Regulatory Environment, and empowers the state/UT governments by providing region-specific insights for informed decision-making and comprehensive growth.
- It is based on a pan-India primary survey conducted between May and July 2023, covering over 7,300 responses across 36 states/UTs.

### WORLD LARGEST GRAIN STORAGE PLAN



#### Why in news?

- Recently, the Minister of Cooperation, in a written reply to a question in the Lok Sabha, discussed about the World's largest grain storage plan.

#### About World's Largest Grain Storage Plan:

- The Government on 31st May 2023 has approved the "World's Largest Grain Storage Plan in Cooperative Sector", which is being rolled out as a Pilot Project in different states/UTs of the country.
- The Plan entails creation of various agri infrastructure at PACS level, including setting up decentralized

- godowns, custom hiring center, processing units, Fair Price Shops, etc. through convergence of various existing schemes of the Government of India (GoI), such as, Agriculture Infrastructure Fund (AIF), Agricultural Marketing Infrastructure Scheme (AMI), Sub Mission on Agricultural Mechanization (SMAM), Pradhan Mantri Formalization of Micro Food Processing Enterprises Scheme (PMFME), etc.
- Under these schemes, PACS can avail subsidies and interest subvention benefits for construction of godowns/storage facilities and setting up of other agri infrastructure.
  - Further, NABARD is also extending financial support to PACS by refinancing them at highly subsidized rates of around 1 percent, after incorporating the benefits of 3% interest subvention under AIF scheme for projects up to Rs. 2 Crore.
  - Therefore, the plan aims to strengthen the economic condition of PACS by diversifying their business activities and giving them additional sources of revenue thus improving their financial sustainability.

#### Implementation:

- The Pilot project is being implemented by National Cooperative Development Corporation (NCDC) with the support of NABARD, Food Corporation of India (FCI), Central Warehousing Corporation (CWC), NABARD Consultancy Services (NABCONS), National Buildings Construction Corporation (NBCC), etc. in different States/ UTs. Consultancy support is also being extended to PACS through these agencies under the project.
- In order to ensure accountability and smooth, effective and transparent implementation of the plan, Ministry of Cooperation has constituted an Inter-Ministerial Committee (IMC), which is authorized to modify guidelines/ implementation methodologies of the schemes identified for convergence, as and when need arises.
- A National Level Coordination Committee (NLCC) has also been constituted having members from Ministry/ Departments, Central Government agencies concerned to steer the overall implementation of the Plan and reviewing the progress of implementation, etc.
- To monitor the implementation of the project and to ensure its seamless integration with the existing policies/ programmes at State level, State Cooperative Development Committee (SCDC) at State level and District Cooperative Development Committee (DCDC) in each District of the State/UT have also been constituted.

#### The project will also provide various benefits to the farmers, including the following:

- Farmers will be able to store their produce in the godown constructed at PACS and avail bridge finance

for the next cycle of crop and sell the produce at a time of their choice, or sell their whole crop to the PACS at Minimum Support Price (MSP), which would enable them to avoid distress sale of crops.

- They will be able to get various agri inputs and services at the Panchayat/ village level itself.
- Through diversification of business, farmers will be able to get additional sources of income.
- Through integration with the food supply management chain, farmers will be able to expand their market size and realize better value for their produce.
- Creation of adequate food grain storage capacity at PACS level will help in reduction of post-harvest loss, thus enabling farmers to earn better prices.
- It would help in ensuring food security at Panchayat/ village level across the country, thereby benefitting the consumers.

### CENTRE LAUNCHES FOREST CERTIFICATION SCHEME TO COUNTER FOREIGN AGENCIES



#### Why in news?

- Amid rising international concerns on deforestation and illicit trade in timber, the government has launched its own "national" forest certification scheme to validate entities that adhere to sustainable practices in management of forests and its products.
- The Indian Forest and Wood Certification Scheme (IFWCS) will offer an alternative to the private foreign certification agencies that have been operating in the Indian market for the last two decades.

#### New standards:

- The launch of the certification follows the development of new standards for forest management that will be mandatory for all forest divisions in the country.
- Forests in India are managed according to their respective working plans. These working plans have now been updated with the newly-developed Indian Forest Management Standards that contains eight criteria, 69 indicators and 254 verifiers.
- These standards will be mandatory for all forest divisions in the country to implement.

**Types of certification:**

- ⇒ IFWCS would offer certification for sustainable forest management, sustainable management of trees outside forests like those in plantations, and chain of custody which is a sort of guarantee of the traceability of a forest product throughout its supply chain, from the origins to the market.
- ⇒ Certification may be of use to forest management units, corporations, or wood-based industries, tree growers, timber or NTFP (Non-Timber Forest Produce) traders, saw millers, exporters or importers of wood-based and NTFP-based products, and other end-user industries.

**Climate change concerns:**

- ⇒ Europe and the United States happen to be the largest export markets for India's forest-based products, particularly handicraft and furniture.
- ⇒ These markets have been tightening the rules for import of forest products because of greater sensitivity around deforestation on climate change concerns.
- ⇒ At the Glasgow climate change conference in 2021, over 100 countries had come together in a pledge to halt, and reverse, deforestation by 2030.

**Way Forward:**

- ⇒ Right now, it is a government-initiated and government-backed scheme, but eventually it is likely to evolve into an independent entity like the Bureau of Indian Standards or Quality Council of India.

**T+0, INSTANT SETTLEMENT CYCLE****Why in news?**

- ⇒ The Securities and Exchange Board of India (SEBI) has proposed the introduction of a facility for clearing and settlement of funds and securities on T+0 (same day) and instant settlement cycle on an optional basis.
- ⇒ The facility will be in addition to the existing T+1 (trade plus one day) settlement cycle in the secondary markets for the equity cash segment.

**What is the current settlement cycle followed in the securities market?**

- ⇒ SEBI has shortened the settlement cycle to T+3 from T+5 in 2002 and subsequently to T+2 in 2003.

- ⇒ At present, the settlement of funds and securities happens on the T+1 cycle.
- ⇒ It was introduced in 2021 in a phased manner and was fully implemented in January 2023. Under it, securities and funds are settled by the next day of the trade.

**What has SEBI proposed now?**

- ⇒ It said that for the equity cash segment, in addition to the existing T+1 settlement cycle, a shorter settlement cycle may be introduced as an option. It proposed to implement it in two phases – Phase 1: T+0 Settlement Cycle and Phase 2: Instant Settlement Cycle.
- ⇒ In Phase 1, an optional T+0 settlement cycle (for trades till 1:30 PM) is envisaged, with settlement of funds and securities to be completed on the same day by 4:30 PM.
- ⇒ In Phase 2, an optional immediate trade-by-trade settlement (funds and securities) may be carried out. In the second phase, trading will be carried out till 3.30 pm.
- ⇒ SEBI has suggested that to begin with, T+0 settlement shall be made available in the top 500 listed equity shares based on the market capitalisation. This will be done in three tranches of 200, 200, and 100, from lowest to highest market cap.
- ⇒ The surveillance measures applicable in the T+1 settlement cycle will also apply to securities in the T+0 settlement cycle. Securities under the trade-for-trade settlement will not be permitted for T+0.

**What would be the features of the proposed T+0 settlement mechanism?**

- ⇒ It is observed that a high percentage of retail investors bring upfront funds and securities before placing an order.
- ⇒ For the period June 2023, for around 94 per cent of delivery-based trades with value up to Rs 1 lakh per transaction, investors made early pay-in of funds and securities.
- ⇒ An instant settlement mechanism would enable instant receipt of funds and securities, vis-a-vis existing pay-out on T+1 day. It would eliminate the risk of settlement shortages since both funds and securities will be required to be available before placing the order.
- ⇒ It will strengthen investor protection by enhancing the control of the investor over the securities and funds as funds and securities would be credited into the client's account directly for those who are trading through blocked amounts using the UPI facility (UPI Clients).
- ⇒ Providing the option for instant settlement will help establish Indian equities as an asset class with the features of resilience, low cost and time for transaction, superior in all ways to emerging claimants of alternative asset classes.

**What are the benefits of the new mechanism?**

- For clients, the option is expected to provide flexibility in terms of faster pay-out of the funds against the securities to the sellers and faster pay-out of securities against the funds to the buyers.
- For the securities market ecosystem, the option is expected to provide flexibility in terms of faster pay-out of the funds against the securities to the sellers and faster pay-out of securities against the funds to the buyers.

**RED SEA ATTACKS, PANAMA CANAL DROUGHT, IMPACT ON GLOBAL TRADE**



**Why in news?**

- Amid the recent attacks on ships passing through the Red Sea trade route in West Asia, one ship on its way to India was struck by a drone attack on Chemical tanker MV Chem Pluto, roughly 200 nautical miles (370 km) off the coast of Gujarat.
- Two crucial choke points; the Suez Canal and the Panama Canal threaten to disrupt over a third of global trade.
- This comes amid already slowing demand in the West and a property crisis in China that led the World Trade Organization (WTO) to lower its goods trade forecast by as much as 50 per cent.

**Details:**

- The Red Sea attacks have been carried out by Yemen-based Houthi rebels, who have been in a civil war with the Yemeni government for about a decade.
- They say the attacks are to protest Israel's military offensive in Gaza.
- While the US-led maritime security coalition has swiftly announced countermeasures, indicating the importance of the route for world trade.

**What do the ongoing Red Sea and Panama Canal crises mean for world trade?**

- Currently, two important shipping routes are facing blockages. While the Bab-el-Mandeb Strait that leads to the Suez Canal in the Red Sea region connects Asia to Europe, the 100-year-old Panama Canal connects the Atlantic and Pacific Oceans.

- Both these routes are among the busiest in the world and a blockage results in forcing global shipping lines to take longer alternate routes, pushing up freight rates.
- The disruption at the Red Sea route, for instance, is estimated to push the prices of Indian agricultural products by 10 to 20 per cent, as shipments would be routed through the Cape of Good Hope.
- This comes at a time when much of the West is witnessing higher interest rates to curb inflation. Higher prices could further fuel demand concerns for global and Indian exporters.

**Why is trade via the Panama Canal slowing?**

- Shipping via the Panama Canal has dropped by over 50% due to drought conditions at the 51-mile stretch. Due to the shortage of water, ships moving from Asia to the US are being forced to use the Suez Canal, which takes six more days compared to the Panama Canal.
- Moreover, Panama is facing its driest rainy season in decades, raising fears of prolonged canal bottlenecks.
- According to S&P Global, rather than taking longer voyages through alternative routes, LNG vessels are participating in pricey auctions to expedite their transit through the Panama Canal.

**Why are oil flows to India immune to attack in the Red Sea?**

- With global shipping majors such as Maersk avoiding transit through the Red Sea, global oil and petroleum product flows through the maritime channel have declined by over 50 per cent in December from their regular levels.
- However, India has not faced a disruption in its Russian oil imports. Russia is perceived as Iran's ally and as the Houthi rebels are widely believed to be backed by Iran, its tankers have been passing through.
- In a recent report, Goldman Sachs said that it does not expect the disruptions in the Red Sea to significantly impact international oil prices as global oil production is unlikely to be directly affected.

**How have the Red Sea attacks impacted freight rates?**

- Ever since the attacks along the Bab-el-Mandeb Strait began earlier this month, global shipping firms have begun imposing war risk surcharges over and above the normal freight rates.
- Indian exporters said that freight rates for Indian shipments headed to Europe and Africa could surge as much as 25-30 per cent if the ongoing security concern along the Red Sea trade route continues.
- This is troubling, as the European Union is one of India's second-largest export destinations.
- Slowing demand from the region has impacted India's labour-intensive sectors, such as textiles, gems and jewellery exports.

## SECURITY

### IDEX-DIO SIGNS 300TH CONTRACT FOR DEFENCE INNOVATION



#### Why in news?

- Innovations for Defence Excellence (iDEX), the flagship initiative of the Department of Defence Production, has reached a milestone with the signing of its 300th contract recently.

#### GaN components:

- The contract relates to the design and development of advanced Gallium Nitride Semiconductors which is essential for the next generation of wireless transmitters in defence applications ranging from radars to EW (Electronics Warfare) jammers.
- Currently, almost all GaN components are imported being a sensitive and cutting-edge technology whose export is controlled and restricted by many countries.
- The proposal aims to design, develop and manufacture.
- GaN components for defence in India using completely indigenous GaN technology. This would significantly enhance the indigenous design & development capability, paving way for immense potential in the defence sector including exports.

#### Procurement contract:

- In another development, BEL signed a procurement contract with the iDEX Winner M/s Blurgs Innovations Private Limited for their solution TRIDENT, which is an intelligent maritime domain awareness tool with a robust solution designed to enhance maritime security. This solution assists in building superior maritime domain awareness by relying on anomalous detection and would aid in quicker decision making.
- This is a first procurement order placed by a Defence Public Sector Undertakings (DPSUs) under the iDEX scheme.

#### iDEX framework:

- The iDEX framework was launched by the Prime Minister in 2018 with the objective to provide a platform of co-creation and co-development in the defence sector, engage start-ups and develop defence and aerospace set up in the country.

- The iDEX is being implemented by the Defence Innovation Organisation (DIO), established under the Department of Defence Production.
- Within a short span of time iDEX, which has also been awarded the prestigious Prime Minister Award for Public Policy in Innovation Category for the year 2021, has emerged as a game changer in the defence eco-system through its flagship programmes like DISC, Prime and Open Challenges (OC).
- iDEX has been able to build the required momentum and generate a critical mass of start-ups in the defence sector.
- It has also been able to generate thousands of jobs and attract India's talent back to the country.

## ENVIRONMENT

### LOSS AND DAMAGE FUND APPROVED AT COP 28 SUMMIT



#### Why in news?

- On the opening day of the COP28 climate conference in Dubai, a loss and damage fund to help vulnerable countries cope with the impact of climate change has been officially launched.
- The initial funding is estimated to be \$475 million; host UAE pledged \$100 million, the European Union promised \$275 million, \$17.5 million from the US, and \$10 million from Japan.

#### Background:

- The loss and damage fund was first announced during COP27 in Sharm el-Sheikh, Egypt, in 2022.
- However, it was not until a few weeks before COP 28 that rich and poor countries managed to iron out some of their differences and agree on key points of the fund.

#### What is the loss and damage fund?

- The loss and damage fund is a global financial package to ensure the rescue and rehabilitation of countries facing the cascading effects of climate change.
- The term refers to the compensation that rich nations, whose industrial growth has resulted in global warming and driven the planet into a climate crisis,

must pay to poor nations, whose carbon footprint is low but are facing the brunt of rising sea levels, floods, crippling droughts, and intense cyclones, among others.

- The changing climate has impacted lives, livelihoods, biodiversity, cultural traditions, and identities.

**Loss and damage is often categorised as either economic or non-economic:**

- Economic loss and damage are negative impacts that we can assign a monetary value to. These are things such as the costs of rebuilding infrastructure that has been damaged due to a flood, or the loss of revenue from agricultural crops that were destroyed due to drought.
- Non-economic loss and damage are negative impacts where it is difficult or infeasible to assign a monetary value. These are things such as trauma from experiencing a tropical cyclone, loss of community due to displacement of people, or loss of biodiversity.

**How much damage has been caused by industrialisation?**

- The Industrial Era started in 1850, disrupting Earth's natural mechanism for the production and absorption of greenhouse gases.
- Today, the US, the UK and the EU are considered to be responsible for 50% of all emissions. Bring Russia, Canada, Japan, and Australia into the picture and it jumps to 65%, i.e. two-thirds of all emissions.
- Compared to them, India is responsible for only 3% of historical emissions. Meanwhile China, the world's biggest emitter in the last 15 years, is responsible for 30% of global emissions every year.
- Greenhouse gases comprise methane, nitrous oxide, water vapour, and carbon dioxide (CO<sub>2</sub>) – with CO<sub>2</sub> responsible for most of the global heating.
- Carbon particles are being released in extremely large quantities and they have the ability to linger in Earth's atmosphere seemingly endlessly, at least for a millennium or more, and warm it.

**How much loss and damage is the world facing?**

- Research shows that 55 vulnerable countries have suffered \$ 525 billion combined climate crisis-fuelled losses in the last 20 years. The number is estimated to reach \$ 580 billion per year by 2030.
- Global warming has changed the way the world lives, with vulnerable communities being the worst affected.
- According to the IPCC, losses and damages will increase in future as global warming continues to rise. It will be unequally distributed and impact developing nations the most and, in them, the socially and financially weaker sections.

**How the fund will operate?**

- The World Bank will oversee the loss and damage fund in the beginning, with the source of funds being

rich nations, such as the US, the UK and the EU, as well as some developing countries.

- The scale or the replenishment cycle of the fund remains unclear, but the need of the hour is several trillion dollars.
- Previously, the developing nations were not keen to have the World Bank manage the fund as they saw this as a means by which richer nations could have more control over the finances. They have accepted this term now.

**DROUGHT EMERGENCY DECLARED BY 23 COUNTRIES IN 2022-23**



**Why in news?**

- At least 23 countries, including India, declared drought emergencies at a national or sub-national level during 2022-23, showed new data from a global drought map compiled by the United Nations.
- The report 'Global Drought Snapshot' was launched by the UNCCD at the outset of the 28th Conference of Parties (COP28) to the UN Framework Convention on Climate Change (UNFCCC) climate talks in Dubai.

**Key Highlights:**

- Based on reporting by 101 Parties to the UN Convention to Combat Desertification (UNCCD), 1.84 billion people were drought stricken, out of which 4.7 per cent were exposed to severe or extreme drought.

**European Nations:**

- An emergency was declared in 23 countries due to the impact of drought. Of these, Europe had the highest number (8); Spain, Italy and United Kingdom declaring it in April, May and July 2023, respectively, while Greece, Portugal, Romania and Serbia in July 2022.
- Drought and drought-like conditions spread to many European countries both in 2022 and 2023. The countries faced blistering heat and recorded their hottest summers.
- In 2022, the continent recorded its largest overall drought impacted area; over 630,000 square kilometres,

as opposed to the 167,000 square kilometres annual average between 2000 and 2022.

#### Other countries:

- In recent years, droughts have expanded their territory and intensity. According to the map, United States and Canada also declared drought emergencies in January 2022 and March 2023, respectively.
- In Asia, five countries declared drought – India and Sri Lanka in August 2023, Indonesia in July 2023, Kazakhstan and China in April and May 2022, respectively.
- Simultaneously, South American country Uruguay and the African countries of Niger, Djibouti, Cabo Verde and Mauritania also declared drought emergencies in 2022-23. Other countries included Kiribati, the Marshal Islands, and Tuvalu.
- The Horn of Africa faced its worst drought in 40 years, with Ethiopia, Kenya and Somalia particularly hard hit. Five consecutive failures of rainfall seasons wreaked havoc over large parts of East Africa and contributed to reduced agricultural productivity, food insecurity and high food prices

#### Extreme heat:

- The year 2023 has broken several records when it comes to extreme heat.
- On November 17, 2023, the world breached 2 degrees Celsius of warming, a number the world was constantly warned of not crossing.

#### Impact of drought:

- Droughts have a cascading effect, from dwindling reservoir levels to declining crop yields, from loss of biological diversity to famines and serious economic consequences, especially in agriculture dependent regions where drought-related crop failures lead to food shortages and often skyrocketing prices, potentially disrupting global food supply chains.
- The economic losses associated with the disaster were estimated to be in the billions of dollars annually.

#### Facts:

- UNCCD is one of three Conventions originated at the 1992 Earth Summit in Rio de Janeiro. The other two address climate change (UNFCCC) and biodiversity (UN Convention on Biological Diversity).
- Data revealed that 85 per cent of people affected by droughts live in low-or middle-income countries. Moreover, 98 per cent of the 32.6 million new disaster displacements in 2022 were the result of weather-related hazards such as storms, floods and droughts.
- The report was launched at a high-level event in Dubai with the International Drought Resilience Alliance, a collaborative platform, launched at the UNFCCC COP27 in 2022, led by the governments of Senegal and Spain.

## INDIA REFRAINS FROM SIGNING COP28 HEALTH AND CLIMATE DECLARATION



#### Why in news?

- India refrained from signing the COP28 Declaration on Climate and Health, curbing greenhouse gas use for cooling in the health sector, is one of the points in the document, which may not be practical or achievable within the country's healthcare infrastructure in the short term.

#### Key Highlights:

- On the occasion of the first Health Day at the 28th UN Climate Change Conference (COP28), the declaration expressed grave concern about the negative impacts of climate change on health.
- The declaration is signed by 124 countries till now with the US and India, which are among the top greenhouse gas emitters, absent from the list of signatories.
- The declaration calls for climate action to achieve benefits for health from deep, rapid, and sustained reductions in greenhouse gas emissions, including from just transitions, lower air pollution, active mobility, and shifts to sustainable healthy diets.

#### Why India refrained?

- The declaration, aimed at addressing the critical intersection between climate change and global health, emphasises the need for swift and substantial reductions in greenhouse gas emissions.
- However, a sticking point emerged as the draft outlined a commitment to reducing greenhouse gases for cooling applications within healthcare infrastructure a measure India finds difficult to comply with.
- India had put emphasis on resilient health in its G20 declaration.
- The three health priorities of India's G20 presidency were building a resilient healthcare system, creating a platform for improving access to medical countermeasures and creating a platform for sharing digital goods between countries.
- The COP28 Declaration underscores the importance of addressing the broad spectrum of impacts that climate change has on health.

- This includes considerations for mental health and psychosocial well-being, preservation of traditional medicinal knowledge, protection of livelihoods and cultures, and dealing with climate-induced displacement and migration.

**Holistic approach:**

- The declaration aims at promoting a holistic approach to understanding and mitigating the diverse health challenges posed by a changing climate.
- One of the central objectives of the declaration is the commitment to combat inequalities within and among countries.
- It emphasised the pursuit of policies that accelerate the achievement of the Sustainable Development Goals (SDGs), particularly SDG3, which focuses on good health and well-being.
- The comprehensive approach seeks to reduce poverty and hunger, improve health and livelihoods, strengthen social protection systems, enhance food security and nutrition, and ensure access to clean energy, safe drinking water, sanitation, and hygiene for all.
- Acknowledging the carbon footprint of health systems, the declaration encourages steps to curb emissions and reduce waste in the health sector.
- This includes assessing greenhouse gas emissions of health systems, developing action plans, establishing nationally determined decarbonisation targets, and implementing procurement standards for national health systems, including supply chains.
- The objective is to promote sustainable practices within the health sector to contribute to broader climate goals.

**Concerns:**

- As one of the leading global emitters worldwide, and the home of 1 billion of the world's population, the absence of India from the list of over 120 countries endorsing the COP28 health declaration is striking.

**GLACIERS SHRANK 1 M A YEAR IN A DECADE: WMO**



**Why in news?**

- Recently, the World Meteorological Organisation released a report titled, 'The Global Climate 2011-2020: A Decade of Acceleration'.

**Details:**

- It said the 2011-2020 decade, though warmest ever recorded in history, saw the lowest number of deaths from extreme events.
- It attributed this to an improvement in the "early warning system" driven by improvements in forecasting and better disaster management.
- In India, for instance, improvements in forecasting cyclone formation and the time it took to reach land have led to greater preparedness and evacuation of those most at risk.

**Key Highlights:**

- The 2011-2020 decade was the first since 1950 when there was not a single short-term event with 10,000 deaths or more.
- The report also says that this was the first decade that the depleted ozone hole visibly showed recovery. Glaciers that were measured around the world thinned by approximately 1 metre per year on an average between 2011 and 2020.
- Greenland and Antarctica lost 38% more ice during the period than during the 2001-2010 period.
- The report also had a mention of the 2021 Uttarakhand rock-avalanche that was triggered from a breach in the Nanda Devi glacier in the Himalayas.

**Heatwaves:**

- The report further underlined that human-caused climate change significantly increased the risks from extreme heat events.
- Heatwaves were responsible for the highest number of human casualties, while tropical cyclones caused the most economic damage.

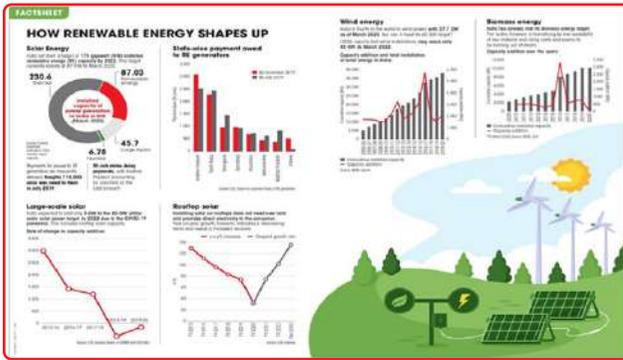
**Climate financing:**

- Public and private climate finance almost doubled during the period.
- However, it needed to increase at least seven times by the end of this decade to achieve climate objectives, including keeping global temperature from rising by more than 1.5 degrees Celsius by the end of the century.

**MAJOR ONGOING RENEWABLE ENERGY SCHEMES AND PROGRAMMES**

**Why in news?**

- The Union Minister for New & Renewable Energy and Power has informed that the Government has set a target of achieving 500 GW of installed capacity from non-fossil fuels by 2030, in line with the Prime Minister's announcement at COP-26.
- Efforts have been made by the Government to increase awareness about the use of renewable energy through introduction of various schemes and publicity through print and media.



### Ongoing major Renewable Energy Schemes / Programmes:

- Scheme for Development of Solar Parks and Ultra-mega Solar Power Projects with a target of setting up 40,000 MW capacity. Under the scheme, the infrastructure such as land, roads, power evacuation system water facilities are developed with all statutory clearances/approvals. Thus, the scheme helps expeditious development of utility-scale solar projects in the country.
- Central Public Sector Undertaking (CPSU) Scheme Phase-II (Government Producer Scheme) for setting up grid-connected Solar Photovoltaic (PV) Power Projects by Government Producers, using domestically manufactured solar PV cells and modules, with Viability Gap Funding (VGF) support, for self-use or use by Government/ Government entities, either directly or through Distribution Companies (DISCOMS).
- Production Linked Incentive scheme 'National Programme on High Efficiency Solar PV Modules' for achieving manufacturing capacity of Giga Watt (GW) scale in High Efficiency Solar PV modules (Tranche- I & II).
- PM-KUSUM Scheme to promote small Grid Connected Solar Energy Power Plants, stand-alone solar powered agricultural pumps and solarisation of existing grid connected agricultural pumps. The scheme is not only beneficial to the farmers but also States and DISCOMS. States will save on subsidy being provided for electricity to agriculture consumers and DISCOMS get cheaper solar power at tail end saving transmission and distribution losses.
- Rooftop Solar Programme Phase II for grid connected solar rooftop power plants. Under this Programme, subsidy is provided for residential sector and performance linked incentives to DISCOMS for achieving capacity addition in rooftop solar above baseline.
- Green Energy Corridors (GEC): to create intra-state transmission system for renewable energy projects. Central Financial Assistance (CFA) is provided to set up transmission infrastructure for evacuation of Power from Renewable Energy projects in total ten States (considering both the phases of GEC).

- a) Intra-State Transmission System Green Energy Corridor Phase-I
- b) Intra-State Transmission System Green Energy Corridor Phase-II
- Bio-Energy Programme:
  - a) Waste to Energy Programme: Programme on Energy from Urban, industrial and Agricultural Wastes/Residues
  - b) Biomass Programme: Scheme to Support Manufacturing of Briquettes & Pellets and Promotion of Biomass (non-bagasse) based cogeneration in Industries.
  - c) Biogas Programme: for promotion of family type Biogas plants
- Renewable Energy Research and Technology Development (RE-RTD) Programme (Support Programme).
- Human Resource Development Scheme with components such as short term trainings & skill development programmes, fellowships, internships, support to lab upgradation for RE and renewable energy chair.
- National Green Hydrogen Mission launched with an outlay of Rs. 19,744 crore with aim to make India a Global Hub for production, utilization and export of Green Hydrogen and its derivatives.

### WORLD BANK LAUNCHES COMPREHENSIVE PROGRAMME TO COMBAT AIR POLLUTION CRISIS IN INDIA



#### Why in news?

- In response to India's escalating air pollution crisis, affecting the entire population of 1.4 billion, the World Bank has launched a multifaceted program aimed at curbing the devastating impact of ambient particulate matter (PM)<sub>2.5</sub> pollution.
- It includes the introduction of airshed management tools, the development of State-wide Air Quality Action Plans, and the creation of the first extensive Regional Airshed Action Plan for the Indo-Gangetic Plains (IGP), encompassing seven union territories and states.

### PM 2.5 emissions in India:

- Recent data reveals that every individual in India is exposed to unhealthy levels of PM2.5, a particularly hazardous airborne pollutant.
- PM2.5, particles with a diameter of less than 2.5 microns, pose severe health risks, leading to ailments such as lung cancer, stroke, and heart disease. In 2019 alone, air pollution was responsible for 1.67 million deaths in India, constituting 17.8 per cent of the total mortality rate.
- The economic toll was equally significant, with losses of USD 36.8 billion, equivalent to 1.36 per cent of India's Gross Domestic Product (GDP), attributed to premature deaths and morbidity caused by air pollution.
- PM2.5 emissions in India arise from diverse sources, including the combustion of fossil fuels, biomass burning, and windblown dust from construction sites and industrial plants.
- Alarmingly, over half of these emissions are formed in a "secondary" manner in the upper atmosphere, where various gaseous pollutants from different areas mix, contributing to the widespread and cross-border impact of air pollution.

### Airshed approach:

- Recognizing the multi-sectoral and multi-jurisdictional nature of India's air pollution challenge, the World Bank advocates for an "airshed" approach.
- An airshed, defined as a region with a common flow of air, extends beyond city boundaries, emphasizing the need for coordinated efforts at the sub-national level.

### Initiatives by India:

- India has undertaken significant steps to address air pollution, revising ambient air quality standards, strengthening emission standards for vehicles and industries, and promoting renewable energy and electric vehicles.
- The National Clean Air Programme (NCAP), a pivotal government initiative, sets a time-bound goal to improve air quality across the country, with a particular focus on around 132 "non-attainment" cities where pollution standards are not met.
- The government's commitment is underscored by the allocation of approximately USD 1.7 billion, based on the 15th Finance Commission's recommendations, to combat air pollution in 42 cities with million-plus populations.
- This innovative performance-based fiscal transfer funding program is the world's first for air quality management in cities, requiring a 15 per cent annual reduction in pollution levels.

### Country Partnership Framework:

- The World Bank's involvement in India's Air Quality Management (AQM) is part of a phased strategy outlined in its Country Partnership Framework.

- Leveraging insights from similar projects in Mexico and China, the World Bank focuses on the densely populated Indo-Gangetic Plain, where pollution intensity is high, and the capacity to address the challenge requires significant support.
- The AQM initiative introduces tools for airshed management, facilitates the creation of State Air Quality Action Plans, and develops the first extensive Regional Airshed Action Plan for the IGP.
- Collaborative efforts with academic institutions and practitioners involve modelling to enhance air quality management in the region.
- Air quality management is recognized as an ongoing process that necessitates integration into government capabilities, business practices, and individual behaviour.

### Recommendations:

- The World Bank emphasizes the importance of airshed-wide coordination, acknowledging that substantial pollution reductions cannot be achieved by addressing local emissions alone.
- India's convergence with climate change initiatives, such as the solar-energy revolution, presents an opportunity for co-benefits.
- A study by the World Bank and the International Institute for Applied Systems Analysis (IIASA) suggests that focusing on air pollution could significantly reduce India's CO2 emissions, contributing to climate change mitigation.

### Way Forward:

- In conclusion, the comprehensive approach by the World Bank aligns with India's commitment to cleaner air, sustainable development, and the well-being of its citizens.
- With collaborative efforts and innovative strategies, the endeavour seeks to create a paradigm shift in India's fight against air pollution.

## DRDO HALTS MISSILE TESTING TO SAFEGUARD OLIVE RIDLEY TURTLE NESTING



### Why in news?

- In a bid to protect Olive Ridley sea turtles during their mass nesting season from January to March 2024,

India's Defence Research Development Organisation (DRDO) will temporarily halt missile testing at Wheeler Island off the Odisha coast.

### Key Highlights:

- The decision aims to minimize disturbances caused by flashes of light and loud sounds during missile testing, which can distract the turtles.
- The nesting site's proximity to Wheeler Island prompted the move, as the endangered turtles face threats from hunting, with their eggs and shells used for various purposes.
- The decision comes as part of a broader strategy, including patrolling by the Army and Coast Guard to prevent trawlers and fishing boats from approaching areas where the turtles lay their eggs.
- To enhance coordination, DRDO will nominate a nodal officer, ensuring collaborative efforts with the forest department for the Olive Ridleys' safety.

### Background:

- Around five lakh Olive Ridleys nested in the area in 2023, emphasizing the significance of conservation efforts.
- The committee, led by Chief Secretary P K Jena, stressed the need for advisories to coastal organizations, institutions, and industrial houses to adhere to outdoor lighting regulations.
- Furthermore, the Odisha government has already prohibited fishing along the coast near the Rushikulya rookery in Ganjam district from November 1 to May 31.
- The wildlife division has urged the director of the Integrated Testing Range (ITR) at Chandipur to allocate space outside Wheeler Island's periphery for seasonal forest camps, facilitating joint sea patrolling by marine police and the forest department.

### About Olive Ridleys:

- The Olive ridley turtles are the smallest and most abundant of all sea turtles found in the world.
- These turtles are carnivores and get their name from their olive-coloured carapace.
- They are best known for their unique mass nesting called Arribada, where thousands of females come together on the same beach to lay eggs.
- They are found in warm waters of the Pacific, Atlantic and Indian oceans.
- The Odisha's Gahirmatha Marine Sanctuary is known as the world's largest rookery (colony of breeding animals) of sea turtles.

### Way Forward:

- The comprehensive measures underscore the commitment to protecting these vulnerable sea turtles during their critical nesting season.

## LESS THAN 8 PERCENT OF INDIA COAL POWER PLANTS CAN CONTROL SO<sub>2</sub> EMISSIONS, A NEW ANALYSIS FINDS



### Why in news?

- Less than eight per cent of India's coal-based power plants have installed the technology recommended by the Union Ministry of Environment, Forest and Climate Change (MoEF&CC) to keep sulphur dioxide (SO<sub>2</sub>) emissions in check, an analysis by the Centre for Research on Energy and Clean Air (CREA) has found.

### Details:

- Flue Gas Desulfurisation (FGD) units are used to remove sulphur compounds from the exhaust emissions of power plants. India is the largest emitter of SO<sub>2</sub> in the world.
- In fact, across India, only a combined capacity of 16.5 Gigawatts (GW) of coal plants have installed FGDs and Circulating Fluidised Bed Combustion (CFBC) boilers equivalent to 5.9 GW.
- The CREA analysis found that 92 per cent of the country's coal power plants function without FGDs. Since December 2022, only 3.2 GW capacity has installed SO<sub>2</sub> control technologies.

### Background:

- Eight years ago, the MoEF&CC introduced emission standards in 2015 for regulating SO<sub>2</sub>, NO<sub>x</sub> (nitrogen oxides), and Hg (mercury) emissions. The deadline has been extended four times for units in Delhi and the National Capital Region (NCR) and three times for most other units across the country.

### Categories of coal-power plants:

- In 2021, the MoEF&CC divided the categories of coal-power plants based on geography to enforce deadlines.
- Category A is demarcated to coal-based power plants within a 10-kilometre radius of the NCR and of cities with a million-plus population.
- Category B is within a 10 km radius of critically polluted areas or non-attainment cities, and Category C is the remaining plants throughout the country.

- The majority of the country's power plants belong to Category C, with the longest deadlines. The deadlines for plants within the city are shorter due to high pollution levels that could harm people.
- As of October 2023, for power plant units in the 300 km radius of Delhi-NCR, FGD installations have been completed for 2.6 GW installed capacity of the cumulative capacity of 13.4 GW. Bids have been issued for 3.4 GW capacity.

### What of NTPC?

- Of the National Thermal Power Corporation (NTPC)'s total 56.3 GW coal capacity monitored by the Central Electricity Authority (CEA) for FGD installation, only 3.6 GW has been installed with FGDs as of October 2023.
- The NTPC, CEA and Central Pollution Control Board have stipulated a timeline of 18-36 months for installation and synchronisation of FGDs from the bid-award date.
- For the whole country, by December 2020, 66.5 GW capacity had already been awarded the bids, but most of this capacity had been not commissioned for FGD installation.
- Even after installing and operationalising the FGD instrument, Delhi's Dadri thermal power plant SO<sub>2</sub> emissions are on the higher side. It means the FGD is not technically compatible with the plant's capacity or is not running continuously alongside the plant, Aggarwal said.
- Despite having a mandatory feasibility test before installation, there is the possibility of challenges with efficiency.

### Installed capacity:

- India's energy generation installed capacity stands at 425 GW. The thermal sector holds a predominant position within the overall installed capacity, encompassing coal (48.6 per cent), gas (5.9 per cent), lignite (1.6 per cent), and a minimal share (<0.2 per cent) from diesel, according to the 2023 CEA report.

## ADB LAUNCHES CLIMATE ACTION CATALYST FUND TO DRIVE DECARBONISATION IN ASIA PACIFIC



### Why in news?

- The Asian Development Bank (ADB) has unveiled plans to commence operations of its Climate Action Catalyst Fund (CACF) on January 1, 2024.

### Details:

- Positioned as a trailblazing carbon fund under the Paris Agreement, the CACF aims to mobilize innovative carbon finance through the acquisition of carbon credits, intending to spur investments in transformative mitigation actions across ADB's developing member countries (DMCs).
- In a significant departure from conventional carbon market practices, the CACF will provide upfront finance for high-impact climate mitigation actions, ensuring future delivery of carbon credits through long-term transactions.
- This is a notable shift from the customary approach of payments upon delivery, which often entails extended timelines, delaying benefits to project owners.

### Cooperative approaches:

- Under Article 6 of the Paris Agreement, the CACF enables cooperative approaches among nations, facilitating direct collaboration between countries.
- This mechanism allows the transfer of carbon emissions reductions achieved through climate mitigation measures in one country to count towards the nationally determined contributions (NDCs) of another.
- The Swedish Energy Agency has committed to contributing 300 million Swedish krona (approximately USD 27 million) to the fund, aiming to mobilize over USD 100 million in commitments from national and subnational government entities, as well as the private sector within ADB member countries.

### Assisting DMCs:

- The CACF prioritizes high-quality climate mitigation actions and environmental integrity, seeking to disseminate advanced low-carbon technologies and deliver sustainable development impacts for local communities in Asia and the Pacific.
- The fund's overarching goal is to assist ADB DMCs in achieving and progressively elevating the targets outlined in their NDCs.
- By engaging financing partners, the CACF provides a mechanism to meet compliance requirements and fulfil various purposes by purchasing carbon credits from a diverse portfolio of projects, programs, and scaled-up activities supported by ADB.

### Significance:

- The launch of the CACF solidifies ADB's role as an early mover in operationalizing international carbon markets under Article 6.
- The initial tranche of Article 6 transactions under the fund is poised to set examples for new stakeholders interested in participating in Article 6.

➤ Additionally, the fund will offer a crucial price signal while contributing to the evolution of new international carbon markets under the Paris Agreement.

### Way Forward:

➤ As the climate bank for Asia and the Pacific, ADB's carbon markets initiatives align with its broader efforts to bolster climate action and advocate for green growth in the region.

## TRIPLING RENEWABLE ENERGY TARGET



### Why in news?

➤ Recently, 118 countries signed a renewable energy pledge at the ongoing COP28 climate summit to triple the world's green energy capacity to 11,000 GW by 2030, thereby, reducing the reliance on fossil fuels in generating energy.

### Renewable energy pledge:

- According to the "Global Renewables and Energy Efficiency Pledge", countries have to "double the global average annual rate of energy efficiency improvements from around 2% to over 4% every year until 2030".
- By checking the rise in emissions, governments hope to curtail global average temperature below the 2 degree Celsius temperature limit since pre-industrial times, if not the ambitious 1.5 degree Celsius of the 2015 Paris Agreement.
- The pledge is neither legally binding nor a part of the official COP28 calendar. COP28 also has the issue of tripling renewable energy on its agenda, the outcome of which is being keenly awaited. What the pledge does is indicate that world leaders want to be more active in checking global emissions.
- Incidentally, the International Energy Agency (IEA) has found that, between 2022 and 2027, renewables will account for over 90% of global electricity capacity expansion.

### Why tripling of renewable energy?

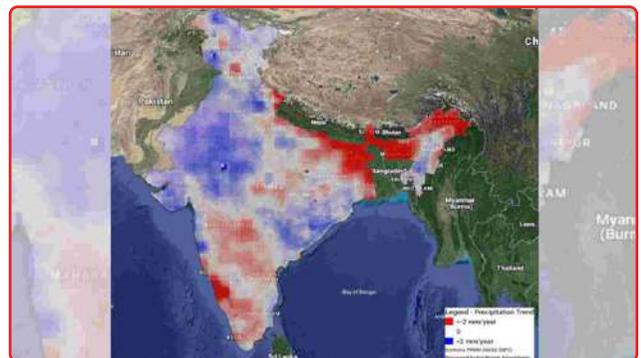
➤ Solar, wind, hydropower and biofuels are seen as the fuels of the future, even in developing countries. According to the pledge, the tripling of renewable energy is expected to practically eliminate fossil fuels as energy sources by 2050.

- In 2022, India's Ministry of New and Renewable Energy said that the country was the world's third-largest producer of renewable energy, with 40% of its installed energy capacity coming from non-fossil fuel sources. India has announced its aim to meet 50% of its electricity demands from renewable energy sources by 2030 and reach net zero emissions by 2070.
- The IEA has found that the electricity sector is the brightest spot globally for renewables, with the strong growth of solar photovoltaics and wind energy in recent years, building on the already significant contribution of hydropower.
- Across the globe, the deployment of renewables is also running into trouble due to rising costs, labour constraints, and supply chain issues. These have forced project delays and cancellations in recent months, costing leading developers billions of dollars in write-offs.

### India's stand:

- The pledge was spearheaded by the EU, the US and the UAE and supported by Brazil, Nigeria, Australia, Japan, Canada, Chile and Barbados.
- India and China have stayed away as the initiative calls for phasing down of coal and "ending the continued investment in unabated new coal-fired power plants".
- In September 2023, however, India had already supported, as part of the G20, a commitment to work towards tripling global renewable energy capacity by 2030.
- The announcement was one of the strongest declarations to come out of the G20. All eyes are now on the result of discussions at COP28.

## INDIA EXTREME RAINFALL CORRIDOR



### Context:

- The Indian monsoon has well-known features, such as the onset of the monsoon, the withdrawal, the active and break periods, and the low-pressure systems (or monsoon depressions).
- Every aspect of the monsoon has been affected by global warming.

**Details:**

- The total seasonal rainfall has also trended downwards for more than seven decades, due to the differential heating of the land versus the ocean due to global warming.
- However, this trend has been distributed unevenly through the monsoon season, as manifest in the longer duration but lower intensity of dry spells and the greater intensity of wet spells.
- While the India Meteorological Department (IMD) has made progress in forecasting extremes, multiple factors can combine to still produce devastating heavy rain events that remain hard to anticipate.

**Where does extreme rain occur?**

- India's monsoon forecasts rely heavily on its relation to the El Niño and the La Niña phenomena, although this relation holds only about 60% of the time.
- Researchers are also continuing to search for additional process understanding, especially for high-impact extreme rainfall events.
- A new study has found that despite all these seemingly disparate changes in different aspects of the monsoon dynamics, a remarkable stationary element exists in terms of where the synchronised extreme rainfall events occur.
- The so-called large-scale extreme rainfall events are actually simultaneous or near-simultaneous heavy rain episodes that are strewn across a 'highway' that extends from parts of West Bengal and Odisha to parts of Gujarat and Rajasthan.
- The most remarkable new finding is that this corridor has remained unchanged from 1901 to 2019.
- In the seemingly chaotic change in all aspects of the monsoon, such a trapping of the extreme events to a relatively narrow corridor is good news for potential improvements in process understanding, which is bound to lead to better predictions of these synchronised extreme rainfall events.

**What does this mean for the monsoon's stability?**

- Traditional statistical methods tend to miss the complex relations between multiple nodes of rainfall centres.
- Rainfall data from the IMD at a 25-km scale in latitude and longitude offers a rich field over which sophisticated network analysis can be applied to extract the nodes that have highest synchronicity in rainfall with other nodes near and far.
- This analysis found that the most active nodes have followed this 'highway' for more than a century. The link lengths between nodes, or the scales of synchronicity, have remained nearly constant, at an average value of about 200 km.

**Popcorn and kettle analogy:**

- Central India is the kettle that warms up from the pre-monsoon into the monsoon. The monsoon rainfall

systems are like kernels of corn popping randomly across the kettle.

- But it turns out that the kernels are popping in a synchronous dance, in an indication that large groups of popcorn are jumping up at the same time.
- An analysis of winds and other circulation features indicate that the monsoon domain has been unique in remaining fairly stable for the formation of these extremes despite the various kicks from all tropical oceans and from pole-to-pole.

**What do the findings mean for forecasts?**

- Some researchers have said that stationary elements no longer exist in climate systems because of global warming. Yet the Indian monsoon continues to produce surprises in the way it is able to synchronise heavy rain events as well as stick to the 'highway' for such a long time.
- This is also the corridor for the monsoon depressions, which themselves have shown an increase at the 3- to 10-day timescales while decreasing at lower frequencies of 10-60 days. These changes are manifest in the active and break periods.
- The main candidate for the geographic trapping of synchronised extreme rainfall is likely to be the range of mountains running along the west coast and across Central India.
- This hypothesis needs to be tested in models, but its implications for improving forecasts of such events is undeniable.
- The finding also suggests that, in order to improve forecasts, increasing the model resolution and the computational cost may not be necessary. Instead, the focus can be on the dynamics of synchronisation.
- The potential for reducing risk at the smaller scale from these large-scale extreme rainfall events, for agriculture, water, energy, transportation, health, etc., is also alluring.
- Fortunately, India is in a solid position vis-à-vis its modelling capacity and computational resources to fully exploit this potential.

**THE LIMITATIONS OF CCS AND CDR AND THEIR GRIP ON FUTURE CLIMATE**



### Why in news?

- At the COP28 climate talks, draft decisions thus far have referred to the abatement and removal of carbon emissions using carbon capture and storage (CCS) and carbon-dioxide removal (CDR) technologies.
- Considering the meaning of the word 'abatement' has become an important bone of contention, understanding the meaning and limitations of CCS is important – as also those of CDR.

### What are CCS and CDR?

- CCS refers to technologies that can capture carbon dioxide (CO<sub>2</sub>) at a source of emissions before it is released into the atmosphere.
- These sources include the fossil fuel industry (where coal, oil and gas are combusted to generate power) and industrial processes like steel and cement production.
- CDR takes the forms of both natural means like afforestation or reforestation and technologies like direct air capture, where machines mimic trees by absorbing CO<sub>2</sub> from their surroundings and storing it underground.
- There are also more complex CDR technologies like enhanced rock weathering, where rocks are broken down chemically; the resulting rock particles can remove CO<sub>2</sub> from the atmosphere.
- Other technologies like bioenergy with carbon capture and storage (BECCS) capture and store CO<sub>2</sub> from burning biomass, like wood.
- At COP28, the term "unabated fossil fuels" has come to mean the combustion of these fuels without using CCS technologies to capture their emissions.
- Draft decision texts point to a need to "phase out" such unabated fossil fuels. On the other hand, removal technologies have been referenced in the context of the need to scale zero and low-emission technologies and support forest restoration as a means to promote emission removals.

### How much CCS and CDR?

- While their technical details are clear, scientists have questions about the scale at which CCS and CDR are expected to succeed.
- The Sixth Assessment Report (AR6), prepared by the United Nations Intergovernmental Panel on Climate Change (IPCC), deals with climate mitigation.
- It relies a lot on the use of CDR for its projections related to the world achieving the goal of limiting the world's average surface temperature increase to 1.5 degrees C with no or limited overshoot. (Overshoot means the temperature limit is temporarily exceeded.)
- The emission scenarios that the IPCC has assessed that have more than a 50% chance of limiting warming to 1.5 degrees C (with no or limited overshoot) assume the world can sequester 5 billion tonnes of CO<sub>2</sub> by 2040. This is more than India emits currently every year.

- There is no pathway to 1.5 degrees C in AR6 that doesn't use CDR.

### How well does CCS work?

- The IPCC AR6 report states CDR ought to be used "to counterbalance hard-to-abate residual emissions." The reason is that available CDR is to be used strategically to compensate hard to abate residual emissions, not to maintain a high level of fossil fuel use.
- For CCS, too, the term "abated fossil fuels" should be used only in the context of highly effective CCS applications, with a capture rate of 90-95% or more, the captured emissions being stored permanently, and methane emissions leakage from upstream oil and gas production processes being kept under 0.5% (approaching 0.2%).
- But in the real world, natural CDR has been tacked on to existing emissions. For example, the 2023 'Land Gap' report estimated that various governments have proposed to remove CO<sub>2</sub> using around one billion hectares of land.
- Based on this, the report reflected that some pledges over-rely on land-based CDR to offset fossil fuel emissions. This raises serious concerns that these countries are shifting their mitigation burden away from reducing fossil fuel use.

### How well does CDR work?

- CDR methods like afforestation, reforestation, BECCS, and direct air capture are constrained by their need for land.
- Land also invokes equity concerns. Land in the Global South is often considered to be 'viable' and/or 'cost-effective' for planting trees and deploying other large-scale CDR methods.
- As a result, such CDR projects can adversely affect land rights of indigenous communities and biodiversity and compete with other forms of land-use, like agriculture that is crucial for ensuring food security.
- This is of particular concern vis-à-vis technological CDR at scale.

### Pitfalls of CCS and CDR

- By removing CO<sub>2</sub> from their environs, there are concerns that CCS and CDR create more 'room' to emit the greenhouse gas. (In some cases, CCS has also been used to inject captured CO<sub>2</sub> into oil fields to extract more oil.)
- In future emissions scenarios that the IPCC has assessed, the world's use of coal, oil, and gas in 2050 needs to decline by about 95%, 60%, and 45% respectively (all median values) from their use in 2019 to keep the planet from warming by less than 1.5 degrees C with no or limited overshoot.
- But without CCS, the expected reductions are 100%, 60%, and 70% for coal, oil, and gas by 2050.

## A QUARTER OF FRESHWATER FISH SPECIES RISK EXTINCTION BY CLIMATE CHANGE, IUCN



### Why in news?

- About a quarter of the world's freshwater fish species are at risk of extinction by climate change, a new International Union for Conservation of Nature (IUCN) Red List assessment revealed.
- Out of the 14,898 species assessed, 3,086 are at risk of extinction.

### Threats:

- At least 17 per cent of the threatened freshwater fish species are affected due to decreasing water levels, shifting seasons and rising sea levels pushing the seawater up the rivers, influenced by climate change.
- The climatic change risks to fish compound threats from pollution that affects 57 per cent of the freshwater fish species, dams and water extraction that impact 45 per cent and overfishing that hurts 25 per cent, respectively.
- Disease and invasive species harm 33 per cent.

### Atlantic salmon:

- New evidence received by researchers showed that the global population of Atlantic salmon (*Salmo salar*) dropped by 23 per cent between 2006 and 2020, pushing the species from the least concern category to near threatened.
- Atlantic salmon are now limited to a small portion of rivers across northern Europe and North America that were inhabited centuries ago.
- The population was reduced by multiple threats experienced during long-course migration between freshwater and marine habitats.

### Impact of climate change:

- Climate change has affected the entire life cycles of the species, influencing its development at a young age, reducing prey availability and restrictions due to invasive alien species.
- For example, the Pacific pink salmon has expanded its range towards northern Europe, among others. Further, anthropogenic disturbances such as dams and other barriers prevented access to spawning and feeding bases.

- Water pollution and sedimentation, mainly from logging and agriculture, caused higher deaths among young salmon. The assessment also noted concerns and threats to farmed salmon and their lack of adaptability to climate change.

### Green Turtle:

- The Red List assessment also revealed that the Central South Pacific and East Pacific green turtle (*Chelonia mydas*) populations in the areas have moved from the categories of endangered and vulnerable to extinction.
- The green turtles face threats from high temperatures that result in poor hatching success and increasing sea levels that threaten to flood their nests and drowning the young.
- The warming ocean temperatures and changes in currents due to climate change also affect the growth of seagrasses that the species consume, making them susceptible.

### Big leaf mahogany:

- The big leaf mahogany (*Swietenia macrophylla*) is another example, which is one of the world's most commercially popular timber trees and moved from vulnerable to endangered on the Red List.
- New information received by the researchers revealed that the number of big leaf mahogany has reduced by 60 per cent over the past 180 years across Central and South America.
- It is the most sought-after timber across the United States, China, and Western Europe for producing veneers, musical instruments, decorative and ornamental features and high-quality furniture.
- The drop in numbers has been attributed to unsustainable practices used to harvest the valuable timber from the wild and urban encroachment in tropical areas along with agriculture.
- Illegal logging and trade continue to be a threat to the species, despite having protection under national and international laws. Further, climate change threatens the habitat of the big leaf mahogany too.

### Way Forward:

- It is imperative to safeguard our freshwater systems as they remain the sole home for precious, irreplaceable wildlife while offering humans with many services, he urged.

## IS THE WORLD CLOSER TO PHASING OUT FOSSIL FUEL?

### Why in news?

- The 28th edition of the Conference of Parties (COP) concluded in Dubai recently with 198 signatory countries agreeing that the world must "transition" away from fossil fuels in a "just, orderly and equitable manner" to achieve net zero by 2050.



### Does the wording of the agreement suggest that the end of fossil fuels is near?

- The Dubai Consensus is significant only because this is the first time since 1995, when the first ever COP was held in Berlin, that there is a formal acknowledgement that emissions from fossil fuels are the main culprit driving global warming. So far, all agreements have only spoken of the need to stem “greenhouse gas emissions.”
- This is despite it being common knowledge that three-fourth of such emissions and 90% of carbon dioxide are the result of burning coal, oil and gas.
- It was only in the 26th edition of the COP, in Glasgow in 2021 that countries agreed to tackle coal by agreeing to “phase down” its use. It’s important to keep in mind here that “phase down” and “phase out” have no meaning on their own because they do not refer to any specific year by which the use of these fuels must terminate.
- Large, developing countries like India and China, have protested against the singling out of coal among fossil fuels, on the grounds that they need them for lifting their masses out of poverty and providing energy security.
- India, while rich in coal reserves, is still an importer of the product and has limited oil and gas reserves. China is rich in both coal and gas.
- The United States, that derives about a fifth of its energy from coal, has usually been supportive of calls to phase out coal but being heavily dependent on oil and gas reserves, has never voiced any call to action to eliminate the latter two.
- However, now that all fossil fuels have been included in the Dubai Consensus, it brings parity among fuels and acknowledgement that they all need to be done away with for the world to have a chance at preventing global, average temperatures from rising 1.5 degree Celsius over pre-industrial levels.
- But because there are no timelines yet, fossil fuels are going to be the mainstay of economies everywhere in the years to come.

### Can fossil fuels be immediately replaced?

- Nearly two centuries of industrialisation has meant that there is a well-oiled infrastructure system to

extract, process and distribute coal, oil and gas to all kinds of power plants and convert them to electricity and combustible products, ranging from petrol and diesel to plastic.

- Then there is the infrastructure, transmission grids and pipelines to channel these stores of energy to houses and vehicles.
- Unfortunately, power from natural sources of power such as solar and wind are not as easily available, on demand, as fossil fuel: the sun because of its unavailability at night and wind due to the temperamental nature of the ocean and atmosphere.
- The infrastructure to store all of the energy produced this way is grossly inadequate. India’s National Electricity Plan, 2022-27, plans to add nearly 87,000 MW in this period in the form of fresh coal-fired capacity: 27,000 MW via under-construction power plants and 60,000 MW from new plants.
- Oil production in the U.S. hit record levels in 2023. Since 2010, the number of oil barrels per day has tripled and gas production has risen two and half times in the country.

### Transition fuels:

- The Dubai Consensus agreement stating that a transition from fossil fuel, while necessary, suggests that “transition fuels” could play a role in “facilitating the energy transition while ensuring energy security.”
- Though there is no definition of what these fuels are, natural gas has been touted as one of the contenders.
- Even though natural gas production leads to methane emissions, estimates by the International Energy Agency proffer that in balance, switching from coal-to-gas reduces emissions by 50% when producing electricity and by 33% when providing heat.
- This of course invites criticism that such a framing of natural gas advantages countries which have natural production and distribution capabilities for this gas.

### What does the Dubai Consensus say about methane?

- Methane is a potent greenhouse gas and has several times more heat-trapping capabilities compared to carbon dioxide. It is a key component of natural gas and responsible for about a third of planetary warming just behind carbon dioxide.
- Accelerating and substantially reducing non-carbon-dioxide emissions globally, including in particular methane emissions by 2030 is necessary for humanity to have a shot at keeping average temperatures from rising beyond 1.5 degree Celsius by the end of the century, the agreement notes.
- The Global Methane Pledge to cut methane emissions 30% of 2020 levels by 2030 was signed on by nearly 150 countries at the COP-27 summit in Egypt. China and the U.S. have also agreed to address industrial methane emissions that result from natural gas production.

- ⇒ India has resisted pressure to cut methane emissions on the grounds that most of its methane results from the agricultural sector. However, it has unveiled plans to make its energy production processes more efficient to reduce its release.

### WHAT DOES COP-28 MEAN FOR CITIES?



#### Why in news?

- ⇒ The 28th Conference of Parties (COP-28) in Dubai has been described by some as being a mixed bag.
- ⇒ A few ambitious delegates described it as the "beginning of the end of an era of fossil fuels". This was an important COP owing to the Global Stock Taking (GST) over the Paris climate deals of keeping global temperatures below 1.5 degree Celsius and reducing greenhouse gas (GHG) emissions.
- ⇒ Likewise, the Loss and Damage Fund was also cleared. The focus was therefore, on both mitigation and adaptation strategies.

#### What was discussed about cities?

- ⇒ When the United Nations Framework Convention on Climate Change (UNFCCC) initiated the COP in 1995, 44% of people lived in cities. Currently, 55% of the global population is urban and this is expected to reach 68% by 2050.
- ⇒ The urban world today consumes nearly 75% of primary energy and is responsible for roughly 70% of CO<sub>2</sub> (76% of total GHG) emissions. Hence, the desired results of the Paris commitments are not possible without addressing urban issues.
- ⇒ At 2023 COP, there was a special day dedicated to a ministerial meeting on urbanisation and climate change. This meeting convened Ministers of housing, urban development, environment finance, and other portfolios; local and regional leaders, financial institutions, non-government organisations; and other stakeholders.
- ⇒ Such moves forced some of the city representatives and Civil Society Organisations (CSOs), to raise their voice and emphasise on the principle "nothing for us without us". This lays down the fundamental point of redefining the financial and governance architecture of COPs.

- ⇒ City representatives have been arguing for multi-level green deal governance and for revising the governance and regulation of energy and climate action. Likewise, some European city groups have been staunchly advocating for direct actions in cities.

#### Role of subnational governments:

- ⇒ Rafal Trzaskowski, ENVE chair and Mayor of Warsaw, leading member of the mayor's delegation for COP-28, argued for formally recognising the role of subnational governments in global climate change negotiations, accelerating and scaling up climate action by working across all levels of governance and sectors, and providing direct financing and technical assistance to cities and regions.
- ⇒ This will require an 'out of the box' imagination as it would mean transgressing the authorities of federal governments.
- ⇒ The moot point is that cities and regions are key actors in driving climate ambition forward and in creating green jobs, reducing air pollution, and improving human health and well-being. The efforts of city governments should be formally recognised in COP decision documents.

#### What can be done in the Global South?

- ⇒ The cities of the Global South are far more vulnerable than their western counterparts. The city leaders are hardly empowered, the major employment is in the informal sector, adaptation is key as most cities are vulnerable to climate induced disasters and the pent up drive to attract investments to cities has further widened the gap between the rich and the poor.
- ⇒ In most countries, and in India particularly, 40% of the urban population live in slums. Pollution is a major contributor in reducing life expectancies and social and economic inequities are quite inherent in their systems.
- ⇒ So, to ensure fair participation in climate action plans and to claim loss and damage compensation, etc., there has to be a radical shift in the processes governing the cities.
- ⇒ One of the ways of achieving progress, even if that is too little, can be through creating a climate atlas of these cities, mapping them and identifying hotspots. Here, a major support system from existing financial architecture including the outcome of COPs is required.
- ⇒ During the preparation of Nationally Determined Contributions (NDCs) and National Adaptation Plans, cities find themselves excluded from the process of climate action plans.
- ⇒ There is hardly any representation of city leaders and civil society groups in this process. Hence, reclaiming space at COPs and during the run up to them in respective countries should happen parallelly.

**Way Forward:**

- Some cities like Chennai are spearheading their climate action plan and have decided to meet their zero emission targets by 2050, even before the Indian national government's stipulated time period of 2070.
- Though this may sound too ambitious, it qualifies the point that cities are at the forefront in reclaiming spaces in meeting climate action plans and hence should get a fair share in planning both mitigation and adaptive strategies.
- COP-28 may have been a damp squib as many say, however, it has brought to fore the crucial question of acknowledging the interconnections, interdependencies and interconnectedness of climate action, social justice and the role of the urban world.

### ARCTIC WATER IS EMITTING CARBON AS GLOBAL WARMING SLAMS THE REGION

**Why in news?**

- The Arctic Ocean, a vital carbon sink absorbing an estimated 180 million metric tons of carbon annually, is now facing a new challenge.
- Recent scientific research has revealed that the Mackenzie River, one of North America's largest rivers, is contributing to a significant release of carbon dioxide (CO<sub>2</sub>) into the atmosphere from the Arctic Ocean, particularly in the Beaufort Sea region.

**Recent study:**

- A study conducted earlier in 2023 utilised advanced computer modeling to analyse the impact of the Mackenzie River on the Arctic Ocean's carbon cycle.
- The river, which originates near Alberta and traverses through Canada's Northwest Territories, carries a mix of mineral nutrients and organic matter to its delta.
- This influx of carbon-rich materials into the Beaufort Sea leads to a process known as outgassing, where CO<sub>2</sub> is released into the atmosphere.

**ECCO-Darwin model:**

- The researchers from France, the United States, and Canada employed the ECCO-Darwin model, developed by NASA's Jet Propulsion Laboratory and the Massachusetts Institute of Technology.

- This model assimilates ocean observations collected over two decades, providing a detailed simulation of the river's discharge and its effects from 2000 to 2019.

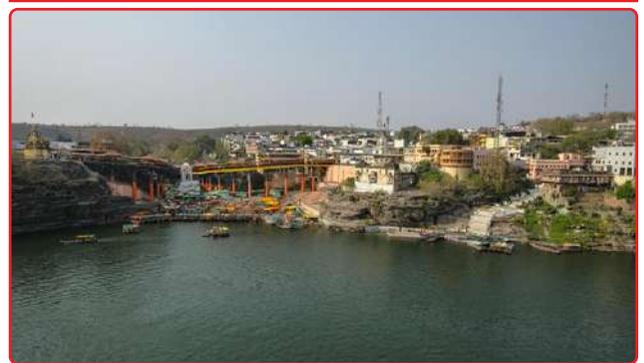
**Key findings:**

- The Mackenzie River's discharge led to such intense CO<sub>2</sub> outgassing that it shifted the balance, causing a net release of 0.13 million metric tons of CO<sub>2</sub> per year. This amount is comparable to the annual emissions from approximately 28,000 gasoline-powered vehicles.
- The release was more pronounced during warmer months when river discharge peaked and sea ice was less prevalent to contain the gas.
- The Arctic, warming at least three times faster than the rest of the planet since the 1970s, is undergoing profound transformations. Thawing permafrost and melting snow and ice are increasing river flows, flushing more organic matter into the ocean.
- Concurrently, diminishing sea ice is allowing phytoplankton to bloom, capturing atmospheric CO<sub>2</sub> through photosynthesis. These conflicting processes highlight the complex dynamics at play in the Arctic's response to climate change.

**Way Forward:**

- The ECCO-Darwin model is not only shedding light on the Beaufort Sea but also enhancing understanding of broader environmental shifts in the Arctic.
- As the region continues to warm, monitoring these changes is crucial, given the ocean's role as a critical buffer against climate change, sequestering nearly half of the carbon produced by fossil fuel combustion.

### PENINSULAR RIVER BASINS IN INDIA MORE LIKELY TO FACE WIDESPREAD FLOODING THAN TRANSBOUNDARY RIVERS, STUDY

**Why in news?**

- River basins in peninsular India face a higher probability of widespread flooding compared to the Ganga and Brahmaputra, according to a new study published.

**Details:**

- Narmada basin has the highest probability (59 per cent) of widespread flooding, followed by Mahanadi

- (50 per cent), Godavari (42 per cent), Krishna (38 per cent) and Cauvery (19 per cent).
- As for transboundary river basins, Ganga and Brahmaputra have a probability of 21 per cent and 18 per cent, respectively.
- Widespread flooding causes enormous losses and damages compared to localised flooding, as it covers a large part of a river basin.

**Basis of research:**

- The researchers from the Indian Institute of Technology Gandhinagar analysed the occurrence of widespread floods in seven major river basins in the Indian subcontinent, such as Ganga, Brahmaputra, Godavari, Krishna, Mahanadi, Narmada and Cauvery in 1959-2020.
- With 40 events in the period, the Mahanadi and Narmada river basins had the highest frequency of widespread floods, the analysis showed.
- Krishna and Godavari basins witnessed more than 20 widespread floods, while Ganga, Brahmaputra and Cauvery basins saw less than 15 events in the period.

**Key Highlights:**

- They also found strong seasonal trends in widespread flood probability in the subcontinental river basins. For example, during the summer monsoon season, all seven river basins, except Cauvery, experienced widespread flooding in August.
- Godavari, Mahanadi and Narmada basins recorded widespread flooding in July, August and September.
- The trend of seasonality is also tied to rainfall. India receives around 80 per cent of the total annual precipitation during the summer monsoon season from June-September.
- Godavari, Mahanadi, and Narmada basins lie in the core monsoon region and receive more rainy days in July to September, the findings showed.
- The Cauvery faces flooding in October-December, as most of the river's subbasins receive rainfall during the northeast monsoon season.
- The Brahmaputra river basin experienced widespread floods during June-July as the northeast region receives rainfall earlier compared to north Indian states.

**Factors responsible:**

- The researchers also looked at the drivers of widespread flooding. The 2018 Kerala floods, 2022 Pakistan floods and lower Mississippi river floods in 2008, 2011 and 2015-19 have been linked with atmospheric rivers that usually carry moisture from the tropics to the extratropics.
- Atmospheric rivers are large sections of the Earth's atmosphere carrying water vapour through the sky.
- Widespread floods in India are associated with large atmospheric circulations that cause precipitation in the river basin, the study noted.

- The drivers of widespread floods are expected to alter the timing, occurrence, and probability of widespread floods in a warming climate.

**PREDICTING EXTREME RAINFALL USING PROBABILISTIC FORECASTS**



**Why in news?**

- While Tamil Nadu was recovering from the devastation caused by the tropical cyclone Michaung, another catastrophic event occurred.

**Details:**

- The southern districts of Tamil Nadu; Thoothukudi, Tirunelveli, Tenkasi and Kanyakumari experienced unprecedented and extremely heavy rainfall. At least nine rain gauge stations in these districts reported heavy rainfall of more than 50 cm.
- The Kayalpattinam station in Thoothukudi recorded 95 cm of rainfall in just 24 hours. In terms of probability, this event could be termed as a once in a hundred-year event.
- These heavy rains led to massive and widespread flooding, caused extensive damage, and claimed a few lives.

**Factors:**

- The 2023 northeast monsoon was in an active phase during this episode, characterised by the presence of an east-west trough (or ITCZ).
- The unprecedented heavy rainfall was associated with an easterly wave with an embedded cyclonic circulation that moved from the southwestern Bay of Bengal across southern Tamil Nadu and Kerala into the southeastern Arabian Sea.
- There was a large-scale, intense convergence of winds with the influx of abundant moisture into the region. The north-south running hills along the Tamil Nadu-Kerala border are also likely to have contributed to the dynamics of the heavy rains.

**IMD forecast:**

- The India Meteorological Department (IMD) had predicted extreme rainfall (more than 20 cm of rainfall in 24 hours) for December 18 about 48 hours in advance and issued a red level warning.

- But rainfall of more than 50 cm was not expected at all. Compared to a tropical cyclone, this weather system was weaker. A review of the available numerical weather prediction (NWP) model forecasts showed that no model could predict the intensity of this heavy rainfall event.
- The models only predicted heavy rainfall in the order of 20-25 cm in 24 hours. However, the numerical weather prediction models cannot make a quantitative prediction for this kind of outlier—95 cm of rainfall.

### Probabilistic forecasts:

- For the prediction of extremes, a probabilistic approach is generally used extensively to calculate the probability of such extreme events occurring in each region. These probabilistic forecasts can be generated using an ensemble approach, where we generate a larger number of forecasts (30-40 forecasts) with perturbed initial conditions.
- The Indian Institute of Tropical Meteorology (IITM) in Pune has developed such a prediction system for making probabilistic forecasts.
- This ensemble forecasting system was able to suggest the high probability of occurrence of extreme rainfall events in southern Tamil Nadu almost three days in advance. But the prediction did not indicate 95 cm rainfall in Thoothukudi.
- Probabilistic forecasts provide more lead time, which can be used for better preparation. End users should be trained to use probabilistic methods for proper mitigation of such extreme events.
- The fact that this event is a hundred-year event does not mean that it can happen only after 100 years. It could happen next year too.
- The IPCC models indicate that extreme precipitation events may occur more frequently as global warming progresses. Heavy rainfall of this magnitude due to a relatively weak weather system should worry us.

### Way Forward:

- To meet the challenge of climate change, a comprehensive strategy that includes robust early warning systems, sustainable urban planning, ecosystem conservation, global climate action and community engagement is essential to effectively mitigate the impacts of increasing extreme precipitation events.
- The robust early warning system is very vital, but it is only one component of this comprehensive strategy. More research is required for a better understanding of the physical processes of these extreme events. Public awareness and education also play a crucial role in building resilience.
- Communities should be educated about the risks associated with extreme precipitation events and receive information on how to prepare and respond

effectively. Taking proactive measures today will contribute to a more resilient and sustainable future for generations to come.

## INDIA LOST 204 TIGERS IN 2023, MOST OF THEM IN MAHARASHTRA, WPSI



### Why in news?

- India lost a record 204 tigers in 2023 from January 1-December 25, according to figures compiled by non-profit, Wildlife Protection Society of India (WPSI).

### State-wise data:

- Maharashtra, with 52 deaths, topped the list of Indian states. It was followed by Madhya Pradesh with 45 deaths. Uttarakhand came next with 26 deaths,.
- Tamil Nadu and Kerala recorded 15 deaths each.
- Karnataka, which has the second-highest number of tigers in the country after Madhya Pradesh, registered 13 deaths. Assam and Rajasthan recorded 10 deaths each.
- Uttar Pradesh recorded 7 deaths. Bihar and Chhattisgarh recorded 3 deaths each, with Odisha and Andhra Pradesh witnessing the deaths of two tigers each. Telangana recorded one tiger death in 2023.

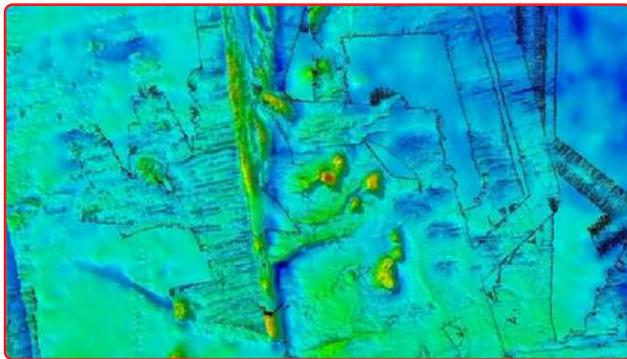
### Reasons for death:

- The reasons for tiger deaths were varied. 'Natural & other causes' claimed 79 tigers, the biggest cause of death.
- This was followed by poaching due to which 55 individuals died. Infighting came next. It caused the deaths of 46 tigers.
- Fourteen tigers died during rescue/treatment. Linear infrastructure/Roadkill/ Train or road deaths caused seven tiger deaths.
- Two tigers were killed by other species while one was shot by the forest department/ police or killed by villagers.

### India's tiger population:

- India's tiger population increased by 200 from 2018 to 2022, according to the fifth cycle of the All India Tiger Estimation (2022) released April 9, 2023.
- The number of tigers in India was 3,167 in 2022, up from 2,967 in 2018.

**ANCIENT UNDERWATER MOUNTAIN RANGE DISCOVERED IN SOUTHERN OCEAN**



**Why in news?**

- Scientists have discovered an ancient underwater mountain range hidden within the world's strongest ocean current, the Antarctic Circumpolar Current.
- This revelation came to light during a high-resolution mapping expedition conducted by an Australian and international research team.

**Details:**

- The research voyage, aboard the CSIRO research vessel Investigator, explored a vast area of the Southern Ocean, stretching 20,000 square kilometers between Tasmania and Antarctica.
- The seafloor, reaching depths of 4,000 meters, was mapped in unprecedented three-dimensional detail, revealing a spectacular chain of eight long-dormant volcanoes, with peaks soaring up to 1,500 meters high.
- The FOCUS voyage was designed to complement the capabilities of the new Surface Water and Ocean Topography (SWOT) satellite, developed jointly by NASA and the French space agency CNES.

**Key Findings:**

- The findings included four newly discovered volcanoes and detailed information on previously partially mapped seamounts and a fault line ridge.
- The survey area, located 200 nautical miles west of Macquarie Island, sits atop the tectonically active Macquarie Ridge, where these seamounts were formed by hotspot magmatism within the last 20 million years.

**Significance:**

- The Antarctic Circumpolar Current interacts with the seafloor, creating eddies that play a significant role in transporting heat and carbon deeper into the ocean, thus serving as a buffer against global warming.
- The discovery provides crucial insights into the behavior of ocean currents and their impact on climate

**Way Forward:**

- They emphasized the urgency of understanding the ocean's role as a 'climate shock absorber,' absorbing

over 90% of the heat from global warming and about 25% of human CO2 emissions.

- They focused on how heat is channeled towards Antarctica, affecting ice melt and contributing to sea-level rise, a critical concern for climate change mitigation efforts.

**SCIENCE & TECHNOLOGY**

**THE TRANSFORMATIVE BENEFITS OF POPULATION-LEVEL GENOME SEQUENCING**



**Why in news?**

- Recently, the UK announced the completion of half a million whole-genome sequences, almost 0.7% of its population.
- Such data-sets are transformative, with far-reaching implications for both immediate and long-term advancements in the biological sciences.

**The deCODE initiative:**

- An early effort to use large-scale population genetic studies was initiated in Iceland by deCODE genomics in 1996, with most of the Icelandic population enrolling for genetic studies in around a decade's time.
- The initiative, along with the democratisation of sequencing technologies, provided the initial impetus for programmes that wished to use population-scale genomic data for precision medicine and public health.
- The deCODE effort considerably improved understanding of the genetics of diseases and the utility of such data in risk assessment.
- It also contributed significantly to the methods, infrastructure, and standards with which researchers handle large-scale genomic data and set up discussions on their bioethics.
- The project also laid the groundwork to integrate medical records and people's genealogies, resulting in new drugs and therapeutics.

**Ongoing genome projects:**

- deCODE's success plus the wider availability of sequencing technologies gave rise to a number of population-scale genome initiatives around the

world, including many pilot programmes initiated in the last decade.

- A recent initiative by the pharmaceutical companies Regeneron Genetics Center, AstraZeneca, Novo Nordisk, and Roche, along with the Meharry Medical College, Tennessee, has even planned to sequence more than five lakh individuals of African ancestry through the Diversity Human Genome Initiative.
- Many large-scale genome programs are currently underway, including the AllofUS programme in the U.S., which will collect genetic information of a million people with funding from the National Institutes of Health.
- The European Union recently launched the '1+ Million Genomes' initiative.
- A 'Three Million African Genomes' is also currently in the works, as is the Emirati genome programme's scheme to sequence more than a million samples (more than 400,000 have already been completed).

#### Diverse objectives:

- Many programmes take advantage of a unique population composition to understand disease prevalence and biomarkers for diseases, and use that to inform the discovery of novel therapeutic targets.
- Other efforts seek to build scalable public-health initiatives where genomic data is used in decision-making and medical care.
- For example, according to one estimate, 18.5% of the UK's 100K initiative was actionable, translating to direct healthcare benefits to participants.

#### Challenges:

- There are new challenges, especially with regard to the ethics of and the access to these genomes, and the discoveries that build on them.
- There are also significant concerns regarding the equitable representation and access to the fruits of discoveries (e.g. over-representation of certain ethnic groups in population-scale data sets).
- Countries like the U.S. have also proactively created regulatory frameworks to prevent the misuse of genetic data, such as to prevent insurance and employment discrimination, using the terms of the Genetic Information Non-discrimination Act.

#### Genomes from India:

- Asia, and India, are not far off vis-à-vis population-level sequencing either. The GenomeAsia project, led by multiple partners across the continent, plans to sequence a lakh whole genomes from diverse populations.
- An initial pilot data set with whole genomes of 1,739 individuals belonging to 219 population groups in 64 countries was published in 2019.
- A pilot programme for population genomes in India named IndiGen provided an early view of more than a thousand genomes of individuals from cosmopolitan areas in India.

- It also yielded some clues to the landscape of many treatable genetic diseases and variants of clinical significance, including the efficacy and toxicity of drugs and the prevalence of rare disorders. A larger programme to sequence 10,000 whole genomes from diverse population groups is in the works under the GenomeIndia initiative.

#### Way Forward:

- Looking to the horizon, the long-term impact of population-scale genomics extends beyond individual health, shaping our comprehension of human evolution, migration patterns, and adaptation to diverse environments.
- It will also contribute significantly to our knowledge of human biology.
- In essence, population-scale genomics stands at the forefront of a genomic revolution, poised to revolutionise healthcare, illuminate our evolutionary history, and propel us towards a future in which precise, personalised approaches will influence the landscape of medical and biological understanding.

### ISRO TO ILLUMINATE COSMIC MYSTERIES OF BLACK HOLES WITH LAUNCH OF XPOSAT MISSION



#### Why in news?

- India's first X-Ray Polarimeter Satellite (XPoSat) will delve into the mysteries of cosmic X-ray sources.
- The Indian Space Research Organisation (ISRO) has planned this mission to study the polarisation of X-rays from astronomical entities, such as neutron stars, black holes, and other energetic phenomena.

#### Details:

- The XPoSat mission is expected to be launched in the final weeks of December, aboard a Polar Satellite Launch Vehicle (PSLV).
- It will carry two scientific payloads into a low Earth orbit at an altitude of approximately 650 kilometers. These instruments are designed to operate for around five years, providing valuable data that will enhance our understanding of the universe.

**Payloads:****POLIX:**

- ⇒ The primary payload, POLIX (Polarimeter Instrument in X-rays), developed by the Raman Research Institute (RRI) in collaboration with ISRO's U R Rao Satellite Centre (URSC), is set to measure the degree and angle of polarisation in the medium X-ray energy range of 8-30 keV.
- ⇒ This instrument is a Thomson X-ray polarimeter, which includes a collimator, a scatterer, and four X-ray proportional counter detectors.
- ⇒ POLIX is expected to observe about 40 bright astronomical sources during the mission's lifetime, making it the first payload dedicated to medium X-ray band polarimetry measurements.

**XSPECT:**

- ⇒ Complementing POLIX, the XSPECT (X-ray Spectroscopy and Timing) payload will provide spectroscopic information and timing of soft X-rays in the energy range of 0.8-15 keV.
- ⇒ Developed by ISRO's Space Astronomy Group, URSC, XSPECT aims to understand the long-term behavior of X-ray sources through correlation of timing characteristics with spectral state changes and emission line variations.

**Significance:**

- ⇒ XPOsat's mission objectives are multifaceted, including the measurement of X-ray polarisation, which is a powerful tool that allows astronomers to infer information about celestial objects, from their magnetic fields to the nature of the accelerator responsible for energising the electrons involved in radiation and scattering.
- ⇒ The mission will also conduct long-term spectral and temporal studies of cosmic X-ray sources, bridging an energy gap in detection capability between existing soft and hard X-ray polarimeters.
- ⇒ The observatory will focus on the 50 brightest known sources in the universe, including pulsars, black hole X-ray binaries, active galactic nuclei, and non-thermal supernova remnants.

**Way Forward:**

- ⇒ This endeavor places India at the forefront of X-ray polarimetry, following NASA's Imaging X-ray Polarimetry Explorer (IXPE), making XPOsat the world's second mission dedicated to such measurements.

**INDIA'S SPADEX MISSION****Why in news?**

- ⇒ The Indian Space Research Organisation (ISRO) has once again demonstrated its prowess in space exploration with the successful return of Chandrayaan-3's propulsion module to Earth's orbit.



- ⇒ The propulsion module, initially tasked with transporting the Chandrayaan-3 lander to the Moon, showcased its versatility by returning to Earth orbit, thus proving ISRO's capability to not only reach the Moon but also to bring payloads back to Earth.

**How are rocks brought from the Moon to Earth?**

- ⇒ Plans to return samples with Chandrayaan-4 or future Indian astronauts from the Moon will not be easy and will have to be divided into multiple steps. These include:-
  - a) Soft landing and Sample Collection: This involves safely landing a spacecraft on the lunar surface and collecting samples for analysis.
  - b) Lift-Off from the Moon: This step requires the spacecraft to launch from the lunar surface to re-enter lunar orbit.
  - c) In-Orbit Docking with the Sample Return Module: This step involves the spacecraft, now with lunar samples, docking with a module in orbit for the journey back to Earth.
  - d) Travelling back from the Moon towards Earth: This phase covers the return journey of the spacecraft from lunar orbit to Earth.
  - e) Re-Entry and Touchdown: The final step is the re-entry of the spacecraft into Earth's atmosphere and a safe landing.

**ISRO's success:**

- ⇒ With Chandrayaan 3, ISRO successfully showcased its ability for soft landing, as seen with the Vikram lander on August 23, 2023. This step is critical for any mission involving surface exploration or sample collection.
- ⇒ Then, on September 3, 2023, ISRO further demonstrated its capability to re-ignite engines on the lunar surface. This technology was tested during the short duration 'HOP' test of the Vikram Lander, proving crucial for the lift-off stage from the Moon.
- ⇒ Chandrayaan 3's success in carrying out in-situ experiments on the lunar surface, including the use of a drill bit, highlights ISRO's capability in sample collection, an integral part of lunar exploration.
- ⇒ ISRO's recent maneuver, using leftover fuel in a propulsion module to transition from lunar orbit to

Earth-bound orbit, showcased the ability to bring a spacecraft back from the Moon to Earth.

- The 2007 SRE experiment, which involved bringing back a 550 kg SRE capsule from a 635 km polar orbit, demonstrated ISRO's readiness for re-entry into the Earth's atmosphere and safe touchdown.

#### ISRO's Spadex mission:

- With these four steps already in its arsenal, ISRO's Spadex mission is set to tackle the final and equally critical component: demonstrating in-orbit docking mechanisms.
- This is not just an essential step for the success of Chandrayaan 4 but is also vital for future missions, including India's aspirations for a manned space station and lunar exploration.

#### Docking maneuver:

- The core of Spadex involves the launching of two spacecraft, aptly named the Chaser and the Target, in an integrated form. This initial phase is just the beginning of a highly intricate space ballet.
- Once in orbit, these two spacecraft will part ways, only to engage in a sophisticated and autonomous docking procedure later.
- The successful execution of this docking maneuver will be a clear demonstration of ISRO's advanced capabilities in space navigation and robotics.

#### Strategic significance:

- This mission will be a strategic milestone for India, opening up new possibilities in space exploration. Mastering the technology for in-orbit docking is essential for more complex interplanetary missions, which could include manned missions or even deep space exploration.
- Furthermore, such technological prowess is key to enabling international collaborations in the space arena, positioning India as a desirable partner in future multinational space projects.

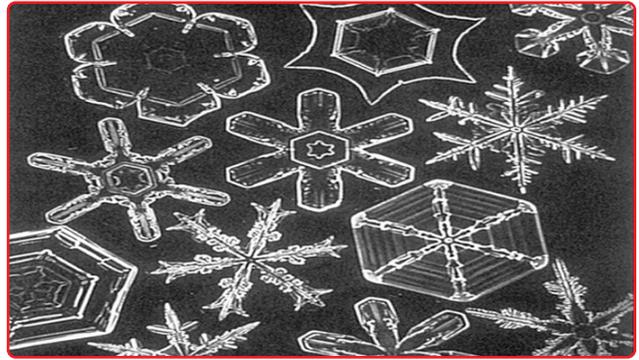
#### Way Forward:

- Spadex is emblematic of India's growing scientific and technological power. It is a mission that underlines the country's ambitious vision in space exploration.

### HOW FRACTALS OFFER A NEW WAY TO SEE THE QUANTUM REALM

#### Context:

- Uncertainty is an inherent feature of all systems. It is independent of the precision or the accuracy with which the system is measured.
- It has forced physicists to find a practical approach to study quantum systems in ways that can circumvent the limitations it imposes.
- One of the ways in which physicists have responded is via the so-called non-integer small dimensions, a.k.a. fractal dimensions.



#### What are fractal dimensions?

- The dimensionality of a quantum system is an important thing to bear in mind when physicists study its properties.
- For instance, electrons in a one-dimensional system form a Luttinger liquid (not a liquid per se but a model that describes the electrons' liquid-like behaviour); in a two-dimensional system, the particles exhibit the Hall effect (the conductor develops a side-to-side voltage in the presence of a top-to-bottom electric field and a perpendicular magnetic field).
- Physicists use the fractal geometry approach to study quantum systems in dimensions like 1.55 or 1.58, or in fact anything between one and two dimensions.
- Fractality is ubiquitous in nature, if also sometimes hidden from plain sight. A shape is fractal if it exhibits self-similarity, i.e. if parts of it at a smaller scale resemble parts at a larger scale. Such shapes can be easily produced by repeatedly modifying its edges using simple rules.
- Consider the Koch snowflake – a shape that begins as an equilateral triangle, and in each subsequent step, every side becomes the base for a new triangle. After many steps, a fractal snowflake appears.
- The higher the 'value' of a fractal's dimension, the greater is its ability to fill space as its shape evolves. For example, the Koch snowflake has a fractal dimension of around 1.26.

#### What do fractals look like?

- On the macroscopic scale, fractals can be seen as irregular, complex patterns at all scales and in all views, near or far.
- Some of the more remarkable examples of such patterns include the design of human fingerprints, the stumps of trees, in the shells of snails, the system of human veins, the network of rivers as seen from high up, the splitting of veins in a plant leaf, the edges of a snowflake, a bolt of lightning going branching off in different directions, the shapes of clouds, the mixing of liquids of different viscosity, the way tumours grow in the body, and so on.
- There are fractals in the quantum realm as well. In a study published in 2019, for example, researchers from Switzerland and the U.S. used X-rays to study

the magnetic properties of a compound called neodymium nickel oxide.

- They erased its magnetic order (the parts of its internal order imposed by magnetic fields) and then restored it. To their surprise, they found that parts of the material's insides where the magnetisation was in the same direction called magnetic domains had a fractal arrangement.
- They also found that the domains reappeared in almost the same positions they were in before they were erased, as if the material had a memory. All these effects were due to the material's quantum physical properties.

**Applications of fractality:**

- The first attempt to apply fractal analysis in physics was for Brownian motion, the rapid, random, zigzagging motion of small particles suspended in a liquid medium, like pollen in water. As such, the value of fractals is that they describe a new kind of order in systems that we may have otherwise overlooked.
- They pave the way to potential new insights from otherwise familiar shapes like lines, planes, and points, in the unfamiliar milieu of a space with non-integer dimensions.
- Researchers have also used the concept of fractality in data compression, such as to reduce the size of an image when storing it, and to design more compact antennae without compromising their performance.
- Some have also used fractality to study patterns in galaxies and planets and, in cell biology, to make sense of some bacteria cultures. Fractal geometry has also found applications in chromatography and ion-exchange processes, among others.

**NASA ESTABLISHES LASER SYSTEM THAT TRANSFERS DATA AT 1.2 GB PER SECOND FROM SPACE**



**Why in news?**

- NASA has successfully established a new system of communication that could be used for long-distance data transmission billions of kilometers away from Earth.
- The International Space Station (ISS) completed its first successful laser link with an in-orbit laser relay

system completing NASA's first two-way, end-to-end laser relay system, a significant step forward in enhancing data transmission from space.

**Optical communication:**

- The collaboration between the Laser Communications Relay Demonstration (LCRD) and the Integrated LCRD Low Earth Orbit User Modem and Amplifier Terminal (ILLUMA-T) has demonstrated the potential for laser communications also known as optical communications to revolutionise how we receive data from space.
- Unlike traditional radio waves, laser communications use infrared light to send and receive signals, allowing for more data to be transmitted efficiently and potentially accelerating the pace of scientific discovery.

**About ILLUMA-T:**

- ILLUMA-T was launched aboard SpaceX's 29th Commercial Resupply Services mission on November 9, and was subsequently installed on the Japanese Experiment Module-Exposed Facility of the ISS.
- The successful operation of ILLUMA-T and its interaction with LCRD is part of Nasa's Space Communications and Navigation (SCaN) program's initiative to showcase the advantages of laser communications for both science and exploration missions.
- Following installation, engineers conducted rigorous on-orbit testing to confirm the functionality of the ILLUMA-T payload. Now, it is successfully exchanging data with LCRD at impressive speeds of 1.2 gigabits per second.

**LCRD:**

- LCRD, which was launched in 2021, has already performed over 300 experimental configurations to fine-tune NASA's laser communications capabilities.

**CT SCANS ASSOCIATED WITH INCREASED RISK OF BLOOD CANCERS**



**Context:**

- The benefits of computed tomography (CT) imaging in clinically needed cases are well known. However, its potential for increased cancer risks and relatively

high cumulative doses from multiple scans have raised concerns among the medical and scientific community.

- ⇒ Sensitive sections such as children, adolescents and young adults are vulnerable and technologists must use appropriate protocols for them while they undergo CT scans.

#### Impact of radiation:

- ⇒ Radiation doses at moderate (over 100mGy) to high (over 1Gy) values are known to cause haematological malignancies (blood cancers) in both children and adults and other cancers.
- ⇒ However, there has been uncertainty about risk at low doses (less than 100mGy) that are typically associated with diagnostic CT examinations.
- ⇒ A recent study suggests that even low doses of radiation have a small probability of causing blood cancer.

#### Basis of research:

- ⇒ Researchers from the International Agency for Research on Cancer (IARC) and its partners followed up a multinational cohort of 9,48,174 individuals who underwent CT examinations before age 22 years in 276 hospitals from nine European countries.
- ⇒ The final study covered about 1.3 million CT scans in nearly 9,00,000 patients. They estimated the radiation doses to the active bone marrow of each subject based on the body part scanned, patient characteristics, time period and inferred CT technical parameters.
- ⇒ Fifty-one percent of the cases were younger than 20 years at diagnosis, whereas 88.5% were younger than 30 years.
- ⇒ Researchers followed up the group for at least two years following their first CT scan.

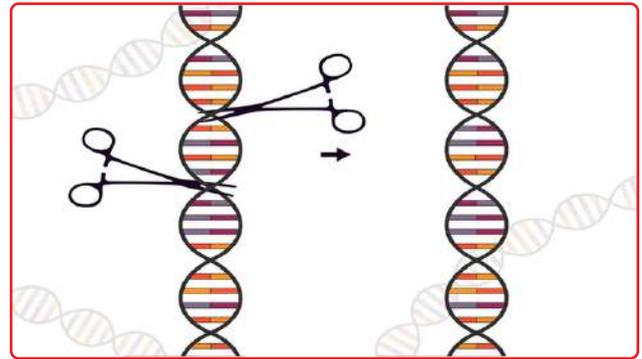
#### Key observations:

- ⇒ They identified 790 haematological malignancies including 578 cases of lymphoid malignancies and 203 cases of myeloid malignancies and acute leukaemia (AL). The mean follow-up period was 7.8 years.
- ⇒ The researchers found a clear association between cumulative dose and risk of all haematological malignancies, with an excess relative risk of 1.96 per 100mGy. Gray (Gy) is a unit of absorbed dose of radiation.
- ⇒ The energy absorbed in one Gy of radiation is one Joule per kg of tissue. Since Gy is a large unit, milli (one-thousandth) or micro (one-millionth) of a Gy are commonly used.
- ⇒ Researchers estimated that for every 10,000 children examined today (mean dose 8mGy), one-two persons are expected to develop a haematological malignancy attributable to radiation exposure in the subsequent 12 years.

#### Way Forward:

- ⇒ The results showed a clear dose-response between cumulative ABM dose and risk of haematological malignancies, both lymphoid and myeloid, with increased risk at doses as low as 10-15mGy.
- ⇒ Patients must realise that denying to undergo CT scans needed to diagnose disease is also harmful. The study highlights the need for diligently following the basic principles of radiation protection.

### THE ERA OF CRISPR THERAPEUTICS IS HERE



#### Why in news?

- ⇒ The world of medicine is currently abuzz with news of regulatory agencies' approval for two highly anticipated CRISPR-based therapies for sickle-cell disease and thalassaemia in the U.K. and the U.S.
- ⇒ The approval is groundbreaking because it signals an era that could transform the lives of millions of patients and families grappling with these inherited blood disorders.

#### The discovery of the CRISPR system:

- ⇒ Clustered regularly interspaced short palindromic repeats (CRISPR) are DNA elements that Spanish researchers discovered in archaea in 1993, and named and described later in a number of bacterial genomes.
- ⇒ These elements contain pieces of genetic material derived from viruses that infect bacteria (for example, bacteriophages) and a set of proteins called Cas, or CRISPR-associated.
- ⇒ Researchers tried to explain the elements' effect on antiviral immunity in 2005, but later found that CRISPR + Cas proteins could detect and prevent viral infections. That is, the two formed an antiviral defence system and helped bacteria 'acquire' resistance.
- ⇒ Then, in 2010, scientists demonstrated that CRISPR + specific proteins called Cas9 had the ability to cut double-stranded DNA at specific points. They also found the RNAs molecules that guided the Cas9 proteins to specific positions on a genome.
- ⇒ In 2012, researchers figured out a way to create synthetic RNA that could bind to Cas9 and guide it to a specific point on a DNA, where it could edit the DNA.

➤ This pathbreaking work came from the labs of Emmanuelle Charpentier and Jennifer Doudna, and they were awarded the 2020 Nobel Prize in Chemistry for it.

#### Progress:

- A study suggested that Cas9 could be targeted to specific genome locations by crRNA (crRNA).
- In all, the researchers demonstrated the utility of the CRISPR-Cas9 system as a programmable 'molecular scissor' that could cut in DNA at a chosen spot with unparalleled accuracy. The specific spot could be picked by modifying the crRNA accordingly.
- Another teams showed that CRISPR-Cas9 could be used to edit the genomes of eukaryotic organisms.
- This innovation has since spurred a myriad applications, from targeted genetic therapies to agricultural advancements.

#### CRISPR in medicine:

##### Casgevy:

- In November 2023, the national regulator in the U.K., the Medicines and Healthcare products Regulatory Agency (MHRA), approved the use of a CRISPR-based method called exagamglogene autotemcel sold under the brand 'Casgevy' to treat sickle-cell disease and transfusion-dependent -thalassemia.
- The approval came after the MHRA evaluated safety and efficacy data in an ongoing clinical trial in 29 and 42 patients respectively.
- In close succession, the U.S. Food and Drug Administration also approved Casgevy to treat sickle-cell disease, rendering it one of the first CRISPR-based therapeutics to be approved by two major drug regulators.

##### First-generation technologies:

- In Casgevy, a patient's blood stem cells are extracted, their genes modified to remove the defect that produces the sickling, and regrafted back. These cells then proliferate to produce normal red blood cells. The approvals come full circle 74 years after Linus Carl Pauling described the disease as a molecular disorder.
- While researchers have developed drugs to treat the symptoms of the disease, Casgevy's approval signals their ability now to fix its molecular basis.
- They are all based on what researchers call first-generation technologies.

##### New applications:

- CRISPR-based clinical technologies have grown to become more efficacious as well as efficient, with a panoply of new applications and specificities.

##### Base-editing:

- One fascinating approach is called base-editing, where scientists edit genomes at the resolution of a single nucleotide (DNA is a polymer consisting of multiple nucleotides chained together).

➤ Recently, Verve Therapeutics announced results from an important clinical trial it has been conducting to test a base-editing approach to treat familial hypercholesterolemia, another prevalent and oft-undiagnosed genetic disease.

##### Prime editing:

- Another emerging technique is prime editing, where researchers use a search-and-replace strategy to directly write or insert specific sequences into an existing genome with high accuracy.

##### Modifying epigenetic effects:

- A fourth example is of systems that use CRISPR to modify epigenetic effects (effects of a body's environment on its genes) in targeted fashion.

##### Way Forward:

- None of these technologies are without caveats. Researchers have already reported several safety and accuracy issues. An important one is off-target events: where a CRISPR-Cas9 system becomes inaccurate and edits some other part of the genome, with unintended consequences.
- So while there is enormous potential for these technologies, the risk needs to be balanced with both short- and long-term benefits. Many of these therapies are also too early in their development cycle.
- Casgevy et al. mean for the millions of people suffering from genetic diseases, including those whose molecular mechanisms remain unknown.

### AN OVERVIEW OF THE EUROPEAN UNION'S ARTIFICIAL INTELLIGENCE ACT



##### Context:

- The European Union's Artificial Intelligence (AI) Act is a significant legislative initiative aimed at regulating artificial intelligence technologies within the EU.
- The objectives of the EU AI Act are to create a regulatory framework for AI technologies, mitigate risks associated with AI systems, and establish clear guidelines for developers, users, and regulators.
- The act aims to ensure the responsible use of AI by protecting fundamental rights and promoting transparency in AI applications.

## Strengths of the Act

### Risk bases approach:

- One of the notable strengths of the EU AI Act is its risk-based approach. The legislation categorises AI applications into different risk levels, ranging from unacceptable to low. This approach enables tailored regulations, with higher-risk applications subject to more stringent requirements.
- This flexibility acknowledges AI technologies' diverse potential impact on society. It also explicitly prohibits certain AI practices deemed unacceptable, such as social credit scoring systems for government purposes, predictive policing applications, and AI systems that manipulate individuals such as emotional recognition systems at work or in education.
- This prohibition reflects the EU's commitment to preventing the misuse of AI technologies.

### Transparency and accountability:

- The EU AI Act emphasises transparency and accountability in AI development and deployment.
- It requires developers to provide clear information about the capabilities and limitations of AI systems, enabling users to make informed decisions.

### Regulatory oversight & Assessment:

- The legislation mandates that developers maintain comprehensive documentation to facilitate regulatory oversight.
- Moreover, to ensure compliance with the regulations, the EU AI Act introduces the concept of independent conformity assessment.
- Higher-risk AI applications like medical devices, biometric identification, and access to justice and services, must undergo assessment processes conducted by third-party entities.
- This approach enhances objectivity and reduces the risk of conflicts of interest, contributing to the credibility of the regulatory framework.

### Limitations:

- One of the criticisms of the EU AI Act is the challenge in accurately defining and categorising AI applications. The evolving nature of AI technologies may make it difficult to establish clear boundaries between different risk levels, potentially leading to uncertainties in regulatory implementation.
- Critics have also argued that the stringent regulations in the EU may hinder the competitiveness of European businesses in the global AI market.
- While the Act aims to ensure ethical AI practices, some fear that overly restrictive measures could stifle innovation and drive AI development outside the EU.
- Additionally, compliance with the EU AI Act may impose a significant burden on smaller businesses and start-ups.

- The resources required for conformity assessments and documentation may disproportionately affect smaller players in the AI industry, potentially limiting their ability to compete with larger, more established counterparts.
- Striking the right balance between regulation and fostering innovation is crucial, with critics arguing that the EU AI Act may lean too heavily towards stringent controls.

### The potential implications:

- The EU AI Act is likely to have a global impact, influencing the development and deployment of AI technologies beyond the EU's borders. As a major economic bloc, the EU's regulatory framework may set a precedent for other regions, shaping the trajectory of AI development on a global scale, just like the MiCa regulation did for crypto-assets.
- By prioritising ethical considerations and fundamental rights, the EU AI Act contributes to the establishment of global norms for AI development. The impact on innovation and competitiveness will depend on the balance struck by the EU between regulation and fostering a conducive environment for AI development.
- It encourages collaboration and cooperation between regulatory authorities, fostering a unified approach to AI regulation. International collaboration in regulating AI technologies is essential to address global challenges and ensure consistent standards across borders.

### Implementation:

- Any individual has the right to report instances of non-compliance. The EU member states' market surveillance authorities will be responsible for enforcing the AI Act. There will be specific limits on fines applicable to small and medium-sized enterprises (SMEs) and start-ups.
- The EU will establish a centralised 'AI office' and 'AI Board.' In case businesses do not adhere to the EU AI Act, fines could range from \$8 million to almost \$38 million, depending on the nature of the violation and the company's size.
- For instance, fines may amount to up to 1.5% of the global annual turnover or €7.5 million for providing incorrect information, up to 3% of the global annual turnover or €15 million for general violations, and up to 7% of the global annual turnover or €35 million for prohibited AI violations.

### Way Forward:

- The EU's AI Act represents a significant step towards regulating AI technologies responsibly and ethically. While it addresses key concerns associated with AI, such as transparency, accountability, and risk mitigation, there are challenges and potential drawbacks that need careful consideration.

- The global impact of the EU AI Act and its potential to shape international norms make it a landmark initiative in the ongoing discourse on the responsible development and deployment of artificial intelligence.

**OCTOPUS DNA HIDES BIG SECRET ABOUT ANTARCTIC DOOMSDAY**



**Why in news?**

- Scientists have discovered through DNA analysis that the Turquet's octopus (*Pareledone turqueti*), residing in the Weddell and Ross Seas, were not always separated by the vast expanse of ice that now divides them.

**Details:**

- This genetic connection points to a time approximately 1,25,000 years ago when the colossal West Antarctic Ice Sheet (WAIS), which currently stands at an immense 2.2 million cubic kilometers, had completely disintegrated into the ocean.
- The evidence of gene flow between these two octopus populations around 70,000 years ago suggests that ancient seaways once bridged what is now an icy barrier.
- The implications of this discovery are profound, as they indicate that the WAIS has collapsed under past climate conditions similar to today.

**Instability of the WAIS:**

- For decades, scientists have grappled with the potential instability of the WAIS. Some early warnings of disaster date back half a century, while more recent climate models from just a decade ago failed to predict significant ice loss within the century, a prediction that has proven to be alarmingly inaccurate.
- Currently, West Antarctica is shedding massive icebergs at an unprecedented rate, dwarfing the ice loss of other continental regions.
- The Thwaites Glacier, ominously nicknamed the 'Doomsday Glacier,' is particularly concerning. If it were to collapse, it alone could contribute to a sea level rise of 65 centimeters.

**Human induced catastrophe:**

- The historical collapses of the WAIS were part of Earth's natural climatic cycles, not induced by human

activity. Today, however, the rapid global warming caused by human emissions during what should be a cooler period for the planet raises the stakes significantly.

- If human-induced global warming leads to the collapse of the entire WAIS, the consequences would be catastrophic. Scientists estimate that such an event could raise global sea levels by 3.3 to 5 meters, disrupt oceanic water circulation, and dramatically alter the world's coastlines.
- While researchers consider a complete collapse of the WAIS on a centennial timescale to be unlikely, even optimistic climate models project air temperatures to reach 1.2 to 1.7 degree Celcius by 2100.
- This temperature range eerily mirrors the conditions under which the WAIS previously collapsed, suggesting that we may be nearing a tipping point.

**Way Forward:**

- The study points to the urgent need to address climate change and its potential to reshape our world dramatically.

**INDIA CLOSER TO NEW DRONE POWER**



**Why in news?**

- Bengaluru-based NewSpace Research and Technologies Pvt Ltd (NRT) announced recently that its long-endurance drone, the solar-powered High Altitude Pseudo-Satellite (HAPS), had carried out its first flight lasting over 21 hours.
- The development comes as a big fillip to India's plan to have its own long-endurance drones capable of flying in the stratosphere.

**iDEX initiative:**

- The project is being spearheaded under the Innovation for Defence Excellence (iDEX) initiative of the defence ministry.
- Under this, NRT has signed a contract for an initial proof-of-concept demonstrator, which targets a solar-powered flight lasting longer than 48 hours.

**Make I project:**

- The IAF has included HAPS under a Rs 1,000 crore 'Make I project' of the Government of India. This means that 70 percent of the funding will come from the government.

**Key Features:**

- The flight included both day and night flying, with the Unmanned Aerial Vehicle (UAV) using solar energy for travel during the day and using its solar-charged battery for flying at night.
- The plan is to have it fly in the stratosphere at about 65,000 feet, above air traffic. For context, commercial aircraft typically fly between 31,000 and 38,000 feet, or at about 5.9 to 7.2 miles.
- Since the HAPS operates on solar power, it can continue to fly for months.
- Running exclusively on solar power and flying above the weather at 16-20 km autonomously for months at a stretch, a HAPS platform will fill a capability gap between satellites and HALE (High Altitude Long Endurance) UAVs.
- HAPS is ultra-lightweight but has a strong body with the ability to take onboard batteries and other systems. As the battery technology improves, the endurance would also grow.

**India's first stratospheric vehicle:**

- The HAPS UAV is part of a new genre of solar-powered platforms being designed across the world for persistent surveillance, communications, and specialist science missions.
- Both the IAF and the Navy are on board with the project and are looking at acquiring this capability in the short term as well as in the long term.

**Payloads:**

- The intended surveillance payloads for HAPS include electro-optical/ infra-red (EO/IR) solutions, synthetic aperture radars (SAR) besides communication payloads – including range extenders, electronic intelligence (ELINT) and electronic warfare (EW).
- The existing technology limits of the ISR payloads for HAPS allow observations of up to 80-100 km from stratospheric altitudes, which is 2-3 times more as offered by MALE (Medium Altitude Long Endurance) UAVs. ISR, or Intelligence, surveillance, and reconnaissance (ISR), is vital for military operations.

**Potential:**

- The HAPS technology will offset the lack of critical ISR gap felt during the Doklam crisis, the Balakot incident, and the ongoing crisis in Ladakh.
- The Navy will be an immediate beneficiary since this allows continuous low-cost manning of the Indian Ocean Region (IOR).
- The civilian use of HAPS is equally important since it can provide telecommunication connectivity all over India especially in regions with patchy terrestrial network issues because of the challenges of terrain and costs.

## NASA RENAMES MISSION GOING TO ASTEROID APOPHIS AFTER RETURNING ROCKS FROM BENNU

**Why in news?**

- The OSIRIS-REx spacecraft that delivered asteroid samples from Bennu, has embarked on a new mission, and NASA has renamed it.
- The mission will now be called OSIRIS-APEX as it heads to study the near-Earth asteroid Apophis.

**Details:**

- The OSIRIS-REx mission made headlines when it successfully returned a sample from asteroid Bennu to Earth on September 24. After a seven-year, 4 billion-mile odyssey, the spacecraft still had ample fuel and fully functional instruments.
- Seizing this opportunity, NASA repurposed the spacecraft for the OSIRIS-APEX mission, to capture Apophis' close flyby of Earth in 2029.

**Apophis:**

- Apophis, a stony "S-type" asteroid composed of silicate materials and nickel-iron, differs significantly from the carbon-rich "C-type" Bennu.
- The upcoming encounter with Earth on April 13, 2029, will bring Apophis within 20,000 miles (32,000 kilometers) of our planet, nearer than some geostationary satellites and potentially visible to observers in the Eastern Hemisphere.
- Such close approaches by asteroids of Apophis' size, approximately 367 yards (340 meters) in diameter, are estimated to occur only once every 7,500 years.

**OSIRIS-APEX mission:**

- The OSIRIS-APEX mission aims to observe the physical changes induced by Earth's gravitational pull during Apophis' flyby.
- These changes could include alterations in the asteroid's orbit, rotation speed, and surface features such as quakes or landslides.
- Before its historic meeting with Apophis, OSIRIS-APEX will undergo a series of close solar passes and gravity assists from Earth to align its trajectory.

**SOCIAL ISSUE**

**ARE CRIMES AGAINST WOMEN ON THE RISE?**



**Why in news?**

- The crime rate may have declined in 2022 (258.1 per lakh population compared to 268 per lakh population in 2021), but crimes against women rose 4% in 2022 compared to 2021, according to the annual report of the National Crime Records Bureau (NCRB) released recently.

**Nature of crime:**

- The majority of crimes against women were of cruelty by husband or his relatives (31.4%), kidnapping and abduction of women (19.2%), assault on women with intent to outrage her modesty (18.7%) and rape (7.1%).
- Further, 13,479 cases were registered under the Dowry Prohibition Act.

**What does an increase in the registration of crimes against women indicate?**

- The NCRB's report reveals that over 4.45 lakh cases of crimes against women were registered in 2022, equivalent to nearly 51 FIRs (first information report) every hour.
- The rate of crimes against women per lakh population stood at 66.4 while the filing of charge sheets in such cases was pegged at 75.8. The high crime rate is an indicator of the persistent "lower status and inequality" faced by women and girls.
- With 14,247 cases in 2022, Delhi recorded the highest rate of crimes against women in the country at 144.4 per lakh, way above the country's average rate of 66.4.
- Experts believe the higher numbers show that more cases are being registered in Delhi. In contrast, in many other parts of India, the registration of crime is low and the fear of the police high.
- Women in many States, particularly in the rural areas, would not even visit a police station unaccompanied by a male relative, let alone register an FIR for sexual harassment or domestic violence.

**What are the key laws for women's safety?**

- Some of the key laws for women's safety in India are:
  - The Immoral Traffic (Prevention) Act, 1956,

- The Dowry Prohibition Act, 1961,
- The Commission of Sati (Prevention) Act, 1987,
- Protection of Women from Domestic Violence Act, 2005,
- The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 and
- The Indecent Representation of Women (Prohibition) Act, 1986.

**Concerns:**

- The implementation faces dual problems of shoddy investigation by police and time taken by courts to deliver justice.
- There is a severe lack of police officers with requisite training for investigations. Most of the investigating officers are juniors with a poor pay scale. This hampers the actual investigation and preparation of chargesheets, she points out.
- When it reaches the courts, at trial courts which are the first step, the cases take four to five years. If there is an appeal, it takes another 10-15 years. Despite fast-track courts for looking into grievous crimes, the fact is they remain as slow as ever. There is no seriousness in dealing with the crime.

**Representation of women in the police force:**

- While women police officers are involved in all crimes against women, their proportion in the force is dismal and the rate of their recruitment is very slow in all States without exception. This also causes disproportionate levels of workload on women police personnel leading to slower rates of charge-sheeting and convictions.
- The representation of women in the police force (as of January 1, 2022) remained at 11.7% of the total state police force. This puts undue stress on the limited workforce leading to a high pendency.

**CAN BIHAR INCREASE ITS RESERVATION POOL?**



**Why in news?**

- Recently, the Governor of Bihar approved two laws increasing the quantum of reservations in jobs and education in the State to 75%, including 20% for Scheduled Castes, 2% for Scheduled Tribes, 18% for

Other Backward Classes, and 25% for Extremely Backward Classes, and 10% for economically weaker sections (EWS).

- The two laws have once again sparked debate around the permissible limits of reservations in India, particularly in view of the "50%" limit prescribed by the Supreme Court of India in the Mandal Commission case (Indra Sawhney, 1992), as well as the court's emphasis on "adequate" representation of the oppressed classes as opposed to "proportionate representation".

### What is the 50% rule?

- The Supreme Court has historically maintained that reservations, whether in jobs or education, should not exceed 50% of the total seats/posts.
- In 1963, a seven judge bench in M.R. Balaji explained that reservations were in the nature of an "exception" or "special provision" under our constitutional scheme. Therefore, they cannot be provided for more than 50% of the posts or seats.
- Though this understanding of reservations changed in 1976, the 50% limit has remained unaltered.
- A nine judge bench in the Mandal commission case in 1990 reaffirmed the 50% limit and held that it is a binding rule, and not merely a matter of prudence. However, it is not a rule without exceptions.
- A State can exceed the limit in exceptional circumstances, that is, to provide reservations to communities which hail from far flung areas of the country and have been kept out of the mainstream of the society. This is not a geographical test but a social one.
- Besides, in 2022 the Supreme Court upheld the 103rd Constitutional Amendment which provides for 10% additional reservations to the EWS. This means, for the time being, that the 50% limit applies only to non-EWS reservations, and States are permitted to reserve a total of 60% of the seats/posts including EWS reservations.

### What do laws in Bihar state?

- In January 2023, the Bihar government announced a caste based census/survey to be conducted across the State. The results of this Census were announced in October. Shortly thereafter, the two Bills (now laws) were introduced in the Legislative Assembly.

### Two striking aspects of these laws deserve to be noticed:

- The first is the obvious breach of the 50% (now 60%) ceiling limit. If and when the laws are challenged in court, the government of Bihar will have to prove that there case falls within the exception carved out in the Mandal Commission case. That is, the communities to whom reservations have been granted hail from far flung areas or have been kept out of the social mainstream.

- The second is the justification offered by the State government for this breach. Chief Minister Nitish Kumar expressly stated on the floor of the House that the intent is to increase the quantum of reservations in view of the results of the caste Census.
- However, the Supreme Court has repeatedly held that the State cannot fix the quantum of reservation simply in proportion to the population of the reserved classes.
- This is because the only valid aim behind reservations is to secure "adequate" representation of the depressed classes, which is different from "proportionate" representation. Therefore, one major challenge before the State government will be to defend the motive behind the move.

### Similar instances in other states:

- Bihar is not the first to cross the line. Other States that have already surpassed the 50% limit, even excluding the EWS quota, are Chhattisgarh (72%), Tamil Nadu (69%, under a 1994 Act protected under the ninth Schedule of the Constitution), and several north-eastern States including Arunachal Pradesh, Meghalaya, Mizoram and Nagaland (80% each).
- Lakshadweep has a whopping 100% reservations for Scheduled Tribes. Previous attempts by Maharashtra and Rajasthan have been struck down by the courts.

### What's next?

- The Bihar Government appears to be following the footsteps of other States that have already breached the 50% ceiling limit.
- It seems inevitable that the validity of the two Bihar laws will be carried to the Supreme Court, and the Court will be urged to reconsider the 50% ceiling limit entirely. It remains to be seen whether the court will be inclined to do so.

## WOMEN EMPOWERMENT UNDER DEENDAYAL ANTYODAYA YOJANA – NATIONAL RURAL LIVELIHOODS MISSION



### Why in news?

- Recently the Union Minister of State for Rural Development, in a written reply in Lok Sabha discussed women empowerment under Deendayal Antyodaya Yojana.

**DAY – NRLM:**

- The Ministry is implementing Deendayal Antyodaya Yojana – National Rural Livelihoods Mission (DAY – NRLM) across the country (except Delhi & Chandigarh).
- The objective is to organizing the rural poor women into Self Help Groups (SHGs) and continuously nurturing and supporting them till they attain appreciable increase in incomes over a period of time and improve their quality of life and come out of abject poverty.
- The Mission has mobilized 9.89 crore women from rural households into 89.82 lakh SHGs as on 30th November, 2023.

**Financial support:**

- Under DAY-NRLM, SHGs and their federations are empowered by providing them funding support in the form of Revolving Fund (RF) and Community Investment Fund (CIF).
- In addition, the SHGs are also facilitated for Bank linkage for accessing credit at subsidized rates of interest.
- SHG member are taking loan from these funds for taking up various income generating activities.

**Livelihoods activities:**

- The Mission also helps SHG households for taking up livelihoods activities in rural area through various interventions through sub-schemes like Start-up Village Entrepreneurship Programme (SVEP), Aajeevika Grameen Express Yojana (AGEY), Mahila Kisan Sashaktikaran Pariyojana (MKSP), Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDUGKY) & Rural Self Employment Training Institutes (RSETI).

**Significance:**

- DAY NRLM has played a significant role in transforming the lives of rural poor, especially women.
- It has contributed to increase in savings, reduction in share of informal loans, improved labour force participation of women, significant improvement in access to other social sector schemes and a significant improvement in households' income sources.

**Interventions are being taken made to address the unique challenges faced by marginalized communities in rural areas:**

- a) All rural households with at least one deprivation, as identified by the Socio-Economic Caste Census (SECC-2011), form the target group of DAY-NRLM. In addition, households identified as poor through the process of Participatory Identification of the Poor (PIP) and duly validated by the Gram Sabha are also included as the DAY-NRLM target group.
- b) The Mission has special focus on early inclusion of the Scheduled Castes, Scheduled Tribes, persons with disability, elderly, poorest of the poor and other

vulnerable sections of community into SHG fold under DAY-NRLM through participatory vulnerability assessment processes as part of social mobilization in the States/UTs.

- c) Provision of Vulnerability Reduction Fund (VRF) up-to Rs. 1,50,000 per Village Organization (VO). This is a corpus fund given to VO/Primary Level Federation at Village level to address vulnerabilities faced by the individuals or household(s) or communities.
- d) Special projects have been sanctioned for inclusion and comprehensive development of Particularly Vulnerable Tribal Groups (PVTGs) communities of Kerala, Jharkhand and Chhattisgarh and for socio-economic development of Vantangiya and Banwariya marginalized communities in UP.
- e) The innovative approach towards skill development is establishment of RSETIs, the district-level Rural Self Employment Training Institutes managed by the Banks with active co-operation from the Ministry of Rural Development (MoRD), Government of India and State Government.
- These dedicated institutions ensure necessary skill training of the rural youth to mitigate the unemployment problem. The Lead Bank in the district takes responsibility for creating and managing the RSETI. At present, 591 RSETIs are functioning across 577 districts.

**DDU-GKY:**

- The Ministry is also implementing Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY), a placement-linked skill development program to build the capacity of rural poor youth of the age-group 15 to 35 years.
- This programme is being implemented since September 2014 to address the needs of domestic and global skill requirements. So far, 15,59,438 candidates have been trained under DDU-GKY.

**GOVERNMENT AIMS TO SET UP 17,000 CRECHES ACROSS INDIA**



**Why in news?**

- The Women and Child Development Ministry aimed to establish 17,000 creches in anganwadis across the country.

**'Palna' scheme:**

- 5,222 creches had been approved until now, and it planned to depute two additional creche workers in each anganwadi.
- These initiatives are being taken under the 'Palna' scheme to address the need for quality daycare facilities or creches for children of working women by providing a safe and secure environment for the nutritional, health and cognitive development of the children, thereby enabling more women among all socio-economic groups to take up gainful employment in the organised and unorganised sector.

**New SOP:**

- Recently, Union Women and Child Development Minister released a new Standard Operating Procedure (SOP) for anganwadi-cum-creche centres being set up under the 'Palna' scheme.
- They outline a comprehensive framework for the administration and implementation of the scheme, including administrative hierarchy, roles, and responsibilities of the workers and monitoring checklist.
- Two additional creche workers and helpers would be deputed along with the existing anganwadi workers and helpers.

**Significance:**

- According to government data, participation of women in the workforce has increased to 37% in 2022.
- As of March 31, 2021, 13.87 lakh anganwadi and mini-anganwadi centres are operational across the country.

**HEALTH****INDIA RECORDED MOST MALARIA CASES IN SOUTH & SOUTHEAST ASIA IN 2022, WHO****Why in news?**

- According to World Malaria Report 2023, India accounted for 66 per cent of the 5.2 million malaria cases recorded in 2022, the highest for any country in the South East Asia region of the World Health Organization (WHO).

- This is even as cases reduced by at least 55 per cent in India since 2015, where the disease is endemic.
- Climate change can directly interact with the sensitivity of the malaria pathogen and the vector (female Anopheles mosquito) to temperature, rainfall and humidity, and make it easier for the contagion to spread and infect.

**Global scenario:**

- A total of 249 million cases were recorded in 2022. This was five million more than the previous year and significantly more than 2019, which is considered a benchmark year.
- Pakistan recorded the largest rise in cases in 2022 compared to 2021, with 2.1 million additional malaria infections. It was followed by Ethiopia, Nigeria, Uganda and Papua New Guinea.
- India, along with Indonesia, also accounted for 94 per cent of all the deaths that occurred due to malaria in 2022.
- The South East Asian region, overall, accounted for only 2 per cent of the global malaria burden and managed to contain the disease in the last two decades, the authors of the report observed. Since 2000, total malaria cases as well as deaths in the region dropped by 77 per cent from 22.8 million and 35,000 respectively, they added.
- Apart from India, Bangladesh, Bhutan, the Democratic People's Republic of Korea, Nepal, Thailand and Timor-Leste also managed to reduce their malaria incidence by 55 per cent or more since 2015.
- Of them, Bhutan (for the first time), Timor-Leste (for the second time) and Sri Lanka reported zero malaria cases in 2022. Nepal, for the first time, didn't record a single indigenous malaria death.
- The trend was reversed in Myanmar, however, where cases increased seven times from 2019-2022, from 78,000 to 584,000 "fueled by political and social instability.
- Africa was the worst-hit, with 94 per cent of all malaria cases (233 million cases) and 95 per cent global malaria deaths (580,000 deaths) in 2022. About 78 per cent of all malaria deaths in the Region were among children under the age of five.

**Climate change major health threat:**

- It poses a direct health hazard and also acts as a 'threat multiplier' by impairing healthcare systems and creating financial strains.
- In the case of malaria specifically, meteorological anomalies wrought by climate change can aid disease transmission and exacerbate the global crisis both in the short-term and the long.
- For instance, the ideal mosquito breeding and survival occurs at temperatures ranging from 20-27 degrees Celsius, with mortality increasing above 28°C. Conversely, a slight warming in cooler, malaria-free zones could lead to new malaria cases.

**Natural disasters:**

- Floods, cyclones and other extreme weather events that have been made more intense and frequent by the planetary crisis also lead to outbreak of infectious diseases such as malaria.
- Natural disasters destroy health infrastructure and can cause a breakdown of the supply chain of critical medication, vaccines as well as mosquito nets.
- They also displace people in large numbers. This not only gives rise to socio-economic challenges but also can expose new population groups to the infection by forcing them to move into endemic areas from places where malaria wasn't prevalent.

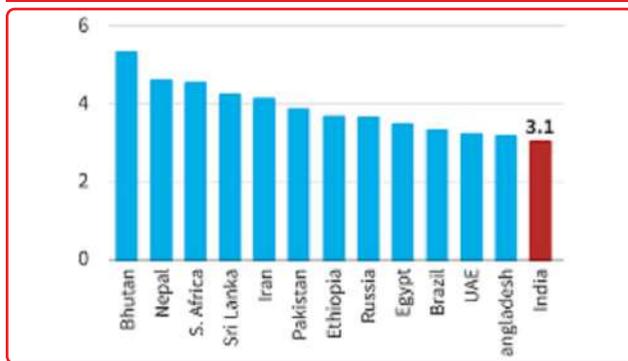
**Containment goals:**

- In the path to malaria eradication, WHO had identified graded targets of reducing case incidence and mortality rates by 75 per cent in 2025 and 90 per cent in 2030.
- The world is 55 per cent off track to reach its 2025 target of reducing malaria case incidence and 53 per cent off track to achieving the 2025 target of reducing malaria fatality rate.
- Without drastic measures, these gaps will widen for the ultimate 2030 goals. Despite this, the funding gap for malaria control grew from \$2.3 billion in 2018 to \$3.7 billion in 2022.
- Funding for research and development saw its steepest fall ever, to \$603 million. This is the lowest in 15 years.

**Way Forward:**

- The WHO called for sustainable and resilient malaria responses that align with efforts to reduce the effects of climate change.

**74 PERCENT INDIANS COULD NOT AFFORD HEALTHY DIET IN 2021, REPORT**



**Why in news?**

- Recently, the Food and Agriculture Organization of the United Nations released a report, titled, "Regional Overview of Food Security and Nutrition 2023: Statistics and Trends".
- The FAO report is a glimpse of the progress in meeting Sustainable Development Goals and World Health Assembly (WHA) global nutrition targets.

- It said that during the pandemic and the "5Fs" crisis – food, feed, fuel, fertilizer, and finance – the Asia Pacific region witnessed harrowing statistics.

**Details:**

- More than 74% of Indians could not afford a healthy diet in 2021. In 2020, the percentage was 76.2.
- In Pakistan, the figure was 82.2% and in Bangladesh, 66.1% of the population faced difficulties in finding healthy food.
- Rising food costs, if not matched by rising income, would lead to more people being unable to afford a healthy diet.

**Key Highlights:**

- It said that 16.6% of the country's population was undernourished. The impacts of undernourishment extend beyond health and nutritional well-being to include economic and social costs.
- The region had a lower prevalence of both moderate or severe and severe food insecurity when compared with the world prevalence since 2015.

**Stunted growth:**

- It said that 31.7% of children in India under the age of five showed stunted growth.
- Stunted growth and development are the result of poor maternal health and nutrition, inadequate infant and young child feeding practices, and repeated infections interacting with a variety of other factors over a sustained period.

**Wasting:** Education Centre

- For wasting (low weight for height), India recorded the highest rate in the region, with 18.7% children under five facing this major health problem.
- Reducing and maintaining childhood wasting to less than 5% is the WHA global nutrition target. 2.8% of children below five were overweight, another health risk.

**Anaemia:**

- It said that 53% of women aged between 15 to 49 in India had anaemia, which was the largest prevalence rate in the region in 2019.
- Anaemia impairs health and well-being in women and increases the risk for adverse maternal and neonatal outcomes. It also said that 1.6% of adults in the country were obese.

**Breastfeeding:**

- On exclusive breastfeeding among infants in the age group of 0-5 months, India had improved the prevalence with a percentage of 63.7%, which is higher than the world prevalence of 47.7%.

**Low birth weight:**

- India had the highest prevalence of low birth weight in the region (27.4%), followed by Bangladesh and Nepal.

### Severe food insecurity in Southern Asia:

- Southern Asia showed higher prevalence of severe food insecurity compared with the other subregions, and it is in Eastern Asia where the lowest prevalence of severe food insecurity was observed.
- Compared with the world, Southern Asia had higher percentages for both moderate or severe and severe food insecurity since 2015.

### URGENT NEED TO CONTROL USE OF E-CIGARETTES, SAYS WHO



#### Why in news?

- E-cigarettes as consumer products are not shown to be effective for quitting tobacco use at the population level. Instead, alarming evidence has emerged on adverse population health effects, the World Health Organization said recently.
- It added there is an urgent need to control e-cigarettes to protect children, as well as non-smokers and minimise health harms to the population.

#### Regulations:

- The WHO said that e-cigarettes have been allowed on the open market and aggressively marketed to young people.
- Thirty-four countries have banned the sale of e-cigarettes, 88 countries have no minimum age at which e-cigarettes can be bought and 74 countries have no regulations in place for these harmful products.
- In India, the possession of e-cigarettes and similar devices is a violation of the Prohibition of Electronic Cigarette Act, 2019.

#### Rising number of users:

- Even brief exposure to e-cigarette content on social media can be associated with increased intention to use these products, as well as more positive attitudes towards e-cigarettes.
- Studies consistently show that young people who use e-cigarettes are almost three times more likely to use cigarettes later in life.
- According to data, children in the age group of 13-15 years are using e-cigarettes at rates higher than that among adults in all WHO regions.

- In Canada, the rates of e-cigarette use among 16 to 19-year-olds has doubled between 2017 and 2022, and in the U.K., the number of young users has tripled in the past three years.

#### Impacts:

- The e-cigarettes with nicotine are highly addictive and are harmful to health.
- While long-term health effects are not fully understood, it has been established that they generate toxic substances, some of which are known to cause cancer and some that increase the risk of heart and lung disorders.
- It can also affect brain development and lead to learning disorders for young people.
- Foetal exposure to e-cigarettes can adversely affect the development of the foetus in pregnant women. Exposure to emissions from e-cigarettes also poses risks to bystanders.

#### Way Forward:

- The urgent measures are necessary to prevent uptake of e-cigarettes and counter nicotine addiction alongside a comprehensive approach to tobacco control, and in light of national circumstances.

### EL NINO EFFECT, CASES OF DENGUE HAVE INCREASED GLOBALLY



#### Why in news?

- There has been a ten-fold increase in dengue cases between the years 2000 and 2019, according to an analysis by the World Health Organization (WHO).
- The reported cases have gone up from 500,000 to 5.2 million during this period.
- The actual number of cases would be higher as the infection is asymptomatic in most cases and it is not a notifiable disease in many countries.

#### Key Highlights:

- There is a sharp increase in cases globally after the lull between the pandemic years 2020-2022. In 2019, when the last spike in cases occurred, the disease was reported in 129 countries.
- In 2023, 80 countries reported over five million cases and more than 5,000 dengue-related deaths.

➤ Between January 1, 2023 and December 11, 2023, a total of 4.1 million suspected dengue cases, including 6,710 severe cases and 2,049 deaths, were reported from 42 countries and territories in the region.

**Regions affected:**

- Active outbreaks were reported from 15 countries in the Americas, with Brazil reporting the highest number of cases, followed by Peru and Mexico.
- In the Southeast Asia region, 10 out of 11 member states are known to be endemic for dengue virus. Bangladesh and Thailand recorded a larger number of cases.
- The Africa region was affected by many arboviral diseases, such as yellow fever, dengue, chikungunya, O'nyong nyong, Rift Valley fever and zika.
- In 2023, outbreaks were reported in 15 of the 47 countries in the African region as well. Burkina Faso with 146,878 suspected cases and 688 deaths among suspected cases was the worst affected.
- WHO's Eastern Mediterranean region first reported dengue cases in 1998. Since then, the virus has spread to nine countries. Pakistan, Saudi Arabia and Oman have reported the highest number of confirmed cases thus far in 2023.
- The European Region was not affected much and earlier cases used to be mainly travel-related. However, since 2010, the disease has established itself in the region. In 2023, cases and outbreaks have been reported in three countries: Italy, France and Spain.
- In 2023, the Western Pacific Region has reported over 500,000 dengue cases and 750 deaths. The most affected countries are the Philippines and Vietnam. Among the Pacific Island countries, Fiji is the worst affected.

**Factors responsible:**

- In 2023, the upsurge can be linked to the changing distribution of the vectors (chiefly Aedes aegypti and Aedes albopictus); increase in temperature and changes in rainfall patterns due to the El Nino climate phenomenon; fragile health systems after the pandemic, political and financial instabilities in countries; and high population movements.

**Dengue:**

- Dengue transmission is cyclic and large outbreaks occur every 3-4 years. Four serotypes of the virus (DENV-1, DENV-2, DENV-3, DENV-4) are present.
- There is no specific treatment for dengue, but severe cases and mortality can be prevented with timely diagnosis and appropriate clinical management.

**Way Forward:**

- There is an urgent need to increase advocacy and resource mobilisation.
- A Global Joint Incident Management Support Team has been established involving the WHO Health Emergencies Programme (Response and

Preparedness departments) and technical expertise from the neglected tropical disease department to support the response to outbreaks.

**INDIAN RESEARCHERS IDENTIFY GENE THAT HELPS TB BACTERIUM SURVIVE IN HUMAN BODY**

**Why in news?**

- Researchers at the Indian Institute of Science (IISc) have made a significant discovery in the fight against tuberculosis (TB).
- They have identified a gene that plays a crucial role in the survival and persistence of Mycobacterium tuberculosis (Mtb) within the human host.

**Focus:**

- The research team focused on understanding how Mtb can remain dormant in the body for extended periods.
- They explained that while the immune system can often detect and eliminate Mtb, the bacterium has developed ways to hide and persist in oxygen-poor regions of the lungs, evading both the immune response and TB medications.

**Details:**

- They cultivated Mtb in a Bio Safety Level-3 facility at IISc's Center for Infectious Disease Research, examining the bacterium's reliance on iron-sulphur clusters.
- These clusters are vital for various cellular processes, including respiration and energy production, which enable Mtb to survive the hostile environment of the lungs and cause infection.

**Key observations:**

- They discovered that the production of these iron-sulphur clusters is primarily controlled by a single gene known as IscS under normal and low-oxygen conditions.
- However, when the bacterium is under oxidative stress, another set of genes, the SUF operon, is activated to meet the increased demand for new clusters.
- By creating a mutant Mtb strain lacking the IscS gene, the team observed that its absence led to a severe form of the disease in mouse models, rather than the typical persistent, chronic infection.
- This suggests that the IscS gene regulates the SUF operon, maintaining a balance that allows the bacterium to persist in the host.
- Furthermore, the mutant bacteria were found to be more susceptible to certain antibiotics, indicating potential new avenues for treatment.
- The researchers propose that targeting the IscS and SUF systems with a combination of antibiotics might enhance treatment efficacy.

**Way Forward:**

- This discovery not only sheds light on the mechanisms of TB persistence but also opens up possibilities for developing therapies aimed at eradicating the disease.
- With continued research, the insights gained from the IISc study could eventually lead to the elimination of TB as a global health threat

**CULTURE****WHY HAS A SURVEY BEEN APPROVED AT THE SHAHI IDGAH?****Why in news?**

- The Shahi Idgah, a three-domed mosque, in Mathura will be surveyed following the decision of the Allahabad High Court.
- It permitted an application seeking appointment of a court commission to inspect the Shahi Idgah mosque that stands adjacent to the Krishna Janmabhoomi temple in Mathura.

**Details:**

- The order of inspection of the Shahi Idgah was pronounced by Justice Mayank Kumar Jain who maintained that "during the execution of the commission, the sanctity of the campus can be directed to be maintained strictly."
- The plea for a survey was filed on behalf of the Hindu deity, Shri Krishna and seven others, who in their original suit pending before this court claimed that the mosque was built over the birthplace of Shri Krishna on the orders of Mughal emperor Aurangzeb in 1670.
- Since the Babri Masjid judgment in 2019, nine cases related to the Shri Krishna Janmabhoomi and Shahi Idgah Masjid, have been filed in the Mathura court.
- Earlier in May 2023, the Allahabad High Court transferred to itself all the suits pending before the Mathura Court on various reliefs pertaining to the Sri Krishna Janmabhoomi-Shahi Idgah Mosque dispute.

**What does the Masjid maintain?**

- The lawyers of the U.P. Sunni Central Waqf Board and the Shahi Idgah Masjid Committee contended in the

High Court that "the Shahi Idgah Masjid does not fall within the ambit of 13.37 acres land at Katra Keshav Dev" and that the "place of birth of Lord Krishna does not lie beneath the Mosque.

- The claim of plaintiffs is based on guess work and is not substantiated by any documentary evidence."
- When the Committee of Management Trust of the Shahi Idgah Masjid approached the Supreme Court for a stay on the survey, the apex court did not provide any relief.

**What does Places of Worship Act say?**

- Even as the modalities of the survey are being worked out, the mosque committee maintains that the Places of Worship (Special Provisions) Act, 1991 prohibits changing the character of any place of worship as it existed on August 15, 1947.
- In 2020, Lucknow-based Vishwa Bhadra Pujari Purohit Mahasangh had filed a petition in the Supreme Court to declare Section 4 of the 1991 Act ultra vires, saying that "the impugned Act has barred the right and remedy against encroachment made on religious property of Hindus exercising might of power by followers of another faith."
- In the M. Siddiq versus Suresh Das case, popularly called the Babri Masjid-Ramjanmabhoomi verdict, the apex court had held that the Places of Worship Act, imposed a non-derogable obligation towards enforcing our commitment to secularism, under the Constitution.

**What is the history of the land?**

- The survey has been ordered as the Hindu representatives demand complete ownership of the premises where the Keshava Deva temple was destroyed on the orders of Mughal emperor Aurangzeb in 1670.
- The temple had been built in 1618 during the reign of Aurangzeb's grandfather Jahangir by Bir Singh Bundela. The temple had been patronised by Aurangzeb's brother and rival for the Mughal throne, Dara Shukoh.
- Later, in 1815, Raja Patni Mal of Benaras bought the 13.77 acre-land from the East India Company. His descendants sold the land to Jugal Kishore Birla for ₹13,400, who then set up the Shri Krishna Janmabhoomi Trust.
- It acquired ownership rights over the temple and in 1951, the 13.77 acre-land was placed in the trust, with the condition that the "trust property will never be sold or pledged."
- In 1968, an agreement was signed between the Sri Krishna Janmasthan Seva Sangh and the Shahi Idgah Masjid Trust. As part of the settlement, the temple authority had conceded a portion of the land to the Idgah. Now, the temple petitioners want possession of the entire parcel of the land.

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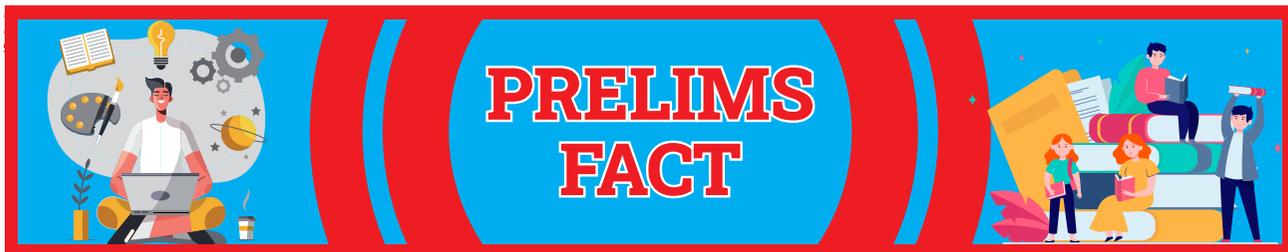
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## POLITY & GOVERNANCE

### JHARKHAND GOVERNOR CLEARS BILL HAVING PROVISION OF LIFE TERM FOR CHEATING IN EXAMS



#### Why in news?

- Jharkhand Governor recently approved the Jharkhand Competitive Examination (Measure for Control and Prevention of Unfair Means in Recruitment) Bill, 2023, which mandates a strict provision of life imprisonment and fine up to ₹10 crore, in case of cheating in competitive examinations.

#### Salient features:

- According to the provision, if a person is caught for the first time, there will be a fine of ₹5 lakh and one year imprisonment, if not paid, it will lead to an additional punishment of nine months' imprisonment.
- If caught for a second time, he/she will be fined ₹10 lakh and given three years of imprisonment.
- If this is not paid, it will lead to an additional sentence of 30 months. If found guilty, an examinee will not be allowed to sit in any competitive exam for 10 years.
- According to the Bill, if a printing press, the management system that conducts an examination, the person engaged in transport, or coaching institutes play the role of conspirator then the punishment can range from 10 years to life imprisonment.
- There is also a provision to impose a fine ranging from ₹2 crore to ₹10 crore.
- Failure to pay the penalty will result in an additional three years of prison sentence.

#### FIR not allowed

- Clause 11 (2) of the Bill prohibits filing FIR by candidates, and print, electronic and social media representatives

who raise questions regarding question papers and answer sheets related to the examination.

### CENTRE AGREES TO EXAMINE DEMANDS FOR LADAKH SAFEGUARDS



#### Why in news?

- The Union Home Ministry has agreed to examine the demand of civil society groups in Ladakh to provide "constitutional safeguards" for the Union Territory.

#### Committee constituted:

- The key detail is mentioned in an order issued by the Ministry to reconstitute a high-powered committee for Ladakh.
- The 22-member panel, chaired by Minister of State for Home Nityanand Rai, will have representatives from both Kargil and Leh divisions.
- The panel is expected to hold its first meeting in Delhi on December 4.

#### Terms of reference:

- The terms of reference of the committee are to discuss measures
  - to protect the region's unique culture and language taking into consideration its geographical location and strategic importance; to ensure protection of land and employment for people of Ladakh;
  - to discuss measures for inclusive development and employment generation in the region,
  - to discuss measures related to the empowerment of the Ladakh Autonomous Hill District Councils of Leh and Kargil; and
  - to examine constitutional safeguards that could be provided to ensure the measures and protection detailed above.

#### Background:

- Ladakh has erupted in protests several times since it was carved out of Jammu and Kashmir in 2019.

- Civil society organisations have been demanding Ladakh's inclusion in the Sixth Schedule of the Constitution and granting tribal status to the Union Territory.

**RS PASSES POST OFFICE BILL TO AMEND 125-YEAR-OLD INDIAN POST OFFICE ACT**



**Why in news?**

- The Rajya Sabha recently passed the Post Office Bill, 2023 that seeks to repeal the 125-year-old Indian Post Office Act and consolidate and amend the law relating to post offices in the country.
- The Bill was introduced in the Rajya Sabha during the Monsoon Session of Parliament.

**Key Highlights:**

- It seeks to replace the colonial-era Indian Post Office Act of 1898 that has governed India's postal services for 125 years.
- The enactment is with a view to govern the functioning of the post offices in the country and provide for a simple legislative framework to facilitate the evolution of the post offices into a network for delivery of citizen-centric services.
- The new bill introduces a range of changes, redefining the role of the central government, empowering the Director General of Postal Services, and addressing key aspects such as interception of postal articles, liability exemptions, and the removal of certain offences and penalties.

**Contentious provision:**

- The contentious provision in the bill allows the central government, through notification, to empower officers to intercept, open, or detain items for reasons related to national security, public order, emergency, or contravention of prevailing laws.
- The existing Indian Post Office Act of 1898 also provides for interception, albeit with some differences. Section 26 of the Act empowered the central government, state government, or a specially authorized officer to issue a written order for the interception, detention, or disposal of any postal article or a specific class or description of postal articles.

- This authority was granted "on the occurrence of any public emergency or in the interest of public safety or tranquillity." In cases of uncertainty regarding whether an action constituted a public emergency or was in the interest of public safety, a certificate from the relevant government was necessary.
- In contrast, the new Post Office Bill, under clause 9, removes the requirement for a written order for interception. The central government is now empowered to intercept, open, or detain any item without the necessity of issuing a written order.

**Liability:**

- The bill exempts the government and officers from liability related to the loss, mis-delivery, delay, or damage to postal articles.
- However, it introduces the provision that the central government may prescribe liability with regard to services by India Post under the rules.

**SC HOLDS ARBITRATION DEALS IN UNSTAMPED CONTRACTS TO BE VALID**



**Why in news?**

- A seven-judge Constitution Bench recently held that arbitration agreements embedded in unstamped or insufficiently-stamped substantive commercial contracts or instruments are not invalid, unenforceable or even non-existent.

**Why it matters?**

- The Supreme Court judgment gives a significant shot in the arm for India's ambition to become an international arbitration hub to quickly resolve commercial disputes.
- Earlier, arbitrations on such disputes had struck a roadblock owing to non-payment of the required stamp duty for or insufficient stamping of contracts by the parties.
- Arbitration aims to provide speedy, efficient, and binding resolution of disputes that have arisen between the parties in regard to their substantive obligations.

**Highlights of the judgement:**

- Delivering the lead opinion in a curative petition overruling an earlier five-judge Bench verdict of the

Supreme Court in the N.N. Global case, Chief Justice of India D.Y. Chandrachud held that “non-stamping or inadequate stamping is a curable defect”.

- The Chief Justice clarified that arbitration agreements would not be non-existent, unenforceable, or invalid if the underlying contract was not stamped.
- The judge said non-payment or insufficient stamping of contracts under the Stamp Act would not affect arbitration proceedings under the Arbitration Act. Such contracts were only inadmissible in evidence under the Stamp Act.

#### Self-contained code:

- Arbitration Act is a self-contained code. Accordingly, matters governed by the Arbitration Act such as the arbitration agreement, appointment of arbitrators and competence of arbitral tribunal to rule on its jurisdiction have to be assessed in the manner specified under the law.
- Therefore, provisions of other statutes (Stamp Act) cannot interfere with the working of the Arbitration Act, unless specified otherwise.
- The court said an arbitration agreement is presumed to have separate existence from the contract.

### RAJYA SABHA PASSES CENTRAL UNIVERSITIES (AMENDMENT), BILL, 2023

**THE CENTRAL UNIVERSITIES (AMENDMENT) BILL, 2023**

**PASSED BY PARLIAMENT**

**Big Push to Tribal Education**

- Amendment to the Central Universities Act, 2009 to set up Sammakka Sarakka Central Tribal University in Telangana
- New University will improve access & quality of higher education.
- New University will remove regional imbalances.
- Advance research in tribal art, culture and traditional knowledge systems for peoples benefit.

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#### Why in news?

- The Rajya Sabha recently passed the Central Universities (Amendment), Bill, 2023 further to amend the Central Universities Act, 2009 for establishment Sammakka Sarakka Central Tribal University at Mulugu in the State of Telangana.
- The Bill was passed by the Lok Sabha on 7th December, 2023.

#### Key Highlights:

- The University will be established at a cost of Rs. 889.07 crore. In the University, there will be graduate, postgraduate and Doctoral level courses under the five schools having 11 departments.
- A total of 2790 UG and PG students are proposed for the initial seven years of operation of this Tribal University.
- The establishment of this University will create direct employment in the form of faculty and non-faculty positions. Besides, it will also create employment avenues through outsourcing/ contractual basis.
- It will result in developing surrounding areas through several services and commercial activities which in turn will generate indirect employment opportunities.

#### Named after:

- The University has been named “Sammakka Sarakka Central Tribal University” on the mother and daughter, Sammakka and Saralamma (commonly known as Sarakka), who are believed to be manifestations of Adi Parashakti sent to protect the tribal communities of Telangana.

### SCHOOL OF HAPPINESS TO TAKE ROOT IN ASSAM



#### Why in news?

- A first-of-its-kind school for imparting lessons on humanity and societal happiness will take root in the Bodoland Territorial Region (BTR) of Assam at the dawn of 2024.

#### Details:

- The foundation of the International School of Peace and Happiness is scheduled to be laid in the first week of January at Bijni in Chirang district of western Assam, one of five in the BTR.
- The project would be initiated after a year of planning by the Bodoland Territorial Council (BTC), which administers the BTR.

#### Background:

- The BTR areas have had a history of extremism resulting in ethnic conflicts, especially between the Bodos, the largest plains tribe in the northeast,

and migrant Muslims, and between the Bodos and Adivasis.

- Hundreds were killed and more than 500,000 people were displaced in major communal clashes in 1993, 2008, and 2012.
- The idea of a school specialising in peace-building and spreading happiness had germinated since the United People's Party Liberal, formed the BTC government with the BJP and the Gana Suraksha Party three years ago.

**Bodoland Happiness Mission:**

- The school of happiness had its genesis in a pilot project called Bodoland Happiness Mission introduced almost a year ago.
- Some 400 youth and community leaders were chosen to become peace and happiness volunteers after undergoing a few weeks of training at the Bodoland Community Counselling Centres.
- Each district has one such strategically located centre.

**HOUSE PANEL PULLS UP CENTRE OVER DELAY IN FRAMING RULES FOR ACTS PASSED BY PARLIAMENT**



**Why in news?**

- The Subordinate Legislation Committee of the Rajya Sabha, headed by BJP MP Laxmikant Bajpayee, has pulled up the Centre for the delay in framing of rules/regulations for the Acts passed by Parliament.

**Key Highlights:**

- The panel said that delay by the Union Ministries in the framing of rules has become a recurring problem.
- Framing rules, a duty of the Executive, is supposed be done within six months of passing the Act, and the government must table the rules of an Act in Parliament.
- On the National Food Security Act of 2013, the report said even after the Act came into force about 10 years ago, the rule-making process had been stuck up, especially on the part of State governments. Delhi, Rajasthan and Uttarakhand are yet to complete the process.

- Similarly, on the rules of Arbitration and Conciliation (Amendment) Act, the panel said four years had lapsed without any progress when so much importance was being given to ease of doing business.

**Concerns:**

- The Committee feels that the delay in framing the rules/regulations defeats the very purpose of enactment of the Acts as the Acts cannot be operated in the absence of the Rules/Regulations.
- It also cited its 1971 report that said if the rules were not framed within six months, the Secretary should inform the Minister concerned and obtain his orders.

**PMLA ACCUSED CAN BE GIVEN COPY OF GROUNDS OF DETENTION WITHIN 24 HOURS, SC**



**Why in news?**

- The Supreme Court has clarified in a judgment that the Enforcement Directorate (ED) need not furnish a person accused under the Prevention of Money Laundering Act (PMLA) with a copy of the grounds of detention at the time of his arrest.

**Details:**

- The judgment comes amid debate that non-communication of the grounds of arrest was a violation of Article 22(1) of the Constitution, which upholds the fundamental right of any person who is in custody to be informed as to why he has been arrested.
- A Bench headed by Justice Bela M. Trivedi held that the written communication of the grounds of arrest need to be provided only within a "reasonable period" of the arrest, that is, within 24 hours of the arrest.

**Key Highlights:**

- It held that the recent judgment in Pankaj Bansal vs Union of India, which held that the ED must furnish the grounds of arrest in writing at the time of arrest, does not apply retrospectively.
- Therefore, the bench of Justices held that arrests that were made without furnishing grounds of arrest before October 3, 2023 cannot be illegal.
- The bench added that the accused needs to be furnished with the written grounds for arrest within

24 hours of arrest, but must be orally informed about them at the time of arrest.

- Section 19 of the Prevention of Money Laundering Act (PMLA) states that the accused must be informed of the grounds of arrest “as soon as may be”, which the bench said should be construed “as early as possible without avoidable delay” or “within reasonably convenient” or “reasonably requisite” period of time.

**What's next?**

- The bench's refusal to accept that Pankaj Bansal is retrospective is significant given that various high courts have taken different views on this issue.
- The Punjab and Haryana high court held it to be retrospective while the Bombay high court did not.
- The Supreme Court dismissed the appeal filed by Supertech chairman Ram Kishor Arora challenging the Delhi high court's order affirming his arrest by the ED in a money laundering case.

**GOVT PLANS FACE AUTHENTICATION FOR MGNREGS ATTENDANCE**



**Why in news?**

- The Union government is planning to introduce face authentication to mark attendance of workers under the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) from early 2024.

**Details:**

- The move comes almost a year after the Centre made digital capturing of attendance under MGNREGS universal, starting 1 January 2023.
- The Union Rural Development Ministry has asked all state governments and Union territories to test the new feature and prepare for its implementation.
- The face authentication or recognition feature has been included in the National Mobile Monitoring System (NMMS) app.

**Facial recognition:**

- Under the new feature, a worker's face will be scanned and matched against their Aadhaar data with the Unique Identification Authority of India (UIDAI) for authentication.
- The worker's face will subsequently be scanned for attendance whenever he/she reports to work.

- Facial recognition is currently being used by some state governments such as Telangana and Karnataka for disbursement of pension, and marking attendance of officials, issuing drivers' licence etc.
- It is also a feature in DigiYatra, the biometric and contactless security clearance system rolled out at some airports.

**Genuine beneficiaries:**

- One of the biggest challenges in the implementation of the MGNREGS has been ensuring that the workers present at a job site are genuine beneficiaries.
- In 2022-23, 5.18 crore names of workers were deleted from MGNREGS, according to a response by the ministry to a Parliament question in July.
- The reasons for deletions included fake and duplicate job cards, apart from others such as beneficiaries shifting out.

**Pilot project in Haryana:**

- For the implementation of the new technology, states will have to train their field staff and MGNREGS mates, who are responsible for taking attendance, and also assist them in upgrading their mobile phones (mates use their own phones) in using this sophisticated technology.
- The pilot was tested in Haryana's Fatehabad in October 2023, and the state government is using face authentication in the district's Tohana block at present.

**LS PASSES BILLS TO REPLACE BRITISH-ERA CRIMINAL LAWS**

**Understanding the 3 bills**

<p><b>Indian Penal Code (IPC), 1860</b></p> <p>↓ REPLACED BY</p> <p><b>Bharatiya Nyaya Sanhita (second) Bill, 2023</b></p> <p>It will have 358 sections (instead of 511 sections in IPC)</p>	<p><b>Code of Criminal Procedure (CrPC), 1973</b></p> <p>↓ REPLACED BY</p> <p><b>Bharatiya Nagarik Suraksha (second) Sanhita, 2023</b></p> <p>It will have 531 sections (instead of 484 sections in CrPC)</p>	<p><b>Indian Evidence Act, 1872</b></p> <p>↓ REPLACED BY</p> <p><b>Bharatiya Sakshya (second) Bill, 2023</b></p> <p>It will have 170 sections (instead of 166 sections in IEA)</p>
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**What the laws seek to do**

- Introduce changes dealing with offences of terrorism and acts against the State
- Allow the registration of e-FIRs
- Factor in corruption in the election processes
- Make electronic evidence a form of primary proof
- Separately define crimes like mob lynching for the first time
- Include detailed provisions and enhanced punishment for crimes against women and children

**“The new laws have been framed keeping in mind three basic principles -- civil liberty of citizens, human rights and equality. Some are unable to visualise this. The current (British) laws have no scope for justice — punishment is seen as justice.” — AMIT SHAH**



**Why in news?**

- The Lok Sabha passed three amended Bills that seek to repeal and replace criminal laws which date back to colonial times.
- This criminal law reform brings terrorism offences into a general crime law for the first time, drops

the crime of sedition, and makes mob lynching punishable by death.

**Details:**

- The Bharatiya Nyaya (Second) Sanhita Bill (BNSS) will replace the Indian Penal Code, 1860; the Bharatiya Sakshya (Second) Bill (BSS) will replace the Indian Evidence Act, 1872; and the Bharatiya Nagarik Suraksha (Second) Sanhita Bill (BNSSS) will replace the Code of Criminal Procedure, 1898.
- All three were discussed and passed with a voice-vote, in the absence of the majority of Opposition members from INDIA bloc parties, as 97 of them have been suspended during this session.

**Bharatiya Nagarik Suraksha (Second) Sanhita, 2023:**

- CrPC had 484 sections, now the Bharatiya Nagarik Suraksha (Second) Sanhita, 2023 will have 531 sections; 177 sections have been changed; 9 new sections and 39 sub-sections have been included; 44 new explanations have been added; timelines have been added in 35 sections; and 14 sections have been repealed.

**Bharatiya Nyaya (Second) Sanhita:**

- The IPC had 511 sections, and the Bharatiya Nyaya (Second) Sanhita will have 358 sections; 31 new offences have been included in the purview of the new law; the imprisonment period has been increased for 41 offences; penalty has been hiked in 82 offences; compulsory minimum punishment has been introduced in 25 offences; community service has been added as a penalty for 6 offences; and 19 sections have been repealed.

**Bharatiya Sakshya (Second) Bill, 2023:**

- The Bharatiya Sakshya (Second) Bill, 2023 has 170 sections as compared to 167 sections in the Indian Evidence Act; 24 sections have been changed; two new sections have been added; and six sections have been repealed.

**LOK SABHA PASSES TELECOM BILL 2023 TO REPLACE 138-YEAR-OLD TELEGRAPH ACT**



**Why in news?**

- The Lok Sabha recently passed the omnibus Telecom Bill, 2023, which will replace existing laws, including

the 138-year-old Indian Telegraph Act.

- The bill seeks to supersede the existing regulatory framework for the telecommunication sector, based on the Indian Telegraph Act, of 1885, the Wireless Telegraphy Act (1933), and the Telegraph Wires (Unlawful Possession) Act (1950).

**Details:**

- The Bill seeks to reform and simplify the regulatory and licensing regime for telecommunications and remove bottlenecks in creating telecom infrastructure.
- It also allows the government to temporarily take control of telecom services in the interest of national security and provide a non-auction route for the allocation of satellite spectrum.

**Key Highlights:**

- The Telecom Bill, 2023 provides a mechanism to exercise the right of way for laying telecom infrastructure in public as well as private property.
- The Central government may provide for measures to protect users such as requiring prior consent to receive specified messages, and creation of a do not disturb register.
- Authorisation will be also be required from the Central government to establish and operate telecommunications networks, provide telecommunications services or possess radio equipment.
- Spectrum will be allocated through auction, except for specified entities and purposes for which it will be assigned administratively.
- Telecommunication may be intercepted on specified grounds, including security of the state, public order, or prevention of offences. Telecom services may be suspended on similar grounds.
- On the occurrence of any public emergency, including disaster management, or in the interest of public safety, the Central government or a State government or any officer specially authorised in this behalf by the Central government or a State government, if satisfied that it is necessary or expedient so to do, by notification, take temporary possession of any telecommunication service or telecommunication network from an authorised entity.

**Other features:**

- It has paved the way for the allocation of satellite spectrum, as opposed to the auction.
- The central government will be empowered to establish rules for the protection and assurance of cybersecurity in telecommunication networks and services.
- The new version of the bill includes a provision mandating biometric identification by telecom companies (telcos) before issuing SIM cards to consumers.

**Way Forward:**

- ➔ When it gets enacted into law, it will bring sweeping regulatory changes, such as an authorisation regime, clarity on the assignment of satellite spectrum and so on.

### CISF REPLACES DELHI POLICE FOR PARLIAMENT COMPLEX SECURITY

**Why in news?**

- ➔ The Ministry of Home Affairs (MHA) has asked the Central Industrial Security Force (CISF) to take security charge of the Parliament building from the Delhi Police.
- ➔ The CISF will first conduct a survey of the premises prior to the deployment of its security and fire wing.
- ➔ This comes after the December 13 Parliament security breach, in which two individuals jumped into the Lok Sabha chamber from the visitors' gallery, and opened canisters emitting yellow smoke.

**Details:**

- ➔ The CISF will replace Delhi Police as the agency in charge and will take over all related responsibilities, including frisking entrants.
- ➔ Security within the complex will continue to be the responsibility of the Lok Sabha Secretariat. The Delhi Police will continue to protect the outer perimeter.
- ➔ The change will be enforced after a detailed security survey ordered by the Home Ministry.

**About CISF:****Established in 1969 after a fire in Ranchi's HEC**

- ➔ In June 1964, a devastating fire had broken out in Ranchi's Heavy Engineering Corporation plant, with reports suggesting sabotage.
- ➔ This led to the appointment of the Justice Mukherjee Commission which recommended the establishment of a dedicated industrial protection force.
- ➔ Thus, the CISF was set up by an Act of Parliament on March 10, 1969.

**One of seven Central Armed Police Forces**

- ➔ It is one of seven Central Armed Police Forces (CAPF) under the MHA – the other six being the Border Security Force, the Indo-Tibetan Border Police, the

Sashastra Seema Bal, the Assam Rifles, the National Security Guard, and the Central Reserve Police Force.

**Provides security to India's industrial undertakings**

- ➔ It was first inducted at the Fertilizer Corporation of India manufacturing plant in Trombay, Maharashtra, on November 1, 1969.
- ➔ Initially, its remit was restricted to protecting government-owned industries, but this was expanded to include joint-ventures and private undertakings in 2009.
- ➔ It also provides consultancy services to the private sector.

**Women Force:**

- ➔ CISF has the largest percentage of women in its force, in comparison to all other CAPFs.
- ➔ The first batch of women constables was inducted in 1987, and the first woman officer joined as Asstt. Comdt in 1989.
- ➔ CISF is currently headed by Special DG Nina Singh, the first woman to occupy the post.

## INTERNATIONAL RELATION

### INDIA RE-ELECTED TO INT'L MARITIME ORGANISATION COUNCIL WITH HIGHEST TALLY

**Why in news?**

- ➔ India was re-elected to the International Maritime Organisation (IMO) Council with the highest tally at elections held at its assembly recently for the 2024-25 biennium.
- ➔ India's re-election falls under the Category of 10 states with "the largest interest in international seaborne trade", alongside Australia, Brazil, Canada, France, Germany, the Netherlands, Spain, Sweden and the United Arab Emirates (UAE).

**About IMO:**

- ➔ The IMO is the premier body that oversees the maritime sector, which in turn underpins international trade, transport and all maritime activities.
- ➔ The council is the executive organ of IMO and is responsible, under the assembly, for supervising the work of the organisation.

- Between sessions of the assembly, the council performs the functions of the assembly, except that of making recommendations to governments on maritime safety and pollution prevention.

**3 Assembly of IMO:**

- The 33rd Assembly of IMO is meeting at the IMO Headquarters in London between November 27 and December 6.
- All 175 member states and three associate members are entitled to attend the assembly, which is the IMO's highest governing body.
- The assembly normally meets once every two years in a regular session.
- It is responsible for approving the work programme, voting the budget and determining the financial arrangements of the organisation.
- It also elects the organisation's 40-member council at these meetings for the next two-year period.

**CHINA SLAMS US FOR 'ILLEGALLY' ENTERING WATERS NEAR DISPUTED SECOND THOMAS SHOAL**



**Why in news?**

- China recently accused the United States of escalating tensions in the South China Sea after it claimed that an American combat ship "illegally" entered waters near the Second Thomas Shoal, which is a disputed atoll.
- China also described the US as "the biggest threat to peace and stability" in the region.

**Second Thomas Shoal:**

- China refers to Second Thomas Shoal as Renai Reef and it is about 200 kilometres from the western Philippine island of Palawan.
- The disputed South China Sea atoll is more than 1,000 kilometres from China's nearest major landmass, Hainan Island.

**South China Sea conflict:**

- Territorial disputes in the South China Sea grab the attention of the world.
- It involves conflicting island and maritime claims in the region by several sovereign states, namely Brunei,

China Taiwan, Indonesia, Malaysia, Philippines, and Vietnam.

- China has ignored a 2016 ruling by the Permanent Court of Arbitration in The Hague that its claims to almost the entire sea have no legal basis.
- In recent years, China has ramped up patrols of the waters and reefs in the South China Sea and built artificial islands that it has militarised to reinforce its assertion.

**COMMONWEALTH RELEASES MILITARY JUSTICE PRINCIPLES**



**Why in news?**

- The Commonwealth Secretariat published the Stellenbosch Draft of the 'Commonwealth Military Justice Principles', comprising 10 basic principles that outline the bare minimum expectations from any system of military justice.
- These pertain to adherence to the principles of separation of powers, rule of law, impartiality, independence and competence of adjudicators and prosecution, rights of the accused, open-access, and appellate rights.

**Details:**

- Signed in Stellenbosch town of South Africa, the draft seeks to "reaffirm" and "reiterate" the Commonwealth's belief "that an independent, effective, and competent legal system is integral to upholding the rule of law".
- The draft further aims to "recognise" the unique roles military justice systems play to reflect the nature of the armed forces defending their nations and international security.
- The Commonwealth is an international body comprising 56 nations, including India, that promotes democracy, good governance, peace and the rule of law.

**Key Highlights:**

- The principles laid down in the Stellenbosch Draft state that when it comes to military justice, it must be ensured that the law and procedure relating to military justice are reviewed at regular intervals to ensure their compliance with best practices and developments in international domestic jurisdictions.

- ⇒ They pertain to the categories of military justice, judges in military courts, non-judicial members in military courts, jurisdiction, prosecution, protection of victims, rights of accused, open and accessible proceedings, executive review and appeals and summary proceedings.
- ⇒ The principles further aim to enhance the support for discipline, operational effectiveness and morale of the armed forces, to extend the laws of the country to personnel outside the relevant country's general jurisdiction, and to ensure accountability and compliance with international and domestic law.

#### Committee of experts:

- ⇒ The military principles have been drafted and signed by a 15-member "committee of experts", comprising two Indian lawyers; Major Navdeep Singh (retired) and Aishwarya Bhati who have a background in military law.
- ⇒ For the formulation of the military principles, a five-member global advisory committee was constituted by the Commonwealth Secretariat earlier this year and a 10-member global consultation group was thereafter constituted on the recommendations of the advisory committee.

#### Way Forward:

- ⇒ The Stellenbosch principles are expected to be a valuable resource for legal, judicial, academic and public policy guidance.

### CABINET APPROVES MOU BETWEEN INDIA AND ITALY ON COOPERATION IN IPR



#### Why in news?

- ⇒ The Union Cabinet recently gave its approval for signing of Memorandum of Understanding between the Department for Promotion of Industry and Internal Trade, India and the Directorate General for the Protection of Industrial Property-Italian Patent and Trademark Office of Italy on Cooperation in the field of Industrial Property Rights.

#### Details:

- ⇒ The MoU will promote between the Participants the establishment of a mechanism that allows them to

develop cooperation activities in the field of IP and information technology services related to this field.

#### Background:

- ⇒ The purpose of the MoU is to support enterprises, especially start-ups and SMEs in accessing to and participating in the national and international IPR systems.
- ⇒ The MoU also seeks to streamline the procedures related to processing of IPR applications, fostering IP awareness, encouraging IPR commercialization and enforcement.
- ⇒ The activities under the MoU will provide an opportunity for exchange and dissemination of best practices, experiences and knowledge in the field of IPRs through the participation in programs and events, organized singly or jointly by the Participants.

### INDIA AND OMAN IN TALKS TO SIGN AN ECONOMIC PARTNERSHIP AGREEMENT



#### Why in news?

- ⇒ Recently, Sultan Haitham bin Tarik the ruler of Oman paid his first state visit to India.
- ⇒ India and Oman are on track to sign a comprehensive economic partnership agreement.

#### Key Highlights:

- ⇒ The two sides signed on five documents that included an agreement between the Financial Intelligence Unit of India and the National Centre for Financial Information (NCFI) to prevent money laundering.
- ⇒ As a gesture to celebrate the ancient relation between India and Oman the two sides also took up a proposal by the Ministry of Culture to recreate the maritime voyage of a stitched ship which is expected to sail from Mandvi in Gujarat to Muscat during 2025-26.
- ⇒ They strongly condemned terrorism in all its forms and manifestations.
- ⇒ They underscored the significance of fostering the universal values of peace, moderation, coexistence and tolerance.

#### Background:

- ⇒ This is the first state visit to India by an Omani ruler in 26 years.

- ⇒ Sultan Haitham bin Tarik took charge in 2020 after the death of Sultan Qaboos, who was known for his friendly attitude to India.
- ⇒ In 2020, Sultan Qaboos was honoured with the Gandhi Peace Prize by India.

**INDIA VOTES FOR PERMANENT SOVEREIGNTY OF PALESTINIAN PEOPLE AT UN GENERAL ASSEMBLY**



**Why in news?**

- ⇒ India supported a resolution at the United Nations General Assembly to affirm the right of Palestinian people to self-determination.
- ⇒ The resolution received overwhelming support from 172 member nations, with the United States and Israel being the sole dissenters.

**Details:**

- ⇒ The development follows India's earlier vote in favour of a draft resolution during a General Assembly session, where India after abstaining for about eight weeks, called for an immediate humanitarian ceasefire in the Israel-Hamas conflict.
- ⇒ The United States and Israel, along with eight other nations, voted against this resolution.

**India's stand:**

- ⇒ India's voting pattern in the past week appears to have assuaged concerns in the Arab world, where some perceived a tilt towards Israel.
- ⇒ India has consistently asserted that a lasting peace in the region depends on a two-state solution.
- ⇒ India's stance on these critical resolutions reflects its commitment to a balanced approach in addressing the complexities of the Israel-Palestine conflict in the United Nations.

**Resolution by Egypt:**

- ⇒ An earlier resolution, introduced by Egypt that called for an immediate humanitarian truce, was adopted on December 12 during an emergency special session.
- ⇒ It secured 153 votes in favour, with 23 nations abstaining and 10 voting against it.
- ⇒ The resolution, sponsored by nations including Algeria, Bahrain, Iraq, Kuwait, Oman, Qatar, Saudi

Arabia, the UAE, and Palestine, called for an immediate humanitarian ceasefire in Gaza.

- ⇒ It reiterated the demand for all parties to adhere to international law, especially in safeguarding civilians, and stressed the urgent and unconditional release of hostages, coupled with ensuring humanitarian access.

**ECONOMY**

**INDIA INFRASTRUCTURE REPORT 2023 RELEASED**



**Why in news?**

- ⇒ The India Infrastructure Report 2023 on Urban Planning and Development was released recently.

**Details:**

- ⇒ It has been a collaborative effort of the IDFC Foundation, Infrastructure Development Corporation (Karnataka) Ltd. (iDeCK) and the National Institute of Urban Affairs (NIUA).
- ⇒ The report is a significant milestone in the acclaimed India Infrastructure Report (IIR) series, initiated by the IDFC Foundation in 2001.

**Key Highlights:**

- ⇒ Spotlight on the transformative potential of digital technology in shaping the urban landscape of India. Focus areas include the concept of 'smart cities' and the significance of performance ranking criteria.
- ⇒ Examination of financial dimensions of urban development, with a special emphasis on public-private partnerships (PPPs), the financial sustainability of urban local bodies, and the efficacy of municipal bonds as potent financing instruments.
- ⇒ Urban transportation planning and urban redevelopment as pivotal components of effective urban governance through transit-oriented development, efficient urban goods movement, and floor space and land price regulation in India.

**About IIR 2023:**

- ⇒ The India Infrastructure Report (IIR) 2023 contains 25 chapters by prominent names in the urban development and policy ecosystem on the current state of urban development in India.

- This annual publication has been instrumental in identifying and analyzing legal, fiscal, regulatory, technological, social, and conceptual aspects related to contemporary themes relevant to infrastructure development.
- This makes it an invaluable resource for those involved in formulating urban policy, as well as for those interested in the development of India's infrastructure and urbanization, such as policy makers, investors, academics, financiers, and multilateral agencies.

### RAILWAYS WITHDRAWS EMERGENCY CASHLESS TREATMENT SCHEME



#### Why in news?

- The Indian Railways have withdrawn the Cashless Treatment Scheme in Emergency (CTSE), a medical facility benefitting a few lakh of serving/retired employees and their dependent family members nationwide.

#### Details:

- The Railway Board reviewed the implementation of the scheme and after a careful deliberation took a decision to withdraw the CTSE with immediate effect.
- It was also decided that no refund would be issued to CTSE card holder for the amount that was deposited for subscription of the scheme.

#### About CTSE:

- A pilot project for providing cashless treatment in emergency in private railway empanelled hospitals was initially launched in metro cities in 2016.
- Later, the ambit of the scheme was expanded across the railway network facilitating serving/retired employees and their dependent family members to avail treatment in private hospitals in case of any emergency.
- While introducing the scheme, the railways said comprehensive healthcare facilities were being provided through railway network of hospitals to serving/retired employees along with their dependent family members.
- It was felt that a large number of retired beneficiaries lived in the newly developed suburbs of various cities throughout India. These parts of the city were

often far away from the established Railway Health Institutions.

#### Significance:

- The CTSE was rolled out and empanelled private hospitals nominated to provide necessary treatment in emergencies and raise the bill directly to the railways.
- The scheme designed to work seamlessly on a pan-India basis facilitated any retired employee settling in any city or moving from place to place to get emergency medical facility anywhere in the country without the need for any formal referral from the local railway medical authorities.

### WHAT IS THE CONTROVERSY OVER GERMANY DEBT BRAKE RULE?

#### Why in news?

- Germany's constitutional court recently ruled unlawful a government move to reallocate €60 billion, unused from the sums initially earmarked for the pandemic emergency, to a "climate and transformation fund" (KTF).

#### Details:

- The coalition government led by Chancellor Olaf Scholz's centre-left Social Democrats (SPD) was in breach of the fiscal deficit limits enshrined in 2009 on two counts.
- The first was the move to channel underutilised allocations from one sector to another and the second, the roll-over of debt from one fiscal year to the next.

#### What is the debt brake rule?

- The debt brake rule, or the balanced budget rule, sets a cap on how much governments can borrow to finance various public projects.
- It restricts the federal government in Berlin from running a fiscal deficit in excess of 0.35% of Gross Domestic Product (GDP) and in effect prohibits the country's 16 regions from any deficit spending whatsoever.
- The measure was enshrined into law in 2009 by the grand coalition government of the centre-right Christian Democratic Union (CDU), its sister party in the state of Bavaria the Christian Social Union (CSU) and the SPD, through an amendment to the German constitution.
- The budget brake is more or less the domestic version of the stringent borrowing and spending curbs built into the European Union (EU)'s Stability and Growth Pact (SGP) and the 2012 Fiscal Compact Treaty.

#### What was the legal challenge about?

- The plaintiffs to the dispute, the opposition CDU and CSU, contended that investments in climate change and energy transition were part of the long-term financing activities of the state.

- As such, these could not be funded from the emergency exemption provided in the debt brake, which was related specifically to COVID-19 relief.
- The government countered that the diverted money addressed the economic consequences of the pandemic, insofar as the investment shortfall could be linked to the economic impact from COVID-19.

**What's next?**

- It is unclear, even after the Karlsruhe verdict, whether Berlin will moderate its stance on fiscal rectitude as EU leaders deliberate new proposals to customise debt and deficit rules specific to a country's macro-economic parameters.

**MEASURES FOR DEVELOPMENT OF SUSTAINABLE TOURISM**



**Why in news?**

- The Ministry of Tourism started the Destination Based Capacity Building programme.
- The objective of the program is to train, upgrade, sensitize and to bring the services/trainings at the door steps of the local people and service providers residing near tourism sites and destinations who cannot afford to travel to the cities/towns to take training.

**Details:**

- Till now more than 12000 candidates have been trained under this initiative and more than 150 such training has been conducted at various tourist destinations across the country.
- To position India as a preferred global destination for sustainable and responsible tourism, Ministry of Tourism has formulated National Strategy for Sustainable Tourism.

**Following strategic pillars have been identified for the development of sustainable tourism:**

- a) Promoting Environmental Sustainability
- b) Protecting Biodiversity
- c) Promoting Economic Sustainability
- d) Promoting Socio-Cultural Sustainability
- e) Scheme for Certification of Sustainable Tourism
- f) IEC and Capacity Building

**Governance:**

- To assist the Ministry in implementation of National Strategy for Sustainable Tourism, Ministry has designated Indian Institute of Tourism & Travel Management (IITTM) as the Central Nodal Agency – Sustainable Tourism (CNA-ST).
- Under the Scheme of Domestic Promotion and Publicity including Hospitality, Ministry of Tourism provides Central Financial Assistance (CFA) up to Rs.50.00 Lakh to State Governments and up to Rs.30 Lakhs to UT Administrations on the proposal of fairs/festivals and tourism related events (i.e. seminars, conclaves, conventions etc.).

**The components covered under the scheme are as under:**

- a) Creation of semi-permanent structures.
- b) Production of posters, pamphlets, advertisement in newspaper and production of film.
- c) Remuneration of artists.
- d) Sitting arrangements, lighting, sound, lodging & boarding, transportation, hiring of space and other similar activities.

**Financial assistance:**

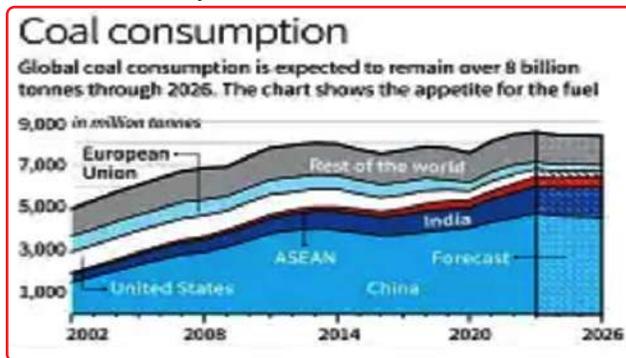
- The Ministry of Tourism (MoT) under the Schemes of "Swadesh Darshan", "Pilgrimage Rejuvenation and Spiritual Heritage Augmentation Drive" PRASHAD and "Assistance to Central Agencies" provides financial assistance to State Governments/ Union Territory Administrations/Central Agencies for the development of tourism related infrastructure and facilities at various tourism destinations in the country.
- To encourage the State Tourism Departments to take major IT initiatives for improving tourist information and facilitation as well as marketing and publicizing their tourist products, the Ministry of Tourism provides Central Financial Assistance to the States and UT Governments to enable them to adopt wide-spread use of information technology in their tourism products and services, comprising publicity, promotion, marketing, etc.
- Under this scheme, financial assistance up to 50% of the IT project (of States or UTs) is given to the State/ UT Governments, restricted to an annual ceiling for each State/UT, which would be 90% of the total project cost or Rs.50 lakhs, whichever is lower.

**GLOBAL COAL DEMAND LIKELY TO DECLINE 2.3 PERCENT BY 2026, IEA**

**Why in news?**

- Despite production of coal reaching a record in 2023, global demand is expected to decline by 2026, a report by the International Energy Agency (IEA) says.
- While the decline is expected to be due to a shift towards renewable energy and plateauing demand

in China, India will remain the “driving force” for the fuel until that year.



### Key Highlights:

- The report sees the global demand for coal rising by 1.4% in 2023, surpassing 8.5 billion tonnes for the first time. This increase, however, masks stark differences among regions.
- While demand in the European Union and United States is expected to drop by 20% each, it is expected to rise by 8% in India and 5% in China in 2023 due to demand for electricity and diminished generation of hydroelectric power.
- Currently, a little over half the world's coal demand comes from China. With a major expansion of renewable energy expected, coal demand in the country is expected to fall in 2024 and plateau in 2026. Overall, this will result in a 2.3% fall in global coal demand by 2026.

### Factors for decline in coal demand:

- The IEA's expectations of a decline in coal demand is premised also on a change in global climate.
- The current El Nino conditions, usually linked with a drier monsoon in Asia, are expected to turn to La Nina, which is generally linked to better rainfall, between 2024 and 2026. This will presumably translate to greater hydroelectric power output.
- Moreover, a steep upward trend in low-cost solar photovoltaic deployment is expected to aid renewable power generation.

### Global demand:

- Coal, the most important energy source for electricity generation, steel-making, and cement production, is also the largest source of carbon dioxide (CO<sub>2</sub>) emissions from human activity.
- Despite forecasts of a fall, global consumption is expected to remain well over 8 billion tonnes through 2026.

### Coal emissions:

- Reducing use of ‘unabated’ coal, or coal-burning without technologies to capture carbon, is among the explicit agreements of countries signatory to the United Nations Framework Convention on Climate Change, the world's biggest influencer of climate policy.

- To have a chance at keeping temperatures from rising beyond 1.5 degrees Celsius by the end of the century, coal emissions must decline nearly 95% between 2020 and 2050.

### Fact:

- China, India, and Indonesia are expected to break output records in 2023, pushing global production to a new high in 2023. These three countries now account for more than 70% of the world's coal production.

## ENVIRONMENT

### UAE ANNOUNCES 30 BN DOLLAR FUND TO BOOST CLIMATE INVESTMENTS



### Why in news?

- The UAE, host of the 28th Conference of Parties (COP-28), announced a \$30-billion commitment to an investment fund called ALTERRA.

### About ALTERRA:

- The privately managed fund aims to mobilise \$250 billion globally by 2030 and be the largest of its kind, geared towards climate investments and transforming emerging markets and developing economies.
- COP-28 President Sultan Ahmed Al Jaber will chair the fund and Director-General Majid Al Suwaidi will serve as its chief executive officer.
- ALTERRA has been established by Lunate, an independent global investment manager, and is domiciled in the Abu Dhabi Global Market.

### ALTERRA will have four key verticals namely:

- a) Energy Transition,
- b) Industrial Decarbonisation
- c) Sustainable Living
- d) Climate Technologies

### Clean energy capacity in India:

- From the initial tranche, an unspecified amount has been earmarked for the development of over 6 GW (1 GW is 1,000 MW) of new clean energy capacity in India.
- This includes establishing 1,200 MW of wind and solar projects that will begin producing clean power by 2025.

**Way Forward:**

- ALTÉERRA provides a transformational solution for attracting private capital.
- By 2030, emerging markets and developing economies will require reportedly \$2.4 trillion every year to address climate change.

**BLIND GOLDEN MOLE REDISCOVERED  
87 YEARS AFTER EXTINCTION**



**Why in news?**

- A blind golden mole that can swim through sand has been rediscovered in South Africa 87 years after it was declared extinct.
- Scientists were able to locate the mole in sand dunes in the northwest of the country, following a two-year search relying on DNA samples.

**When were these moles spotted last time?**

- The golden mole species had gone out of sight since 1936.
- About the size of a mouse or hamster, they were previously spotted in the small region of Port Nolloth in the Northern Cape.
- They are very hard to spot, owing to their over-sensitive ears, which can detect movement from above ground. Also, they live in largely inaccessible burrows and don't leave tunnels behind them.

**Background:**

- The team of scientists was first able to detect the presence of the golden mole species in June 2021.
- It was then that they surveyed up to 18kms of dunes a day, using a trained sniffer dog, while also relying on 100 soil samples from sites along the northwest coast where golden mole activity was detected.
- An analysis of the survey later confirmed the presence of golden mole in the dunes.

**INDIA, CHINA AMONG BIGGEST  
CARBON DIOXIDE EMITTERS, REPORT  
REVEALS STARK REALITY**

**Why in news?**

- Scientists have reported a 1.1% surge in carbon dioxide emissions in 2023 compared to the previous year.



- This increase has been attributed primarily to heightened pollution levels from China and India, with global officials at international climate talks grappling with the reality of emissions that continue to climb despite ambitious targets.

**Details:**

- The Global Carbon Project, an esteemed collective of international scientists, disclosed that a staggering 36.8 billion metric tons of carbon dioxide were released into the atmosphere in 2023, double the amount from four decades ago.
- This alarming figure emerged as world leaders convened to discuss strategies aimed at slashing emissions by 43% by 2030.
- With the current trajectory, even maintaining the 2-degree Celsius threshold is becoming increasingly precarious, necessitating rapid and substantial cuts in fossil fuel emissions.

**Key Highlights:**

- The equivalent of 2.57 million pounds of carbon dioxide was pumped into the air every second due to fossil fuel combustion and cement manufacturing. If China and India were excluded from the calculations, global emissions would have seen a decline.
- The detailed figures reveal that China's emissions surged by 458 million metric tons from last year, while India's increased by 233 million metric tons. Aviation emissions also climbed by 145 million metric tons.
- In contrast, the rest of the world collectively reduced fossil fuel emissions by 419 million metric tons, with Europe leading the way with a 205 million metric ton reduction, followed by the United States with a decrease of 154 million metric tons.
- Europe's 8% drop in emissions spanned coal, oil, gas, and cement, while the U.S. saw a significant reduction in coal emissions, albeit with minor upticks in oil and gas.
- The report suggests that China's 4% jump in emissions mirrors the post-pandemic recovery experienced by other regions in 2022.

**Way Forward:**

- These findings, based on comprehensive data from nations and companies projected through the end of the month, serve as a clarion call for immediate action.

## JAMMU STUDENT-LED NATIONAL MOVEMENT FOR ENERGY CONSERVATION NAMED 4E WAVE LAUNCHED



### Why in news?

- The Union Minister for Power and New & Renewable Energy has launched 4E Wave, a student-led National Movement for Energy Conservation.
- The movement strives to promote sustainable practices and instil a sense of responsibility in individuals and communities to save energy.

### 4E Wave encapsulates four key elements:

- Eco-friendliness: Promoting energy-saving practices that are environmentally friendly
- Economy: Emphasizing energy-saving solutions that lead to economic benefits for individuals and communities
- Education: Focusing on educating the public about energy-saving methods and their importance
- Empowerment: Empowering individuals and communities to take active roles in conserving energy

### Details:

- Originating from the students of Government College of Engineering & Technology (GCET), Jammu, this youth-led movement, launched with the support of J&K Power Development Department, Government of J&K and Bureau of Energy Efficiency (BEE), Ministry of Power, Government of India, invites individuals across the nation to contribute to the cause of energy conservation.
- The web portal of the movement will provide an interactive platform to the citizens nationwide for information and resource-sharing related to energy conservation.
- Participants will also get personalized energy-saving tips tailored to their consumption patterns, regular updates on latest developments in energy conservation, and a dynamic platform for sharing articles on energy conservation for publication in the e-magazine named 'e-kshitij' to be published quarterly. Additionally, the portal will host contests focusing on energy conservation, providing an interactive experience for users.

### Way Forward:

- The 4E Wave movement marks a resolute commitment to mitigate the impact of harmful carbon emissions and pave the way for a sustainable energy future.

## PENGUINS SLEEP FOR JUST 4 SECONDS AS THEY GUARD NEWBORNS



### Why in news?

- In Antarctica's breeding colonies, chinstrap penguins have developed a remarkable strategy to balance the demands of parenting with the need for sleep.

### Adaptation:

- Researchers have discovered that these dedicated penguin parents manage to accumulate approximately 11 hours of sleep each day through thousands of microsleeps, each lasting only about four seconds.
- This extraordinary sleep pattern allows the penguins to maintain constant vigilance over their vulnerable eggs and chicks, protecting them from predators such as the brown skua bird and from other penguins that may attempt to pilfer pebbles from their nests.
- The findings reveal how these birds adapt to the challenges of raising offspring in a crowded and noisy environment.

### Key Highlights:

- The study involved attaching sensors to measure brain waves on 14 adult chinstrap penguins over an 11-day period on King George Island. The recorded brain activity confirmed that the penguins were indeed engaging in microsleeps.
- Chinstrap penguins, easily identified by the distinctive black line under their chins, lay their eggs in November and share the responsibilities of incubation and chick-rearing with their mates.
- While one parent fishes for food, the other stands guard, ready to fend off threats to their progeny.

### Way Forward:

- The research team has not yet studied the penguins' sleep patterns outside the breeding season and is curious whether they might enjoy longer periods of uninterrupted sleep at other times.
- While unique sleeping adaptations have been observed in other animals, such as frigatebirds and

northern elephant seals, the chinstrap penguins' use of microsleeps is an unprecedented discovery.

**GREEN TURTLES NESTING RANGE EXPANDS UNDER WARMING CLIMATE**



**Why in news?**

- Rising global temperatures could lead to an increase in the nesting range of green turtles in the Mediterranean Sea, as per a study.
- Under the worst-case climate scenario, the nesting range could increase by over 60% points, spreading west from the current area to include much of the North African, Italian, and Greek coastlines.

**Impact of rising temperatures:**

- Human-caused climate change has caused sea surface temperatures to increase globally, with severe impacts on some marine life.
- Sea turtles are potentially particularly susceptible, as the sex of their offspring is dependent on incubation temperature.
- Although previous research has investigated the effects of climate change on several different populations of sea turtles worldwide, there has been very little research into the green turtle (*Chelonia mydas*) population in the Mediterranean Sea.

**Basis of production:**

- The researchers developed a model for predicting the suitability of a point on the Mediterranean coastline as a green turtle nesting location.
- They first assessed the predictive power of the model by evaluating it against 178 confirmed nesting locations, recorded between 1982 and 2019 and mainly limited to Turkey and Cyprus in the eastern Mediterranean.
- They found that sea surface temperature, sea salinity, and human population density most affected the suitability of a specific location as a nesting site.
- They then modelled how four different greenhouse gas emission scenarios could affect the nesting range of green turtles in 2100.

**Key observations:**

- They found that progressively worse climate scenarios were associated with greater increases in the nesting range in the Mediterranean.

- Under the worst-case climate, scenario modelled, the nesting range increased by 62.4% points, and included the North African coastline to Algeria, much of Italy and Greece, and the south Adriatic Sea.
- However, the authors warn that this increase in green turtle nesting range in the heavily populated central and western Mediterranean would bring them into increased contact with humans and urbanised beaches, which could negatively affect nesting success.

**INDIA FIRST PROJECT TO TACKLE URBAN FLOODS AFTER CHENNAI DELUGE**



**Why in news?**

- In response to the urgent need for effective flood management solutions, Prime Minister has sanctioned an ambitious urban flood mitigation project for Chennai, with a budget allocation of Rs. 561.29 crore under the National Disaster Mitigation Fund (NDMF).
- This initiative, which includes a substantial Central assistance of Rs. 500 crore, is aimed at bolstering the city's defenses against the recurrent threat of floods.

**Background:**

- Chennai is currently grappling with the devastating effects of floods, marking the third such calamity to besiege the metropolis in less than a decade.
- The city's struggle with extreme weather events has brought to light the increasing vulnerability of India's urban landscape to sudden and severe flooding due to excessive rainfall.

**Key Highlights:**

- The 'Integrated Urban Flood Management activities for Chennai Basin Project' represents a proactive measure to address the challenges posed by urban flooding.
- It is designed to enhance Chennai's resilience to such natural disasters by implementing comprehensive flood management strategies.
- The project will focus on improving the city's infrastructure to better manage excessive rainwater, thereby reducing the risk of flooding and minimizing the impact on residents' lives and livelihoods.

- This project is the first of its kind, setting a precedent for urban flood mitigation efforts across India.

**Way Forward:**

- It is expected to serve as a model for developing a broader framework that can be adapted to safeguard other metropolitan areas facing similar risks.

**CAUVERY BASIN LOST NEARLY 12,850 SQ. KM OF GREEN COVER**

**Shrinking greenery**  
 Pattern of natural vegetation cover in the Cauvery basin over the years  
 (In sq. km)

Year	Karnataka	Kerala	Tamil Nadu	Total
1965	17,072.81	1,043.64	10,077.78	28,194.23
2016	7,408.50	764.16	7,172.42	15,345.08
Loss	9,664.31	279.48	2,905.36	12,849.15

Source: "Cauvery river: Land use dynamics biodiversity & hydrological status," a paper authored by T. V. Ramachandra, Vinay S., Bharath S. and Bharath H. Aithal, Indian Institute of Science, Bengaluru.



**Why in news?**

- Natural vegetation on nearly 12,850 sq. km of land in the Cauvery basin was lost in the 50 years from 1965 to 2016, as per the Indian Institute of Science (IISc), Bengaluru.

**Key Highlights:**

- Karnataka has lost much more than any other State in the basin. It accounts for three-fourths of the lost cover, while Tamil Nadu's share is around one-fifth.
- The natural-vegetation cover went down by around 46% all these years.
- The quantum of reduction of dense vegetation was 35% (6,123 sq. km) and that of degraded vegetation, 63% (6,727 sq. km).

**Worst affected areas:**

- Areas that suffered adverse changes in the extent of forest cover include the Brahmagiri Wildlife Sanctuary, Bandipur National Park, Nagarhole National Park and the Cauvery Wildlife Sanctuary.
- In respect of the Bannerghatta National Park, the moist deciduous forest area, which was about 50% in 1973, stood at 28.5% in 2015 due to "anthropogenic pressure" on the National Park and its environs.

**INDIAN FOREST AND WOOD CERTIFICATION SCHEME LAUNCHED**

**Why in news?**

- The Ministry of Environment, Forests and Climate Change has launched the Indian Forest & Wood Certification Scheme.
- This national forest certification scheme offers voluntary third-party certification designed to promote sustainable forest management and agroforestry in the country.

- The scheme includes forest management certification, tree outside forest management certification, and chain of custody certification.



**Market incentives:**

- The Indian Forest and Wood Certification Scheme can provide market incentives to various entities that adhere to responsible forest management and agroforestry practices in their operations.
- This includes state forest departments, individual farmers, or Farmer Producer Organizations engaged in agroforestry and farm forestry, as well as other wood-based industries in the value chain.

**Indian Forest Management Standard:**

- The Forest Management certification is based on the Indian Forest Management Standard, consisting of 8 criteria, 69 indicators and 254 verifiers, which is an integral part of the National Working Plan Code 2023, launched earlier this year.
- A separate Trees Outside Forests Standard, is now introduced as a part of the newly launched Indian Forest & Wood Certification Scheme.

**Indian Forest and Wood Certification Council:**

- The Indian Forest and Wood Certification Scheme, will be overseen by the Indian Forest and Wood Certification Council, which will act as a multistakeholder advisory body.
- The Council is represented by members from eminent institutions such as Indian Council of Forestry Research and Education, Forest Survey of India, Quality Council of India, Indian Institute of Forest Management including representatives from the Ministries of Agriculture and Farmers' Welfare and Ministry of Commerce and Industry, State Forest Departments, Forest Development Corporations, and representatives from wood-based industries.

**Implementing Agency:**

- Indian Institute of Forest Management, Bhopal will act as the scheme operating agency and will be responsible for overall management of the Indian Forest and Wood Certification Scheme.
- The National Accreditation Board for Certification Bodies under the Quality Council of India will accredit the certification bodies which will carry

out independent audits and assess adherence of various entities on the standards prescribed under the scheme.

**NMCG LAUNCHES GLOBAL RIVER CITIES ALLIANCE**



**Why in news?**

- The Global River Cities Alliance (GRCA), led by the National Mission for Clean Ganga (NMCG) under the Ministry of Jal Shakti, was launched at COP28, the United Nations Climate Change Conference in Dubai, United Arab Emirates.

**River Cities Alliance (RCA):**

- The countries namely India, Egypt, Netherlands, Denmark, Ghana, Australia, Bhutan, Cambodia, Japan and river-cities of The Hague (Den Haag) from the Netherlands, Adelaide from Australia, and Szolnok of Hungary and International funding agencies the World Bank, Asian Development Bank (ADB), Asian Infrastructure Investment Bank (AIIB) and knowledge management institution like KPMG entered into a partnership, widely expanding the reach of the existing River Cities Alliance (RCA), formed by NMCG in association with National Institute of Urban Affairs (NIUA) in 2021.
- The River Cities Alliance currently has 142 river cities in India and serves as a dedicated platform for members to discuss aspects related to enhancing the state of urban rivers within their administrative boundaries.
- On December 6, the RCA had signed a Memorandum of Common Purpose (MoCP) with 124 member Mississippi River Towns and Cities Initiative of the US.

**GRCA:**

- GRCA is a unique alliance covering 275+ global river-cities in 11 countries, international funding agencies and knowledge management partners and is first of its kind in the world.
- The National Mission for Clean Ganga, under the Jal Shakti ministry and Housing and Urban Affairs ministry's National Institute for Urban Affairs (NIUA), will take on the role of the Secretariat of the GRCA

to generate the initial momentum of the alliance activities which will include knowledge exchange, capacity development, high-level advocacy, and bi-lateral interactions among member cities.

**Way Forward:**

- The launch of GRCA signifies a momentous step in global efforts towards river conservation and sustainable water management.
- Following this, partner countries are poised to coordinate post-COP activities, shaping the architecture of GRCA for effective implementation.

**THE SAIGA HAS BEATEN EXTINCTION FOR NOW, FINDS NEW IUCN RED LIST**



**Why in news?**

- Recently, the species' (Saiga tatarica) category was changed from Critically Endangered to Near Threatened by the International Union for Conservation of Nature (IUCN).
- The Saiga has a Medium Conservation Legacy; without past conservation action, the Saiga would likely have gone extinct in one spatial unit, and would have lost viability and functionality in others, resulting in a score of 19 per cent.

**Background:**

- The Saiga have roamed the earth since the last Ice Age.
- There were an estimated one million saigas in Russia and Central Asia in the early 1990s, but by 2003 their numbers had plummeted, with only six per cent of the population remaining.

**Habitat:**

- The Saiga has two sub-species: Saiga tatarica tatarica (found in most of the range) and Saiga tatarica mongolica (found only in Mongolia).
- The antelope were once found throughout the Eurasian Steppe, the great band of grassland that stretches from Hungary in Europe to Manchuria in Asia.
- Today, the animal is found in fragmented populations within Kazakhstan, Mongolia, the Russian Federation and Uzbekistan, according to the Saiga Conservation Alliance (SCA), a network of researchers and conservationists working to protect the Saiga.

**Conservation Efforts:**

- The IUCN update credited “effective national and international conservation efforts” for turning the tide in favour of the Saiga.
- This substantial positive change in global Red List status reflects the remarkable recovery of Saiga populations in Kazakhstan, which have recovered from a perilously low estimate of just 48,000 in 2005 to now over 1.9 million.
- The Government of Kazakhstan has demonstrated highly commendable leadership in species recovery, investing heavily in a suite of impactful actions including anti-poaching initiatives, robust law enforcement and border control measures, and establishment of a series of major new State Protected Areas.
- It added that the government’s collaboration with civil society had played a crucial role in fostering a collaborative network that incorporated government agencies, conservation practitioners, academics, and international experts.

**Population in other countries:**

- Current population numbers for Saiga in Russia are 38,000, up from 4,500 in 2016, while Uzbekistan hosts an estimated 500 Saiga, c.200 of which were first discovered in the Aral Sea Region in 2021 whilst the remaining 300 are isolated by human-made barriers to migration.
- The Mongolian subspecies numbers 15,540 individuals, according to a November 2023 census. There have been no instances of poaching since 2018, when the population level was 3,391 said.

**Way Forward:**

- The species will only be fully recovered if it regains its role in the ecosystem across its entire range, with ongoing poaching, illegal trade, disease, climate change, disturbance and infrastructure development all posing a threat to Saiga.

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**INDIA FASTEST SOLAR ELECTRIC BOAT LAUNCHED**


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**Why in news?**

- ‘Barracuda’, said to be India’s fastest solar-electric boat, was launched recently at the yard of Navalt Solar and Electric Boats, located off Aroor in Alappuzha.

**Key Highlights:**

- Named after the swift, long fish, Barracuda was designed by Navalt and can be deployed even in the rough seas as a workboat to ferry up to 12 passengers and cargo.
- The 14-metre-long, 4.4-metre-wide vessel can attain a top speed of 12.5 knots (23 kmph) and has a range of seven hours on a single charge.
- It has twin 50 kW electric motors, a marine-grade LFP battery, and 6 kW solar power.
- It is engineered to navigate through waves as tall as four metres and operates without noise, vibration and air pollution.

**Navalt Solar and Electric Boats:**

- It won the world’s best start-up award in the mobility and transportation category at the Berlin Start-up Energy Transition Awards 2023.
- The firm that operates from Kochi has also received various prestigious awards, including the Gustave Trouve Awards twice.

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**NOMA, THE LATEST ADDITION TO WHO'S LIST OF NEGLECTED TROPICAL DISEASES**


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**Why in news?**

- The World Health Organization (WHO) recently, added one of the world’s most under recognised health challenges, noma, to its official list of neglected tropical diseases (NTD).

**About Noma:**

- The name of the disease comes from the Greek word “nomē”, meaning “to devour”, as noma eats away facial tissue and bones if not treated early.
- Also known as cancrum oris or gangrenous stomatitis, it is a severe gangrenous disease of the mouth and face with a mortality rate of approximately 90 per cent.
- It is also associated with extreme poverty, malnutrition and poor access to sanitation and oral hygiene.
- Noma mainly affects children aged 2-6 years old and is found most commonly among those living in poor communities. There is an extreme lack of awareness regarding the disease.

**Neglected nature:**

- There are no reliable numbers of cases, the WHO website lists the 'latest' estimates 140,000 cases per year and a prevalence of 770,000 cases. However, the data dates back to 1998.
- The illness's 'hidden' or neglected nature is most likely due to the fact that it affects the world's most marginalised children.

**Risk factors:**

- Noma is associated with a number of risk factors, including poor oral hygiene, malnutrition, weakened immune systems, infections, and extreme poverty.
- While the disease is not contagious, it prefers to attack when the body's defences are weak. The disease begins with gum inflammation and is thought to be caused by bacteria found in the mouth.
- The NTD is frequently seen in developing countries, especially in sub-Saharan Africa, where it occurs almost exclusively among poor children usually aged 3-10 years.

**Symptoms:**

- Noma primarily affects children who are malnourished, infected with infectious diseases, living in extreme poverty with poor oral health, or who have weakened immune systems.
- Because the disease has a high mortality rate, early detection is critical because therapy is most effective in the early stages of the disease. Its spread can be slowed significantly with basic hygiene, antibiotics, and nutritional rehabilitation.
- The NTD often starts as an ulcer on the mucous membrane lining, commonly after a bout of measles or other diseases.
- The patients who survive face many consequences, like significant facial disfigurement, spasm of the jaw muscles, oral incontinence and speech problems.
- The disease is also called the 'face of poverty', as effective drugs like sulfonamides and penicillin and adequate surgical treatment for the effects remain inaccessible for many due to extreme poverty.

**Way Forward:**

- An important step towards eradicating the disease is the inclusion of noma on the WHO's list of neglected tropical diseases.
- The recognition of noma as an NTD aims to amplify global awareness, catalyse research, stimulate funding, and boost efforts to control the disease through multisectoral and multi-pronged approaches.

### BIHAR, REDUCED HUMAN ACTIVITY, INCLUDING MINING BANS, HELPED INCREASE TIGER NUMBERS IN VALMIKI RESERVE

**Why in news?**

- Authorities in Bihar's Valmiki Tiger Reserve (VTR) have credited the rise in the protected area (PA)'s

big cat numbers to a reduction in human activities, including restrictions on illegal mining in its eco-sensitive zone.

**Key Highlights:**

- A total ban on sand and stone mining inside VTR, and strict restrictions on mining in its eco-sensitive zone, helped increase grassland cover.
- This, in turn, caused tiger numbers in the PA to rise to 54 earlier this year, up from 31 in 2018. In 2014, there were only 28 tigers in VTR.
- Herbivores depend on grasslands. An increase in grassland cover thus helps in supporting the prey population, in turn increasing the chances of the carnivores' survival.
- More than half a dozen Himalayan rivers flow through VTR, and the sand mafia harvest sand from them in gross violation of the ban on mining in the eco-sensitive zone.

**VTR's tiger population:**

- The National Tiger Conservation Authority (NTCA) had officially announced the increase in VTR's tiger population in July.
- The reserve has witnessed a 75 per cent increase in tiger count that was praised by NTCA. The organisation placed the reserve in the 'Very Good' category.
- VTR is spread over 899 square kilometres (89,900 ha) in the Valmiki Wildlife Sanctuary. It is located in Bihar's West Champaran district, bordering Nepal to its north and Uttar Pradesh to its west.

**Second tiger reserve in Bihar:**

- Bihar is working for a second tiger reserve in Kaimur district by 2024.
- The state government is waiting to obtain NTCA approval for declaring Kaimur Wildlife Sanctuary as the state's second tiger reserve after VTR.

**SCIENCE & TECHNOLOGY**

### SPACEX LAUNCHES SOUTH KOREA'S FIRST MILITARY SPY SATELLITE FROM CALIFORNIA

**Why in news?**

- A SpaceX rocket recently launched South Korea's first military spy satellite, intensifying a space race on the

peninsula after Pyongyang launched its own first military eye in the sky earlier.



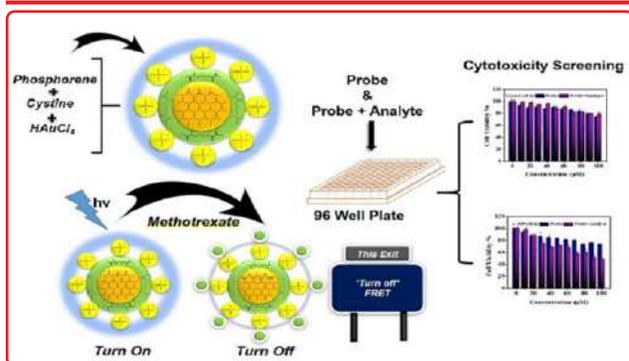
**Details:**

- South Korea's reconnaissance satellite, carried by SpaceX Falcon 9 rockets, lifted off from the Vandenberg US Space Force Base in California.
- The rocket was emblazoned with the word "KOREA."
- Set to orbit between 400 and 600 kilometers (250 to 370 miles) above Earth, Seoul's satellite is capable of detecting an object as small as 30 centimeters (11.8 inches).

**Way Forward:**

- Reaching orbit would mean that South Korea has acquired its first domestically built spy satellite to monitor nuclear-armed North Korea.
- It plans to launch four additional spy satellites by the end of 2025 to bolster its reconnaissance capacity over the North.

**NEW HIGHLY FLUORESCENT MATERIAL FOR DETECTION OF METHOTREXATE**



**Why in news?**

- A new highly fluorescent material with exceptional optical properties has been developed using phosphorene, cystine, and gold (Ph-Cys-Au) which can be used as a visual sensing platform for detecting anti-cancer drug MTX overdose of which has toxic effect on lungs, stomach, and heart.
- Monitoring therapeutic drugs and their elimination is crucial because they may cause severe side effects on the human body.

**Methotrexate (MTX):**

- Methotrexate (MTX) is a widely used anti-cancer drug.
- The MTX value of more than 10 μM in blood plasma is hazardous if it remains in the system for more than 10 hours, resulting in poisoning effects on the lungs, ulcers of the stomach, and heart stroke.
- MTX is highly expensive, and the detection of unwanted overdoses using traditional procedures is time-consuming and involves complex instrumentation.

**Key Highlights:**

- The scientists of Institute of Advanced Study in Science and Technology (IASST), a have developed a highly fluorescent material using phosphorene, cystine, and gold (Ph-Cys-Au).
- The material has exceptional optical properties and thus can be used as a visual sensing platform for detecting the anti-cancer drug MTX.
- This non-enzymatic approach for the detection of anticancer drug Methotrexate can help cytotoxicity screening for therapeutic analysis.

**Outcome:**

- The developed sensing platform outperforms all former systems as the materials are biocompatible with an appreciable detection limit.
- The material shows a detection limit of about 0.0266 nM (for a linear range of 0–140 μL) and 0.0077 nM (for a linear range of 160–260 μL).
- Moreover, the nanocomposite exhibited in vitro cytotoxicity towards cancerous cells, but it was non-cytotoxic for non-cancerous cells.

**INDIA SET TO LAUNCH X-RAY POLARIMETER SATELLITE, SAYS ISRO**



**Why in news?**

- The Indian Space Research Organisation has announced a plan to launch its first X-ray Polarimeter Satellite (XPoSat) to investigate the polarisation of intense X-ray sources.

**Details:**

- This research, supplementing traditional time and frequency domain studies, introduced a

novel dimension to X-ray astronomy, generating anticipation and excitement within the scientific community.

- The satellite will be launched by the Polar Satellite Launch Vehicle from the Satish Dhawan Space Centre in Sriharikota.

**Key Highlights:**

- The XPoSat is designed for observation from a low earth orbit (non-sun synchronous orbit of 650-km altitude, low inclination of approximately six degrees) and will carry two scientific payloads.
- With these two payloads, the mission is capable of simultaneous studies of temporal, spectral, and polarisation features of the bright X-ray sources.
- The mission objectives include the measurement of X-ray polarisation in the energy band of 8-30 keV emanating from X-ray sources and long-term spectral and temporal studies of cosmic X-ray sources in the energy band of 0.8-15 keV.
- The mission life is expected to be approximately five years.

**Payloads:**

- The primary payload, POLIX (Polarimeter Instrument in X-rays), is designed to measure polarimetry parameters, specifically the degree and angle of polarisation, in the medium X-ray energy range of 8-30 keV photons originating from astronomical sources.
- The payload was developed by the Raman Research Institute, Bengaluru, with support from ISRO centres.
- The secondary payload is the XSPECT (X-ray Spectroscopy and Timing) payload, which will provide spectroscopic information within the energy range of 0.8-15 keV.
- The payload was developed by the U.R. Rao Satellite Centre, ISRO.

- The planets have radii between that of Earth and Neptune.
- A study has calculated the orbit details, along with estimates of their masses and densities, which offer clues about the formation of the system and compositions of the planets' atmospheres.

**HD 110067:**

- Planets with radii between that of the Earth and Neptune (referred to as 'sub-Neptunes') are found in close-in orbits around more than half of all Sun-like stars, but details of their composition, formation and evolution are not well understood.
- HD 110067 is a bright star in the Coma Berenices constellation (around 100 light-years away), which is visible from Earth's Northern Hemisphere.
- Observations of HD 110067 made by NASA's Transiting Exoplanet Survey Satellite (TESS) in 2020 and 2022 revealed several dips in the star's brightness, and with additional observations from the 'CHARACTERISING EXOPLANETS SATELLITE' (CHEOPS) the signals were interpreted as six planets passing in front of the star.

**Key Highlights:**

- By studying the three innermost planets, the authors calculated the orbits of all six planets, ranging from around nine days for the innermost planet to around 54 days for the outermost planet.
- They have calculated the masses of the planets and estimate the densities, which are relatively low; the authors suggest that the low densities could be explained by large, hydrogen-rich atmospheres.
- All six planets are in resonant orbits, in which the planets exert regular forces on each other as they orbit. This feature suggests that the system remains practically unchanged since its birth, at least four billion years ago.

**Conclusion:**

- HD 110067 is the brightest star found to host more than four transiting exoplanets to date, the authors note, and add that more planets may exist within or beyond the temperate zone, although such observations have not been made so far.
- They conclude that the HD 110067 system offers a chance to learn more about sub-Neptunes and how systems in this configuration might form.

**SIX EXOPLANETS FOUND ORBITING A NEARBY BRIGHT STAR**



**Why in news?**

- Six exoplanets orbiting around a nearby bright star (HD 110067) in the Coma Berenices constellation has been discovered.

**MOON GETTING HYDROGEN FROM SOLAR WINDS, REVEALS STUDY OF APOLLO SAMPLES**

**Why in news?**

- A recent study conducted by researchers at the US Naval Research Laboratory (NRL) has uncovered a fascinating aspect of the Moon's composition.
- The study, centred on lunar rocks brought back by the Apollo programme, has revealed the presence of hydrogen within these rocks.

- This hydrogen, when combined with lunar oxygen, holds the potential to serve as a valuable resource for future lunar explorations.



#### Details:

- The Apollo programme, which returned with a total of 382 kilograms of lunar rock, provided a substantial amount of material for scientific analysis. Some of these samples were promptly examined, while others were securely stored for later research.
- They studied lunar rock to unravel the origins and formation of water on the Moon.

#### Key Highlights:

- Transmission electron microscopy played a key role in this investigation, focusing on lunar sample 79221. In this technique, a beam of electrons visualised specimens at a highly magnified scale.
- The team concentrated on grains of minerals such as apatite and merrillite, identifying signs of 'space' weathering caused by the solar wind.
- The solar wind is a stream of charged particles emanating from the Sun at speeds of up to 1.6 million km per hour.
- The researchers discovered hydrogen signatures within vesicles, small cavities formed as lava cools.
- This groundbreaking finding indicated that detectable amounts of solar wind are being trapped, potentially creating a reservoir that could be harnessed by future lunar explorers.

#### Way Forward:

- This knowledge is crucial for the prospect of sustained lunar exploration, especially for the establishment of lunar bases, which would benefit from using local resources available on the moon.

### INDIA BIGGEST ENERGY PROJECT WILL BE VISIBLE FROM SPACE

#### Why in news?

- In an ambitious stride towards sustainable energy, India is constructing the world's largest renewable energy project in the Rann of Kutch.
- This colossal undertaking will further India's plans to shift to renewable energy sources, and could be visible from space.



#### Details:

- The project, sprawling over 726 square kilometers is expected to generate a staggering 30 gigawatts (GW) of power. This output is enough to light up over 20 million homes, marking a significant leap in meeting the country's burgeoning energy demands while adhering to environmentally friendly practices.
- Located just 150 kilometers away from the site, in Mundra, is another groundbreaking initiative. Here, India is developing one of the world's most extensive and integrated renewable energy manufacturing ecosystems, focusing on both solar and wind energy components.
- This facility underscores India's dedication to creating a self-reliant energy infrastructure and its active role in the International Solar Alliance.

#### Khavda renewable energy park:

- The Khavda renewable energy park, named after the nearest village to the project site, is an example of India's journey towards an Atmanirbhar Bharat, or a self-sufficient India.
- The Indian government has estimated the cost of this mammoth project at least \$2.26 billion, reflecting the scale and significance of the investment in the nation's future.
- This green energy park is not just about generating electricity; it represents a pivotal moment in the global shift towards renewable sources.
- It aligns with the discussions and goals set forth at the ongoing COP28 climate summit, where shifting to renewable energy remains a key issue.

#### Way Forward:

- Upon completion, the Khavda project will stand as the world's largest green energy park, as India combats climate change and lead by example in the international community.

### US NAVAL LAB CONFIRMS WATER ON MOON

#### Why in news?

- Researchers from the US Naval Research Laboratory (NRL) have detected solar-wind hydrogen in lunar soil samples, a discovery that could revolutionise future lunar exploration and the establishment of bases on the Moon.

- This finding suggests the presence of water on the Moon's surface, which is essential for supporting long-term human presence and further space exploration missions.



**Space weathering:**

- The groundbreaking research was conducted using Apollo lunar soil samples provided by a NASA-funded research mission.
- The NRL team is dedicated to understanding how lunar and asteroidal surfaces interact with the harsh conditions of space, known as space weathering.
- Their previous work had already confirmed the presence of solar wind helium within lunar soil grains.

**Details:**

- For the first time, scientists have demonstrated the detection of hydrogen-bearing species within vesicles in lunar samples.
- While other researchers have found water in planetary samples and NRL's team previously detected helium using advanced techniques like scanning transmission electron microscopy and electron energy loss spectroscopy, this is the inaugural report of in-situ hydrogen in lunar samples.

**Way Forward:**

- The implications of this discovery are vast, potentially aiding in the design of future missions that could utilize in-situ resources to support human and robotic presence on the Moon.

**INDIA CONDUCTS SURVEY LOOKING FOR RESOURCES HIDING IN INDIAN OCEAN BASIN**



**Why in news?**

- In a significant stride towards bolstering the blue economy, India has surveyed the Central Indian Ocean Basin to identify elements hiding in the deep sea.
- The effort has been spearheaded by the Deep Ocean Mission, which aims to delve into the uncharted depths of the ocean to unlock its hidden treasures.

**What was the survey about?**

- The extensive survey and exploration activities have been conducted in the Central Indian Ocean Basin. These efforts have focused on the extraction of polymetallic nodules, rich deposits containing essential metals such as Nickel, Cobalt, Copper, and Manganese.
- These minerals are crucial for various industries, including electronics and renewable energy sectors.
- Moreover, the mission has cast its net wider, reaching out to the Central and South West Indian ridges.

**Findings:**

- The researchers have discovered promising locations indicative of hydrothermal activity and zones rich in sulphide mineralisation, which include valuable metals like Copper and Zinc.
- These findings are not just academic; they represent potential gateways to new resources that could significantly contribute to India's economy.
- The Deep Ocean Mission is not only about resource extraction but also about understanding and preserving marine biodiversity, assessing environmental impacts, and developing cutting-edge technologies for deep-sea exploration.
- India's ambitious Samudrayaan project also aims at exploring the deep ocean and its resources. It will send three personnel to a depth of 6000 meters in a submersible vehicle.

**Samudrayaan project:**

- The Samudrayaan project is expected to be realised by 2026 and is being designed and developed by the National Institute of Ocean Technology (NIOT) in Chennai.
- The submersible vehicle, named 'MATSYA 6000', has an endurance of 12 hours under normal operation and 96 hours in case of emergency for human

**ADDITIONAL ORGANIC MOLECULES FOUND IN ENCELADUS'S PLUME**

**Why in news?**

- Molecules including methanol, ethane, and oxygen are present in gaseous plumes emitted from Saturn's moon Enceladus, a re-analysis of data from the Cassini mission suggests.

**Background:**

- The Cassini spacecraft first discovered large plumes of material escaping into space from Enceladus's southern hemisphere in 2005.



- ⇒ These plumes appear to be coming from a subsurface ocean through fissures in the moon's icy surface.
- ⇒ Analyses of data from Cassini's Ion and Neutral Mass Spectrometer (INMS) collected during flybys in 2011 and 2012 determined the presence of water, carbon dioxide, methane, ammonia, and molecular hydrogen in the samples.

### Key findings:

- ⇒ Using a statistical analysis technique, which analysed billions of potential compositions of the plume material, they identified that the most likely composition of the plumes is the five already identified molecules along with newly identified hydrocarbons hydrogen cyanide (HCN), acetylene (C<sub>2</sub>H<sub>2</sub>), propylene (C<sub>3</sub>H<sub>6</sub>), and ethane (C<sub>2</sub>H<sub>6</sub>), and traces of an alcohol (methanol) and molecular oxygen.
- ⇒ A finding of the work is the find the definite presence of nitrogen at Enceladus in the form of HCN. "Previous studies have been unable to resolve the HCN abundance due to confounding signals from fragmentation products at mass 28," they write.
- ⇒ This compositionally diverse chemical reservoir under the surface of Enceladus may be consistent with a habitable environment and could potentially support microbial communities.

### Conclusion:

- ⇒ The ability of these compounds to support life on Enceladus, however, depends largely on how diluted they may be in the moon's subsurface ocean, the authors note.

## DRDO CARRIES OUT SUCCESSFUL FLIGHT TRIAL OF AUTONOMOUS FLYING WING TECHNOLOGY DEMONSTRATOR

### Why in news?

- ⇒ The Defence Research and Development Organisation (DRDO) has successfully carried out a flight trial of Autonomous Flying Wing Technology Demonstrator, an indigenous high-speed flying-wing Unmanned Aerial Vehicle (UAV) from the Aeronautical Test Range, Chitradurga in Karnataka.
- ⇒ With this flight in the tailless configuration, India has joined the elite club of countries to have mastered the controls for the flying wing technology.



### Key Highlights:

- ⇒ This UAV is designed and developed by DRDO's Aeronautical Development Establishment.
- ⇒ The maiden flight of this aircraft was demonstrated in July 2022, followed by six flight trials in various developmental configurations using two in-house manufactured prototypes.
- ⇒ These flight-tests led to achievements in development of robust aerodynamic and control system; integrated real-time and hardware-in-loop simulation, and state-of-the-art Ground Control Station.
- ⇒ The team had optimised the avionic systems, integration and flight operations towards the successful seventh flight in final configuration.

### Characteristic features:

- ⇒ The aircraft prototype, with a complex arrowhead wing platform, is designed and manufactured with light-weight carbon prepreg composite material developed indigenously.
- ⇒ Also, the composite structure, impregnated with fibre interrogators for health monitoring, is a showcase of 'Aatmanirbharta' in the aerospace technology.
- ⇒ The autonomous landing of this high-speed UAV, without the need for ground radars/infrastructure/pilot, showcased a unique capability demonstration, allowing take-off and landing from any runway with surveyed coordinates.
- ⇒ This was possible using onboard sensor data fusion with indigenous satellite-based augmentation using GPS Aided GEO Augmented Navigation (GAGAN) receivers to improve the accuracy and integrity of GPS navigation.

### Way Forward:

- ⇒ The successful development of such critical technologies indigenously will further strengthen the Armed Forces.

## INDIGENOUSLY BUILT UNIT-4 AT KAKRAPAR ATTAINS CRITICALITY

### Why in news?

- ⇒ The fourth unit of the Kakrapar Atomic Power Project (KAPP) in Gujarat started controlled fission chain reaction and thus became critical recently.



⇒ The project's units with a capacity of 700 MWe each are the largest indigenous nuclear power reactors to be built by Nuclear Power Corporation of India Ltd. (NPCIL), a public sector undertaking of the Department of Atomic Energy.

**Unit-3 of the KAPP:**

- ⇒ Unit-3 of the KAPP started generating commercial electricity from August 30. These reactors are pressurised heavy water reactors (PHWRs), which use natural uranium as fuel and heavy water as coolant and moderator.
- ⇒ The NPCIL is already operating indigenous PHWRs with 220-MWe and 540-MWe capacity at other facilities.
- ⇒ The reactor's first criticality was ascertained after it met all the conditions set out by the Atomic Energy Regulatory Board (AERB), India's nuclear safety watchdog.

**PHWRs at Kakrapar Atomic Power Station:**

- ⇒ The Kakrapar Atomic Power Station already has two operating PHWRs with a capacity of 220 MWe each, called KAPS-1 and -2.
- ⇒ The indigenously built 700-MWe reactors are among "the best reactors of this PHWR category".
- ⇒ They have many advanced safety features, including among others a steel-lining from the floor to the wall and a passive decay heat removal system to cool the fuel core.

**Fact:**

- ⇒ The NPCIL at present operates 23 nuclear electricity reactors with a total capacity of 7,480 MWe. It has nine units, including KAPP-4, under construction while 10 more reactors, with a total capacity of 7,000 MWe, are in the pre-project phase.

**INDIA'S FIRST WINTER ARCTIC EXPEDITION BEGINS**

**Why in news?**

- ⇒ The Raman Research Institute (RRI) is participating in the first winter Indian expedition to the Arctic region.
- ⇒ Its researchers would examine the characterisation of the radio frequency environment in the Svalbard region of the Arctic in Norway.



⇒ The survey will help astronomers assess the suitability of this uniquely located region for carrying out precision astronomy measurements.

**Details:**

- ⇒ India has been running its own research station, Himadri, in Svalbard since 2008. The winter expedition is a bid to maintain a year-long presence at the station.
- ⇒ A team of four scientists will embark on the journey to India's research station in Alesund town on the Brogger peninsula, where research institutes from 10 countries have laboratories.
- ⇒ Sensitive electronic instruments will be used to study the incoming radio signals in the frequency range of 5-500 megahertz (MHz) at the accessible sites in the vicinity of Himadri.
- ⇒ The RRI team was selected as the first batch of scientists who will conduct experiments spanning astronomy, climate change and atmospheric science.

**Nodal Agency:**

- ⇒ The month-long scientific expedition is being funded by the Earth Sciences Ministry.
- ⇒ The National Centre for Polar and Ocean Research, Goa, is the nodal agency spearheading the expedition.

**SARAS:**

- ⇒ The survey of the radio frequency environment had never been done before at the site and could potentially open avenues for deploying low-frequency radio telescopes in the region.
- ⇒ For nearly a decade now, engineers and scientists at the RRI have been working on the development of the shaped antenna measurement of the background radio spectrum (SARAS) series of experiments.
- ⇒ SARAS aims to study the faint cosmological signal from hydrogen, commonly referred to as the 21-cm signal, emerging from the cosmic dawn and the epoch of reionization.

**Cosmic dawn:**

- ⇒ Cosmic dawn denotes the period when the first stars and galaxies were born in the universe.
- ⇒ These are the two vital phases that the universe underwent during its early stages of evolution several billions of years ago.

⇒ These periods in cosmic history are not well understood due to a lack of observations.

**ISRO AWARDED LEIF ERIKSON LUNAR PRIZE FOR EXPLORING MOON WITH CHANDRAYANA-3**



**Why in news?**

- ⇒ The Indian Space Research Organisation (ISRO) has been awarded the prestigious Leif Erikson Lunar Prize by the Husavik Museum in recognition of the space agency's unwavering commitment and significant contributions to lunar exploration.
- ⇒ The award celebrates ISRO's successful Chandrayaan-3 mission, which has played a pivotal role in enhancing our understanding of celestial mysteries.

**Chandrayaan-3:**

- ⇒ Chandrayaan-3, India's latest lunar mission, marked a historic achievement as it successfully landed near the Moon's South Pole on August 23, 2023, making India the first country to accomplish this feat.
- ⇒ The mission's success is attributed to several technological advancements, including software enhancements that improved navigation algorithms, guidance systems, and fault tolerance mechanisms. These upgrades were crucial in ensuring a seamless descent and landing on the lunar surface.
- ⇒ The mission's lander, Vikram, equipped with the Chandra's Surface Thermophysical Experiment (ChaSTE), provided valuable data on the lunar surface temperature, reaching a depth of 10 centimeters below the surface.
- ⇒ Additionally, the Pragyan rover conducted in-situ experiments, further contributing to the wealth of knowledge about the Moon.

**About Leif Erikson Lunar Prize:**

- ⇒ The Leif Erikson Award is an annual prize given by the Exploration Museum since 2015.
- ⇒ It is named after Leif Erikson, a Norse explorer thought to be the first European to set foot on continental America, almost four centuries before the expedition of Christopher Columbus.
- ⇒ It honors those who have made significant strides in the field of lunar exploration.

**WHO TERMS COVID STRAIN JN.1 VARIANT OF INTEREST**

**Why in news?**

- ⇒ The World Health Organisation has classified COVID-19 strain JN.1 as a separate "variant of interest" given its rapidly increasing spread but said that it poses a "low" global public health risk.

**Details:**

- ⇒ The JN.1 variant was previously classified as a variant of interest (VOI) as part of the BA.2.86 sublineages, the parent lineage that is classified as a VOI.
- ⇒ However, in recent weeks, JN.1 continues to be reported in multiple countries, and its prevalence has rapidly increased globally.
- ⇒ India has also reported its first case of the JN.1 variant. It now represents the vast majority of BA.2.86 descendent lineages reported to the Global Initiative on Sharing All Influenza Data (GISAID).

**'Variant of Interest':**

- ⇒ A VOI typically refers to specific genetic markers that have been associated with changes to receptor binding.
- ⇒ This implies that variants of interest may be more difficult to treat, be at risk for more severe symptoms, or have a heightened rate of transmission.
- ⇒ However, these specific strains may appear in isolated regional cases and have yet to spread outside to other countries. Although, the WHO agrees to continue to monitor their development.

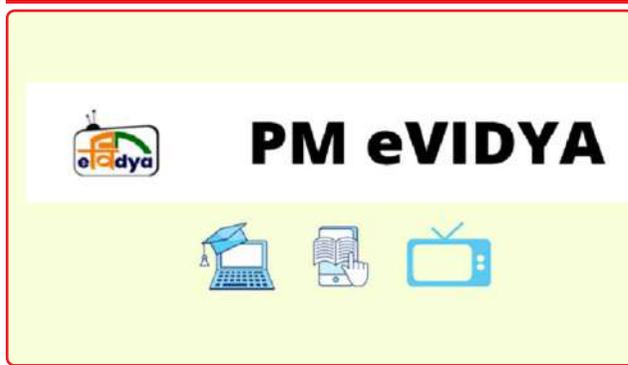
**'Variant of Concern':**

- ⇒ VOC's express similar attributes as 'variants of interest' but are more likely to be responsible for greater disease severity across the globe.

- At a higher risk for hospitalizations, these variants express more significant antibody responses and may produce a higher rate of infection or viral load.
- Furthermore, physicians may face increased difficulty in treatment as these strains show reduced effectiveness in pharmaceutical interventions or vaccines.
- Additionally, they are considered more highly transmissible making it easier to cross regional boundaries.

**SOCIAL ISSUES**

**STEPS TAKEN BY THE GOVERNMENT TO PROVIDE FREE OF COST DIGITAL TOOLS TO MARGINALISED COMMUNITIES**



**Why in news?**

- Recently, the Minister of State for Education, in a written reply in the Lok Sabha gave detail of steps taken by the Government to provide free of cost digital tools to marginalised communities.
- The National Education Policy 2020 calls for investment in digital infrastructure, online teaching platforms and tools, virtual labs, digital repositories, online assessments, technology and pedagogy for online teaching-learning etc., with the promotion of multilingualism and the power of language in teaching and learning through innovative and experiential methods.
- NEP (para 4.23) further mentions that certain subjects, skills, and capacities should be learned by all students.
- These skills also include digital literacy, coding, and computational thinking which are promoted through various digital initiative.

**PM e-VIDYA:**

- A comprehensive initiative called PM e-VIDYA was initiated as part of Atma Nirbhar Bharat Abhiyaan on 17th May, 2020, which unifies all efforts related to digital/online/on-air education to enable multi-mode access to education.
- The PM eVidya initiative are available to all the students across all the states free of cost.

**Key components:**

- DIKSHA the nation's digital infrastructure for providing quality e-content for school education in States/UTs and QR coded Energized Textbooks for all grades (one nation, one digital platform).
  - As per the Union Budget announcement for Financial Year 2022-23, the 12 DTH Channels have been expanded to 200 PM e-VIDYA DTH TV Channels to enable all States to provide supplementary education in various Indian languages for classes 1-12.
  - Extensive use of Radio, Community Radio and CBSE Podcast- Shiksha Vani.
  - Special e-content for visually and hearing impaired developed on Digitally Accessible Information System (DAISY) and in sign language on NIOS website/ YouTube.
  - To promote crucial critical thinking skill and to give space for creativity, it has been proposed to establish 750 virtual labs and 75 Skilling e-labs by 2023. The Virtual Labs are proposed for Science and Mathematics subjects for Classes 6th – 12th, and Skilling e-labs would provide for simulated learning environment.
  - A vertical on Virtual Labs has been created on DIKSHA platform. Training on Virtual labs has been conducted through PM eVidya DTH TV channels for teachers and teacher educators across the country.
- Other initiatives:**
- ICT and Digital initiatives component of centrally sponsored scheme of Samagra Shiksha covers Government and Aided schools having classes VI to XII. Under this component financial assistance is provided for establishing ICT Lab and Smart Classrooms in schools.
  - To assist students preparing for competitive exams across the country, a SATHEE portal has been developed in collaboration with IIT Kanpur. Feedback on the beta version of the platform is currently being collected from students from all over the country.

**HEALTH**

**IMPROVED DRUG REGIMENS FOR TB LIKELY TO REDUCE TREATMENT TIME**



**Why in news?**

- At the Union World Conference on Lung Health 2023, there was much optimism, as four new improved drug regimens that could cut treatment time for drug resistant tuberculosis by up to two thirds, were the primary source of this optimism.
- It is the long duration of treatment, and subsequent drug toxicity that leads to patients being unable to tolerate the drugs, and also non-compliance with treatment schedules. This ultimately leads to drug resistant TB.

**New Regimens:**

- On the opening day of the Union World Conference, three regimens were presented, as having achieved favourable outcomes in between 85-90% of participants for treatment of multidrug-resistant tuberculosis or rifampicin-resistant tuberculosis (MDR/RR-TB).
- Research led by Médecins Sans Frontières, Partners in Health, and Interactive Research and Development, found that a further fourth regimen showed a strong treatment response at 85.6% and represented an alternative for people who cannot tolerate bedaquiline or linezolid.

**Outcome:**

- These drug regimens for MDR/RR-TB "represent similar efficacy and safety to conventional treatments, but have reduced treatment time by up to two-thirds."
- Over 750 participants from 11 sites, 7 countries, and 4 continents were involved in the study, funded by Unitaid, on tackling MDR/RR-TB.
- The trial showed how combining antibiotics in new ways could treat this form of the disease more effectively than ever before, offering much-needed hope.

**Way Forward:**

- The researchers findings are a significant step and could address issues around access to and affordability of quality TB care, experts agree.

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### U.S. FDA APPROVES PAIR OF GENE THERAPIES FOR SICKLE CELL DISEASE

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**Why in news?**

- The U.S. Food and Drug Administration (FDA) recently approved a pair of gene therapies for sickle cell disease, including the first treatment based on the breakthrough CRISPR gene editing technology.

**Details:**

- It approved Lyfgenia from bluebird bio, and a separate treatment called Casgevy by partners Vertex Pharmaceuticals and CRISPR Therapeutics for the illness.
- Both the therapies were approved for people aged 12 years and older.
- The Vertex/CRISPR gene therapy uses the breakthrough gene editing technology that won its inventors the Nobel Prize in 2020.

**Sickle cell disease:**

- Sickle cell disease is a painful, inherited blood disorder that can be debilitating and lead to premature death. It affects an estimated 1, 00,000 people in the U.S., most of whom are Black.
- In sickle cell disease, the body makes flawed, sickle-shaped hemoglobin, impairing the ability of red blood cells to properly carry oxygen to the body's tissues.
- The sickle cells tend to stick together and can block small blood vessels, causing intense pain. It also can lead to strokes and organ failure.

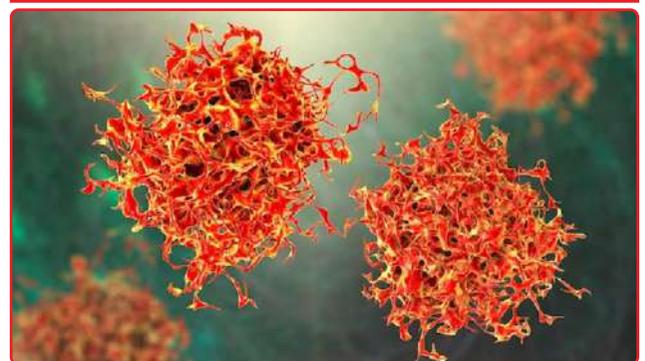
**Treatment:**

- Makers of both the therapies have pitched them as one-time treatments, but data on how long their effect lasts is limited.
- The only longer-term treatment for sickle cell disease is a bone marrow transplant.

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### INDIAN RESEARCHERS REVEAL KEY TO ENHANCING IMMUNITY AGAINST CANCER

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**Why in news?**

- Researchers at the Indian Institute of Science (IISc) have made a groundbreaking discovery that could significantly improve the effectiveness of cancer immunotherapy, a treatment that harnesses the body's immune system to combat cancer cells.
- The study delves into the intricate role of Interferon-gamma (IFN- $\gamma$ ), a cytokine critical for immune

response, and its interaction with various cancer cells.

### Why it matters?

- Cancer immunotherapy has been a beacon of hope for patients, offering a more targeted approach than traditional treatments like chemotherapy or radiation, which often harm healthy cells. However, the cost and varying efficiency of these therapies have posed challenges.
- The IISc team's research aimed to address these issues by investigating how different cancer cells respond to IFN- $\gamma$  activation.

### Apoptosis:

- Apoptosis, often referred to as programmed cell death, is a highly regulated and controlled process that occurs in multicellular organisms.
- The researchers observed that upon treating cancer cells with IFN- $\gamma$ , the cell growth medium turned yellow, indicating an acidic environment due to the release of lactic acid. This observation led them to explore the metabolic processes behind this phenomenon.
- They discovered that liver and kidney cancer cell lines ramped up their production of nitric oxide (NO) and lactic acid when activated by IFN- $\gamma$ , resulting in toxic reactive oxygen species (ROS) that can lead to cell death.
- Conversely, colon and skin cancer cell lines did not exhibit the same response, suggesting a potential resistance to immunotherapy.

### Observations made:

- To tackle this, the team experimented with various methods to induce lactic acid and NO production in these stubborn cells.
- The addition of potassium lactate proved to be a game-changer, significantly reducing the growth of even the non-responsive cancer cells.

### Way Forward:

- This finding was unexpected, as lactic acid is typically considered a metabolic waste product.
- They emphasised the need for further research in animal models to determine whether targeting metabolic pathways can enhance the anti-tumor effects of IFN- $\gamma$  during immunotherapy, particularly for cancers that are difficult to treat.

**HIGH-EFFICACY MALARIA VACCINE  
MANUFACTURED BY SERUM INSTITUTE  
PASSES WHO QUALITY CHECKS**

### Why in news?

- A malaria vaccine manufactured by the Serum Institute of India has passed the next round of regulatory approval by the World Health Organization (WHO).



- The R21/Matrix-M malaria vaccine developed by the University of Oxford and the Indian company meets the WHO standards for vaccine quality, safety and efficacy.

### Details:

- R21/Matrix-M malaria was added to the WHO's list of prequalified vaccines.
- The vaccine was recommended for use for the prevention of malaria in children by the global health agency on October 2, 2023.

### WHO List of Prequalified Vaccines:

- If a vaccine has undergone thorough evaluation of relevant data, testing of samples and WHO inspection of relevant manufacturing sites it is included in the WHO List of Prequalified Vaccines.
- The WHO also tests the vaccine's suitability for the target population, usability with appropriate concomitant products and compliance with operational specifications for packaging and presentation.
- The prequalification means larger access to vaccines as a key tool to prevent malaria in children, with it being a prerequisite for vaccine procurement by United Nations Child Rights body UNICEF and funding support for deployment by Gavi, the Vaccine Alliance.

### Significance of R21/Matrix-M malaria:

- The vaccine is highly effective and can reduce malaria cases by 75 per cent over a year. Prior to this, the best vaccine had a 50 per cent success rate over a year and a lower success rate over three years.
- Further, Serum Institute can produce hundreds of millions of doses of this vaccine each year.
- The vaccine will also be cheaper, priced at around \$5 per dose at high volumes.

### Way Forward:

- The R21 vaccine is the second malaria shot approved by WHO, following the RTS,S/AS01 one, which was approved in July 2022.
- In clinical trials, both vaccines have been shown to be safe and effective in preventing malaria in children.
- The vaccines are expected to have a large public health impact when widely implemented alongside other recommended malaria control interventions.

## CULTURE

## GARBA OF GUJARAT, DECLARED AS INTANGIBLE CULTURAL HERITAGE BY UNESCO



## Why in news?

- 'Garba of Gujarat' has been inscribed in the Representative List of Intangible Cultural Heritage (ICH) of Humanity by UNESCO, under the provisions of the 2003 Convention for the Safeguarding of Intangible Cultural Heritage.
- It was decided during the 18th meeting of the Intergovernmental Committee for the Safeguarding of the Intangible Cultural Heritage from 5th -9th December, 2023 in Kasane, Botswana.

## India's elements in UNESCO's representative list of ICH:

- With this, 15 elements from various parts of India have been inscribed to UNESCO's representative list of ICH.
- The 14 other elements from India that have been inscribed to UNESCO's representative list of ICH are Ramlila; yoga; vedic chanting; Kutiyattam, Sanskrit theatre of Kerala; Ramman, religious festival and ritual theatre of the Garhwal Himalayas; Mudiyyettu, ritual theatre and dance drama of Kerala; Kalbelia folk songs and dances of Rajasthan; Chhau dance of eastern India; Buddhist chanting of Ladakh; Sankirtana, ritual singing, drumming and dancing of Manipur; traditional brass and copper craft of utensil making in Punjab; Nawrouz; Kumbh Mela and Durga Puja in Kolkata.

## About Garba:

- Garba is a "ritualistic and devotional dance" that is performed on the occasion of the festival of Navratri which is dedicated to the worship of the feminine energy or 'Shakti'.
- The dance takes place around a perforated earthenware pot lit with an oil lamp, or an image of the mother goddess Amba. The dancers move around the centre in a counter-clockwise circle, using simple movements while singing and clapping their hands in unison.

- Starting with slow circular movements, the tempo slowly builds up to a frenzied whirling. The practitioners and bearers of Garba are broad and inclusive, from the dancers to the musicians, social groups, craftspeople and religious figures involved in the festivities and preparations.
- Garba fosters social equality by diluting socio-economic, gender and religious structures. It continues to be inclusive of diverse and marginalized communities, thus strengthening social bonds.

## Listing mechanism:

- The Listing mechanism under the UNESCO 2003 Convention aims to enhance the visibility of intangible cultural heritage, fostering awareness of its significance and promoting dialogue that respects cultural diversity.
- India was elected to be part of the 24 Member Intergovernmental Committee (IGC) of the ICH 2003 Convention in 2022 for a tenure of 4 years.
- Alongside India, 2023 Intergovernmental Committee (IGC) comprised of Angola, Bangladesh, Botswana, Brazil, Burkina Faso, Côte d'Ivoire, Czechia, Ethiopia, Germany, Malaysia, Mauritania, Morocco, Panama, Paraguay, Peru, Republic of Korea, Rwanda, Saudi Arabia, Slovakia, Sweden, Switzerland, Uzbekistan and Vietnam.

## AMRIT DHAROHAR CAPACITY BUILDING SCHEME 2023



## Why in news?

- Recently, the Ministry of Tourism (MoT) in collaboration with Ministry of Environment, Forest & Climate Change (MoEFCC) launched an Alternative Livelihood Programme under the Amrit Dharohar Capacity Building Scheme-2023 in Sultanpur National Park, a Ramsar Site in Haryana.

## Details:

- Under this initiative, IITTM, an autonomous body under MoT, in collaboration with MoEFCC will build the capacity of local community members around different Ramsar sites in order to strengthen nature tourism at these sites and provide alternative livelihood to the local community.
- With the help of State Forest Deptt., a total of 30 participants have been identified from the local

communities located around Sultanpur Bird Sanctuary to impart this training and subsequently certify them as nature-guides.

**Amrit Dharohar:**

- Amrit Dharohar initiative, part of the 2023-24 budget announcement, was launched by MoEF&CC during June 2023 to promote unique conservation values of the Ramsar Sites in the country while generating employment opportunities and supporting local livelihoods.
- This initiative is to be implemented in convergence with various Central Government ministries and agencies, State Wetland Authorities, and a network of formal and informal institutions and individuals, working together for a common cause.

**Nature-tourism and Wet component:**

- The Nature-tourism and Wet component of this initiative is being implemented jointly by MoT and MoEFCC with an aim to enhance livelihood opportunities for local communities through harnessing the nature-tourism potential of the Ramsar Sites across the country.
- Sultanpur is one of the five priority Ramsar Sites besides Bhitarkanika and Chilika in Odisha and Yashwant Sagar and Sirpur in Madhya Pradesh identified in first phase by MoT and MoEFCC for taking up training programmes for local communities under the Alternative Livelihood Programme (ALP).

**UNESCO RECOGNISES KEMPEGOWDA T2 AS ONE OF WORLD MOST BEAUTIFUL AIRPORTS**



**Why in news?**

- Kempegowda International Airport Bengaluru has earned prestigious accolades at UNESCO's 2023 Prix Versailles.
- The Terminal 2 (T2) secured recognition as one of the 'World's most beautiful airports' and was awarded the coveted 'World special prize for an interior 2023.'

**Key features of Terminal 2 (T2):**

- Terminal 2 of the Bengaluru International Airport earlier received the prestigious IGBC platinum certification by the Indian Green Building Council under the IGBC Green New Building Rating system

- In phase 1, T2 is designed to accommodate 25 million passengers per annum (MPPA), aligning with its vision of blending functionality with aesthetic appeal.
- T2 aims to be a visual delight to all passengers with its insightfully curated art and decor elements that are part of its recently launched art programme that promises to be awe-inspiring making passengers' journey through the terminal an unforgettable experience.
- The sustainable design of T2, the world's largest terminal pre-certified with a platinum lead rating by the US Green Building Council before operational commencement, reflects the airport's commitment to environmental responsibility.

**About Prix Versailles awards:**

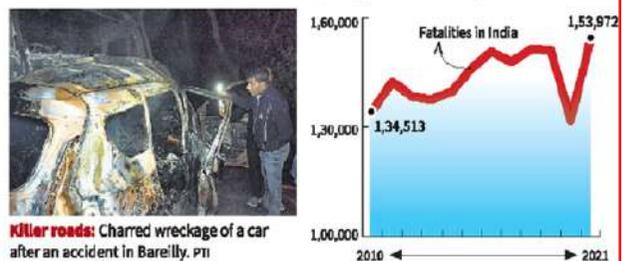
- The Prix Versailles awards were established in 2015.
- It is announced each year at UNESCO.
- The award is given for outstanding achievements in architecture and design on a global scale.
- The award focuses on intelligent sustainability as a cultural driver, acknowledging innovation, creativity, reflection of local heritage, ecological efficiency and values of social interaction.

**MISCELLANEOUS**

**ROAD FATALITIES RISE IN INDIA, DESPITE GLOBAL DROP, WHO**

**Deadlier roads**

Road traffic-related fatalities in India reached a 11-year high in 2021 after a dip in 2020



**Why in news?**

- Recently, the World Health Organization (WHO) released a report titled, the 'Global Status Report on Road Safety 2023'.

**Details:**

- Road traffic deaths fell by 5% to 1.19 million annually worldwide between 2010 and 2021, with 108 United Nations member countries reporting a drop.
- India, however, registered a 15% increase in fatalities.
- The total number of road traffic fatalities in India went up to 1.54 lakh in 2021 from 1.34 lakh in 2010.

**Decline in road fatality:**

- Ten countries succeeded in reducing road traffic deaths by over 50%. These are Belarus, Brunei Darussalam, Denmark, Japan, Lithuania, Norway, Russian Federation, Trinidad and Tobago, the United

- Arab Emirates, and Venezuela. Thirty-five countries made notable progress, reducing road traffic deaths by 30% to 50%.
- As of 2019, road crashes were the leading cause of deaths among children and youth aged five to 29 years, and were the 12th leading cause of deaths when all ages are considered. Two-thirds of deaths occurred among people of a working age.
  - In the past decade, a 5% reduction in absolute numbers of road traffic fatalities was accompanied with a growth in the global population by nearly 14 billion, or roughly 13%.
  - This translates into the road fatality rate declining from 18 per 1 lakh people in 2010 to 15 per 1 lakh in 2021, which represents a 16% decline in the road traffic death rate since 2010.

#### Vehicle growth:

- During the same period, the global motor vehicle fleet grew 160%. Therefore, annual fatality rates per 1 lakh vehicles fell from 79 deaths to 47 deaths, which is a 41% reduction.

#### Global road traffic deaths:

- The report shows that 28% of global road traffic deaths occurred in the WHO's South-East Asia Region, 25% in the Western Pacific Region, 19% in the African Region, 12% in the Region of the Americas, 11% in the Eastern Mediterranean Region, and 5% in the European Region.
- Nine in 10 deaths occur in low- and middle-income countries, and fatalities in these countries are disproportionately higher when set against the number of vehicles and roads they have.
- The risk of death is three times higher in low-income than high-income countries, yet low-income countries have just 1% of the world's motor vehicles.

### ACTIVIST ALI ABU AWWAD AND PIANIST DANIEL BARENBOIM WIN INDIRA GANDHI PEACE PRIZE



#### Why in news?

- Classical pianist Daniel Barenboim and peace activist Ali Abu Awwad have been named the winners of the Indira Gandhi Prize for Peace, Disarmament and Development for 2023.

- They have been awarded for their efforts in bringing together the youth and people of Israel and the Arab world for a non-violent resolution of the Israel-Palestine conflict.
- They have fostered meaningful, mutual social and cultural understanding, and peaceful public cooperation through the tools of music, dialogue, and people's participation.

#### Barenboim:

- Mr. Barenboim is an Argentine-born classical pianist and conductor, renowned for performing with and directing some of the leading orchestras in the world.
- Apart from his musical achievements, he is known for his efforts to use music to foster harmony in West Asia.
- His friendship and partnership with renowned Palestinian literary scholar Edward Said shaped his vision of a peaceful resolution of the Israel-Palestinian conflict through respect, discourse and dialogue.
- For his humanitarian efforts in cultural education and integration, Barenboim was awarded several accolades, including Germany's Great Cross of Merit, Spain's Prince of Asturias Award, and France's Commander of the Legion of Honour.

#### Award:

- Mr. Awwad is a Palestinian peace activist who has been working tirelessly with the people of Palestine and Israel for a peaceful resolution of the ongoing conflict.
- Born in 1972, he was raised in a politically-active refugee family. Unable to meet each other while in prison for three years, he and his mother undertook a 17-day hunger strike, which resulted in achieving permission for a visit.
- This success was a watershed moment in Abu Awwad's realisation that non-violent action along Gandhian principles could be the way forward for achieving one's goals of freedom and dignity.
- In 2014, Mr. Awwad co-founded a local Palestinian-Israeli initiative called Roots, promoting understanding, non-violence and transformation.
- His peace-building efforts led to the creation of a Palestinian non-violence movement called Taghyeer which was launched by more than 3,000 Palestinians across the West Bank in September 2016.

#### About Indira Gandhi Peace Prize:

- The Indira Gandhi Prize for Peace, Disarmament, and Development was instituted in the memory of the former prime minister by a trust in her name in 1986.
- It consists of a monetary award of 25 lakh rupees along with a citation.
- The award is given to individuals or organisations that work towards ensuring international peace and development, ensuring that scientific discoveries are used to further the scope of freedom and better humanity, and creating a new international economic order.

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## PRACTICE QUESTION FOR UPSC PRELIMS EXAM

1. Consider the following statement regarding Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY):
  1. It was launched by the Indian government as a response to the COVID-19 pandemic.
  2. It is designed to provide financial assistance to economically weaker sections affected by the pandemic.
  3. The scheme encompasses the distribution of 15 kg of free food grains each month.
 Choose the correct option from the codes given below:
 

a) 1 and 2	b) 2 and 3
c) 1 and 3	d) 1, 2 and 3
  
2. Consider the following statement regarding Acquired immune deficiency syndrome (AIDS):
  1. It is a non-chronic disease.
  2. It is caused by the human immunodeficiency virus (HIV).
  3. It can also be spread from mother to child during pregnancy.
 Choose the correct option from the codes given below:
 

a) 1 and 2	b) 2 and 3
c) 1 and 3	d) 1, 2 and 3
  
3. Consider the following statement regarding INS Kadmat:
  1. It is an indigenous stealth anti-submarine warfare corvette.
  2. It has been named after the Kadmat Island of India's Lakshadweep Islands.
 Choose the correct option from the codes given below:
 

a) 1 Only	b) 2 Only
c) 1 and 2	d) None of the above
  
4. Consider the following statement regarding Asola Bhatti Wildlife Sanctuary:
  1. It is part of the Sariska-Delhi Wildlife Corridor.
  2. The vegetation falls under the Northern Tropical Thorn Forests type
  3. The native plants exhibit xerophytic adaptations.
 Choose the correct option from the codes given below:
 

a) 1 and 2	b) 2 and 3
c) 1 and 3	d) 1, 2 and 3
  
5. Consider the following statement regarding Santjordia Pagesi:
  1. It is considered "rare" and has been found only in the Ogasawara Islands in Japan.
  2. "Santjordia" refers to Saint George in Catalan.
  3. It does not fall under the category of fish.
 Choose the correct option from the codes given below:
 

a) 1 and 2	b) 2 and 3
c) 1 and 3	d) 1, 2 and 3
  
6. Consider the following statement regarding Piezoelectricity:
  1. It is a material known for its association with static electricity.
  2. This property is the result of their unusual crystal structures.
  3. Molecules are not distorted even if stress is applied.
 Choose the correct option from the codes given below:
 

a) 1 and 2	b) 2 and 3
c) 1 and 3	d) 1, 2 and 3
  
7. Consider the following statement regarding Cholelithiasis:
  1. It is a major risk factor for blood cancer.
  2. Gallstones are hardened deposits of digestive fluid that form in the gallbladder.
  3. It is a common hepatobiliary condition affecting mostly Western populations.
 Choose the correct option from the codes given below:
 

a) 1 and 2	b) 2 and 3
c) 1 and 3	d) 1, 2 and 3
  
8. Consider the following statement regarding sub-Neptune planets:
  1. They could be rocky worlds with thick atmospheres of hydrogen and helium gas.
  2. These planets have radii between those of the Earth and Neptune.
 Choose the correct option from the codes given below:
 

a) 1 Only	b) 2 Only
c) 1 and 2	d) None of the above







- a) 1 and 2 only                      b) 2 and 3 only  
c) 1 and 3 only                      d) 1, 2 and 3
40. With reference to the India Cooling Action Plan (ICAP), which of the following statements is/are correct?  
1. ICAP seeks to Reduce cooling demand across sectors by 20% to 25% by 2037-38.  
2. The plan was launched in 2023.  
Select the correct answer using the code given below:  
a) 1 only                                  b) 2 only  
c) Both 1 and 2                      d) Neither 1 nor 2
41. Consider the following statement regarding River Cities Alliance:  
1. The Alliance is open to all river cities of India.  
2. It focuses on three broad themes- Networking, Capacity Building and Technical Support.  
3. It is a first-of-its-kind Alliance in the world launched by Ministry of Jal Sakti only.  
Choose the correct option from the codes given below:  
a) 1 and 2                                  b) 2 and 3  
c) 1 and 3                                  d) 1, 2 and 3
42. Consider the following statement regarding PM Formalisation of Micro food processing Enterprises (PMFME) Scheme:  
1. This scheme is operational for a period of three year.  
2. The scheme is a centrally sponsored scheme launched in 2020.  
3. 60:40 ratios with UTs with legislature, and 100% by Centre for other UTs.  
Choose the correct option from the codes given below:  
a) 1 and 2                                  b) 2 and 3  
c) 1 and 3                                  d) 1, 2 and 3
43. Consider the following statement regarding Interest Equalisation Scheme (IES):  
1. The scheme shall be implemented by the RBI through various Public and non-Public Sector banks.  
2. The scheme is primarily meant for the labour-intensive sectors.  
Choose the correct option from the codes given below:  
a) 1 Only                                  b) 2 Only  
c) 1 and 2                                  d) None of the above
44. Consider the following statement regarding Koya Tribe:  
1. They live on both sides of the Godavari River.  
2. Most Koya speak either Gondi or Telugu.  
3. They reside in the states of Andhra Pradesh, Madhya Pradesh and Orissa.  
Choose the correct option from the codes given below:  
a) 1 and 2                                  b) 2 and 3  
c) 1 and 3                                  d) 1, 2 and 3
45. Consider the following statement regarding *Mesechinus orientalis*:  
1. It is a new species of Hedgehog.  
2. It can be found in scrubland and subtropical broad-leaf evergreen forests.  
3. It is a large-bodied hedgehog.  
Choose the correct option from the codes given below:  
a) 1 and 2                                  b) 2 and 3  
c) 1 and 3                                  d) 1, 2 and 3
46. Consider the following statement regarding Electric eel:  
1. It is a fish that only lives in freshwater areas.  
2. They emit a weak electric signal, which they use like radar to navigate, to find a mate, and to find prey.  
3. IUCN status is critically endangered.  
Choose the correct option from the codes given below:  
a) 1 and 2                                  b) 2 and 3  
c) 1 and 3                                  d) 1, 2 and 3
47. Consider the following statement regarding Syphilis:  
1. It is caused by virus.  
2. It is a Sexually Transmitted Infection.  
3. Syphilis spreads from person to person through direct contact with these sores.  
Choose the correct option from the codes given below:  
a) 1 and 2                                  b) 2 and 3  
c) 1 and 3                                  d) 1, 2 and 3
48. Consider the following statement regarding National Mission for Clean Ganga (NMCG):  
1. It is a registered society under the Ministry of Jal Shakti.  
2. It acted as the implementation arm of the National Ganga River Basin Authority (NGRBA).  
Choose the correct option from the codes given below:  
a) 1 Only                                  b) 2 Only  
c) 1 and 2                                  d) None of the above
49. Consider the following statement regarding Goldilocks Effect:  
1. It is the premise that people are inclined to seek 'just the right' amount of something.  
2. It applies to elements of psychology, hard sciences, economics, marketing and engineering.  
3. People prefer something that is neither too extreme nor too moderate but falls within an optimal or desirable range.  
Choose the correct option from the codes given below:  
a) 1 and 2                                  b) 2 and 3  
c) 1 and 3                                  d) 1, 2 and 3













- Which of the above statement(s) is/are correct?  
 a) 1 only                                      b) 2 only  
 c) Both 1 and 2                              d) Neither 1 nor 2
116. How does INSACOG primarily contributes to our understanding of the SARS-CoV-2 virus?  
 a) By expanding whole genome sequencing of the virus  
 b) By organizing public health awareness campaigns  
 c) By establishing quarantine facilities  
 d) By conducting clinical trials for COVID-19 treatments
117. With reference to Tribunals in India, consider the following:  
 1. The High Court exercises superintendence over all tribunals throughout its jurisdiction.  
 2. Only Parliament is empowered to constitute Administrative Tribunals both at the central and state levels.  
 3. Tribunals in India are composed only of judicial members appointed by the central government.  
 How many of the above statements are correct?  
 a) Only one                                      b) Only two  
 c) All three                                      d) None
118. Consider the following statements regarding the Project PRAYAS:  
 1. It is an initiative of the International Organisation for Migration.  
 2. It aims to facilitate safe and regular migration for Indian migrant workers and students.  
 Which of the statements given above is/are correct?  
 a) 1 only                                      b) 2 only  
 c) Both 1 and 2                              d) Neither 1 nor 2
119. Pantoea Tagorei, recently seen in the news, is a:  
 a) Virus                                      b) Mollusk  
 c) Drug                                      d) Bacteria
120. Consider the following statements regarding the Turquet's octopuses:  
 1. It is mainly found in the Antarctic region.  
 2. It is listed as critically endangered species under the IUCN Red List.  
 Which of the statements given above is/are correct?  
 a) 1 only                                      b) 2 only  
 c) Both 1 and 2                              d) Neither 1 nor 2
121. Consider the following statement regarding New Jumping spiders:  
 1. Their abdomens are light brown and display white bands formed of white hairs that cover it laterally.  
 2. They are widespread from Africa to Australia with various known species found in Middle East also.  
 3. They have revealed the presence of the genus in North eastern Himalayan region.  
 Choose the correct option from the codes given below:  
 a) 1 and 2                                      b) 2 and 3  
 c) 1 and 3                                      d) 1, 2 and 3
122. Consider the following statement regarding Reindeer:  
 1. Only male reindeer grow antlers.  
 2. These are the only mammals known to see ultraviolet light.  
 3. Conservation status by IUCN is Vulnerable.  
 Choose the correct option from the codes given below:  
 a) 1 and 2                                      b) 2 and 3  
 c) 1 and 3                                      d) 1, 2 and 3
123. Consider the following statement regarding Epulopiscium Viviparus:  
 1. It is a bacteria which live symbiotically in the guts of a fish.  
 2. It has plentiful enzymes that make ATP.  
 Choose the correct option from the codes given below:  
 a) 1 Only                                      b) 2 Only  
 c) 1 and 2                                      d) None of the above
124. Consider the following statement regarding NASAMS (National Advanced Surface-to-Air Missile System):  
 1. It is a medium-range ground-based air defence system.  
 2. It is best suited to defend important stationary assets, such as key military assets, infrastructure, or cities.  
 3. It is operated by 13 countries.  
 Choose the correct option from the codes given below:  
 a) 1 and 2                                      b) 2 and 3  
 c) 1 and 3                                      d) 1, 2 and 3
125. Consider the following statement regarding Strait of Gibraltar:  
 1. It is a narrow waterway separating Europe from Africa.  
 2. An important port located on the strait is the Moroccan port of Tanger-Med, near Tangier.  
 3. It connecting the Pacific Ocean to the Atlantic Ocean.  
 Choose the correct option from the codes given below:  
 a) 1 and 2                                      b) 2 and 3  
 c) 1 and 3                                      d) 1, 2 and 3



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## PRACTICE QUESTION FOR UPSC MAINS EXAM

1. When did Lok Sabha and State Assembly elections start happening at different points in time? What are the arguments for and against conducting simultaneous elections for Lok Sabha, State Assemblies and local bodies? What are the constitutional impediments?
2. In India, perverse incentives created by public institutions and the skill gap among officials have eroded the ability to form and implement sound policies. Comment.
3. Has health been discussed in previous UN Conference of Parties? What are the expected health-related outcomes at COP-28? How can public health become resilient to climate change, and who will finance this transformation? What challenges do experts foresee?
4. What are the grounds on which the Parliamentary Standing Committee on Home Affairs recommended to re-criminalise the offence which was revoked from the Indian Penal Code in 2018? What is the history of the adultery law in India?
5. What are the likely Opportunities and Challenges posed by the India-UK Free Trade Agreement? What are the likely impact of the India-UK FTA on the partner countries?
6. What did the Intergovernmental Negotiating Committee (INC), under the United Nations Environment Programme, in its third round of negotiations discuss? How do they aim to end plastic pollution? What did the 'zero draft' say and was it endorsed by the end of the meeting?
7. What are privileges committees? Discuss the role of ethics committee. How to reconcile privileges of the House and democratic representation?
8. Why are deepfakes dangerous? How are deepfakes being used to spread misinformation in political campaigns? What are the international best practices? What should be the regulatory response according to experts?
9. Close collaboration between India and Australia can pave the way to extract critical minerals by undertaking seabed mining in a responsible and sustainable manner. Elaborate.
10. Where do the Particularly Vulnerable Tribal Groups live in India? What is their population? Why is so little known about them? When was the last count done? How is the Pradhan Mantri-Janjati Adivasi Nyaya Maha Abhiyan (PM-JANMAN) scheme expected to benefit PVTGs?
11. Discuss how due to the changing global conditions, the erstwhile export-led growth strategy may not be available to India any more. Also discuss strategies for India on relying relatively more on domestic growth drivers.
12. Give a brief detail of the world's first comprehensive laws to regulate the use of artificial intelligence formed by the European Union.
13. Indigenous peoples represent 6 per cent of the world's population are at the frontlines of the climate crisis. Discuss the impact of climate change on lives, livelihoods and food security of the Indigenous peoples.
14. The Article 370 judgment, shaped by constitutional monism, raises critical concerns about its impact on federalism in India. Comment.
15. The 2023 UN Climate Change Conference was recently in Dubai, United Arab Emirates (UAE). What were the most important decisions and where they fell short? Highlight some key resolutions on fossil fuels, methane emissions, funds to fight global warming, among others discussed at COP 28.
16. After repeated flooding in Chennai, the key issue now is to decode Chennai's urban and peri-urban hydrology, its ecosystem in its totality, and make meaningful and scientific interventions. Elaborate.
17. What are the key aspects of the judgment and how will it affect Centre-State relations? What has the Supreme Court ruled about the President's role during President's rule? What did it say about restoring statehood to Jammu & Kashmir?
18. What does The Chief Election Commissioner and other Election Commissioners (Appointment, Conditions of Office and Terms of Office) Bill, 2023 passed by the Rajya Sabha say? How is the new mechanism different from the one spelled out by the Supreme Court?
19. Discuss how in a creative interpretation of Article 200, the Chief Justice of India's recent judgment has also protected the entire constitutional system from the depredations of Governors?
20. Combined with nutrition literacy and effective food labelling, tax on High-Fat Sugar Salt (HFSS) foods can help improve health outcomes. Elaborate.
21. What came of the first global stocktake at 2023 Conference of Parties? What were the novel mechanisms introduced with respect to accelerating green finance? Why did India not sign the health and methane reduction declarations?
22. What are the key features and issues of the Post Office Bill, 2023? What do prior Supreme Court rulings say about the state's surveillance powers? What have experts opined?

23. What are green credits and what opportunities do they present? Discuss how it's a way to turn eco-friendly aspirations into tangible actions, planting the seeds for a greener future worldwide?
24. How does the government plan to consolidate the law for wireless networks and Internet service providers? Has the licensing procedure been eased for telecom operators? What are the concerns raised by digital rights groups?
25. Why were the British-era criminal laws in India proposed to be replaced by revised Bills, and what were the main legislative areas targeted for change? How does the inclusion of UAPA's definition of a 'terrorist act' in the Bharatiya Nyaya (Second) Sanhita Bill, 2023 differ from the previous definition included in the original Bill?
26. Implementing Global Goal on Adaptation (GGA), needs more urgency in terms of treating adaptation on a par with mitigation in the face of extreme climate events. Comment and Discuss.



## PRACTICE QUESTION FOR UPSC PRELIMS EXAM

### ANSWER KEY

1. (a) 2. (b) 3. (c) 4. (d) 5. (a) 6. (a) 7. (b) 8. (c) 9. (d) 10. (a)  
 11. (a) 12. (b) 13. (c) 14. (d) 15. (a) 16. (a) 17. (b) 18. (c) 19. (d) 20. (a)  
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 121. (a) 122. (b) 123. (c) 124. (d) 125. (a)

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