



# DIKSHANT TODAY

FEBRUARY 2023



## What's special

- ⇒ Jallikattu: Cultural practice or Cruelty?
- ⇒ Indian Telegraph (Infrastructure Safety) Rules 2022
- ⇒ SC demonetisation verdict
- ⇒ Endorsement guidelines for Celebs and Social Media Influencers
- ⇒ India Australia Economic Cooperation and Trade Agreement
- ⇒ International Year of Millets (IYM) 2023
- ⇒ Sovereign Green Bonds
- ⇒ IPCC Working Group III Report highlight
- ⇒ Practice Question For Upsc Pre. & Mains Exam



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## FEBRUARY 2023

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## POLITY & GOVERNANCE

### HOW IS INDIA MOVING TO REGULATE ONLINE GAMING?



#### Why in news?

- The Ministry of Electronics and Information Technology (MeitY) has released draft amendments in relation to online gaming. The idea is to ensure that online games are in conformity with Indian laws and to safeguard users against potential harm.
- The draft proposes a self-regulatory mechanism which, in future, may also regulate the content of online gaming.

#### What changes are being proposed?

- The proposals are aimed at safeguarding the interests of users by introducing set procedures and norms for verification and user engagement.
- The draft proposal defines what constitutes an 'online game'. It is "a game that is offered on the internet and is accessible by a user through a computer resource if he makes a deposit with the expectation of earning winnings". 'Winning' constitutes any prize, in cash or kind, intended to be given to the participant "on the performance of the user and in accordance with the rules of such online game".
- This addresses the discourse in the sector about the definitions of a 'game of skill' and 'game of chance'. The term 'game of skill' had been used in the Public Gambling Act (1867) but had not been defined.

#### Greater transparency:

- The game operators would have to verify users on the platform and provide them with the terms of services.
- For the monetary aspect of it, operators would have to inform the user about the policy related to withdrawal or refund of their deposit, measures taken for its

protection, the manner and distribution of winnings and the fees and other charges to be paid by the user.

- They would also have to be informed about the risk of potential financial loss and addiction associated with the game. The self-regulating bodies' framework must also include safeguards to protect children.
- Addiction is to be combated using repeated warning messages should the user exceed a reasonable duration while playing a certain game.

#### What about the platforms?

- Before hosting or publishing a game, the platform would have to verify it from the self-regulatory body it is associated with. It would then be required to carry a registration mark on all its recognised online games.
- The platform is expected to appoint a key management personnel or senior employee as its Chief Compliance Officer who would be entrusted with coordinating with law enforcement agencies to ensure compliance with their orders or requisitions.
- In addition to this, the platforms are also expected to additionally appoint a 'Nodal Contact Person' to facilitate the necessary coordination at any point of the day. Further, it must have in place an appropriate mechanism for receipt and resolution of grievances.
- The complainant must be able to track the status of the same using a unique ticket number. The gaming intermediaries must have a physical address in the country which must be published on its website and app.

#### What about the self-regulating bodies?

- MeitY is entrusted with the responsibility of recognising and if required, unrecognising all self-regulated bodies under the proposed framework.
- The applications of the desirous candidates would be examined on criterions including the number of companies who are its members, its track record in promoting responsible online gaming, the absence of conflict of interest and suitability of its board of directors.
- The latter must be independent and eminent people in the space with relevant expertise in public policy, public administration, psychology, medicine or consumer education, online gaming or any other relevant field.
- The self-regulatory bodies would also be assessed for their capacity in terms of deployment of technology, expertise and other relevant resources to ensure compliance from members.

- ⇒ They are required to examine a game in light of the member's adherence to due diligence norms and relevant laws.

### What are some of the concerns?

- ⇒ Despite appreciating the government's move to introduce these new rules, some experts are concerned about certain discrepancies in the new initiative.
- ⇒ The rules still bucket all gaming intermediaries into a broad category irrespective of size or risk.
- ⇒ They all require similar compliances, including the need to have India based officers. This can disproportionately burden young start-ups, and make it difficult for global players to start their services in India.

### What are some other countries doing to regulate online gaming?

- ⇒ China has placed strict limits on the time young people may spend playing online games. Online gaming in the country is now only available to people younger than 18 from 8 p.m. to 9 p.m. on Fridays, Saturdays, Sundays and public holidays.
- ⇒ Before an online game can be distributed in China, it must obtain approval and an International Standard Book Number (ISBN) from China's National Press and Publication Administration (NPPA).
- ⇒ In the U.S., Internet casino gaming remains illegal in every state that doesn't explicitly legalise the games.
- ⇒ Germany's "Youth Protection" laws aimed at violent games pushed developers to replace realistic red blood with a green version, for example, and Australia has sought to ban games for including depictions of everything from assault to marijuana use.

## NO NEED FOR EXTRA CURBS ON FREE SPEECH OF MINISTERS: SC



### Why in news?

- ⇒ The Supreme Court recently, held that there is no reason to impose "additional restrictions" on the right to free speech of Ministers, and the government is not vicariously liable for disparaging remarks made by them, even if the comments are traceable to state affairs or meant to protect the government.

### Justice B.V. Nagarathna's view:

- ⇒ In a separate opinion, Justice B.V. Nagarathna differed with the leading judgment on the point, saying a Minister's statement, if traceable to any affairs of the state or for protecting the government, can be attributed vicariously to the government by invoking the principle of collective responsibility, "so long as such statement represented the view of the government too".
- ⇒ If such a statement is not consistent with the view of the government, then it is attributable to the Minister personally.

### PM, CMs have no disciplinary control over members of the Council of Ministers:

- ⇒ A Prime Minister or a Chief Minister in a country where there is a multi-party system cannot afford to crack the whip every time a Minister makes a statement which may either be in bad taste or disparaging.
- ⇒ The bench said a "strong Prime Minister or Chief Minister will be able to drop any Minister out of the Cabinet", but "in a country like ours where there is a multiparty system and where coalition governments are often formed, it is not possible at all times for a Prime Minister/Chief Minister to take the whip, whenever a statement is made by someone in the Council of Ministers".
- ⇒ Governments which survive on wafer-thin majority sometimes have individual Ministers who are strong enough to decide the very survival of such governments. This problem is not unique to our country.

### Conclusion:

- ⇒ The four judges said their observations did not mean that any public official, including a Minister, could get away after making irresponsible statements, even bordering on hate speech.
- ⇒ They were only discussing whether the government could be held vicariously liable under the principle of "collective responsibility" for the disparaging statements of a Minister.
- ⇒ Answering the question in the negative, it said the collective responsibility was that of the Council of Ministers.

## WHY HAS A HIGH-POWER LADAKH COMMITTEE BEEN FORMED?

### Why in news?

- ⇒ Recently, the Ministry of Home Affairs (MHA) constituted a high-powered committee chaired by Minister of State for Home Nityanand Rai for the Union Territory of Ladakh.
- ⇒ The committee will discuss measures to protect the region's unique culture and language taking

into consideration its geographical location and strategic importance; ensure protection of land and employment for the people of Ladakh; strategise inclusive development and discuss issues related to the empowerment of the Ladakh Autonomous Hill District Councils of Leh and Kargil.



### Why was the committee formed?

- Civil society groups in Ladakh have been demanding protection of land, resources and employment for the past three years after the special status of the erstwhile State of Jammu and Kashmir under Article 370 of the Constitution was read down by Parliament on August 5, 2019.
- The fear of big businesses and conglomerates taking away land and jobs from the local people have contributed to this demand.

### What is the sixth schedule?

- The sixth schedule under Article 244 of the Constitution protects the autonomy of tribal populations through creation of autonomous development councils which can frame laws on land, public health and agriculture. As of now ten autonomous councils exist in Assam, Meghalaya, Tripura and Mizoram.
- As per the 2011 Census, the total population of Ladakh was 2,74,289, and nearly 80% of them are tribals.

### What is the background?

- In 2020, the Peoples Movement for Constitutional safeguard under the sixth schedule or the Apex Body, Leh was formed. They announced that they would boycott the upcoming district autonomous council elections if their demands were not met.
- In the same year, the Apex Body and the Kargil Democratic Alliance (KDA) from the two districts of Leh and Kargil in Ladakh came together to jointly fight for constitutional safeguards for the region.
- On August 2, 2022, the two bodies renewed their demand to seek full Statehood for Ladakh. The UT has shut down at least twice and protested several occasions in the past three years over these demands.
- However, members of the new committee state that the MHA order instituting the committee is not clear as it avoids any mention of the primary demand for inclusion under the sixth schedule of the Constitution.

### What is the government's stand?

- Not keen to give any special status to Ladakh, the MHA informed a parliamentary standing committee recently that the objective for inclusion of tribal population under the sixth schedule is to ensure their overall socio-economic development, which, the UT administration has already been taking care of and that sufficient funds are being provided to Ladakh to meet its overall developmental requirements.
- A report tabled in Rajya Sabha said that the Ladakh administration recently increased the reservation for the Scheduled Tribes in direct recruitment from 10% to 45% which will significantly help the tribal population in their development.

### JALLIKATTU: CULTURAL PRACTICE OR CRUELTY?



#### Context:

- With the Supreme Court recommencing its work, all eyes in Tamil Nadu are on the verdict of a five-member Constitution Bench of the Court on a batch of petitions seeking to strike down a 2017 Tamil Nadu law that protects jallikattu, a traditional event involving bulls.

#### How did the current litigation begin?

- A massive agitation erupted on the Marina beach in Chennai in January 2017, demanding that the Central and State governments come up with a law that would annul the Supreme Court's ban on jallikattu which was imposed, through a judgment in May 2014 in the Animal Welfare Board of India vs A. Nagaraja case.
- Apart from demanding that the event be allowed again, the protesters had raised the issue of "redeeming Tamil identity and culture."
- It was against this context that the law in question was then enacted originally in the form of an Ordinance, the Prevention of Cruelty to Animals (Tamil Nadu Amendment) Ordinance 2017.
- The Assembly had subsequently adopted a Bill to replace the Ordinance which resulted in the Court being moved and the case referred to the Constitution Bench in February 2018.

### How is the case being presented now?

- The primary question involved is whether jallikattu should be granted constitutional protection as a collective cultural right under Article 29 (1), a fundamental right guaranteed under Part III of the Constitution to protect the educational and cultural rights of citizens.
- The court examined if the laws, the Prevention of Cruelty to Animals (Tamil Nadu Amendment) Act of 2017 and the Prevention of Cruelty to Animals (Conduct of Jallikattu) Rules of 2017 “perpetuate cruelty to animals” or were actually a means to ensure “the survival and well-being of the native breed of bulls”.
- This assumes relevance in the context of the Court quashing in 2014 the Tamil Nadu Regulation of Jallikattu Act, 2009, which had allowed jallikattu.
- The Court had then talked of how bulls were being “tortured to the hilt” in the process of performing for the event. The apex court then scrutinised the question of whether the new jallikattu laws were “relatable” to Article 48 of the Constitution which urged the state to endeavour to organise agriculture and animal husbandry on modern and scientific lines.
- The Constitution Bench also looked into whether jallikattu and bullock-cart race laws of Karnataka and Maharashtra would actually sub-serve the objective of “prevention” of cruelty to animals under the Prevention of Cruelty to Animals Act of 1960.

### What were the arguments adduced for and against jallikattu?

- In Tamil Nadu, jallikattu is both a religious and cultural event celebrated by the people of the State and its influence extends beyond the confines of caste and creed.
- A practice which is centuries-old and symbolic of a community's identity can be regulated and reformed as the human race evolves rather than being completely obliterated,” the State government submitted.
- It added that any ban on such a practice would be viewed as “hostile to culture and against the sensitivities of the community.
- Describing jallikattu as “a tool for conserving this precious indigenous breed of livestock,” the government argued that the traditional event did not violate principles of compassion and humanity.

### Arguments by the petitioner:

- The petitioners' line of argument was that animal life was inextricably connected to the lives of humans. Liberty was “inherent in every living being, whether it be in any form of life,” an aspect that had been recognised by the Constitution.
- The Tamil Nadu law was brought to circumvent the ban on jallikattu imposed by the Supreme Court.

- Placing their position on media reports about deaths and injuries caused to humans as well as bulls which had taken place in several districts of the State while conducting jallikattu, the petitioners contended that contrary to the arguments advanced by Tamil Nadu, several tamers pounced on bulls.
- Also, there was no material to justify jallikattu as a part of culture. The critics had equated the event with practices such as sati and dowry, which were also once recognised as part of culture and stopped through legislation.

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### CABINET APPROVES CONTINUATION OF SCHEMES OF MINISTRY OF DEVELOPMENT OF NORTH EASTERN REGION

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#### Why in news?

- The Union Cabinet has approved continuation of Schemes of Ministry of Development of North Eastern Region, with an outlay of ₹12882.2 crore, for the balance period of the 15th Finance Commission (2022-23 to 2025-26).

#### Outlay:

- Based on the Expenditure Finance Committee (EFC) recommendations, the outlay for the North East Special Infrastructure Scheme (NESIDS) will be Rs.8139.5 crore including committed liabilities of ongoing projects.
- The outlay for ‘Schemes of NEC’ will be Rs.3202.7 crore including committed liabilities of ongoing projects. The outlay for Special Packages for BTC, DHATC and KAATC in Assam is Rs.1540 (BTC- Rs 500 crore, KAATC – Rs 750 crore and old packages of BTC, DHATC & KAATC – Rs 290 crore).
- The NESIDS, a Central Sector Scheme with 100% Central funding, has been restructured having two components – NESIDS (Roads) and NESIDS (Other than Road Infrastructure).

#### Objective:

- The Ministry's new scheme “Prime Minister's Development initiative for the north eastern region - PM-Devine” (with an outlay of Rs.6, 600 crore), has been approved earlier in october-2022 separately, under which larger and high impact proposals under infrastructure, social development and livelihood sectors are taken.
- The objectives of the schemes of the MDoNER is to supplement the efforts of the different Central Ministries & Departments on one hand and the felt needs of the NE Region States on the other, for uncovered development/welfare activities.
- The MDoNER Schemes help provide gap-filling support to the eight North Eastern States as per their felt needs, by taking up projects – e.g., for developing infrastructure to mitigate connectivity and social sector deficits and enhancing livelihood and employment opportunities in the region.

### Extension of the approved schemes for the balance of the 15th finance commission period, i.e. up to fy 2025-26, would

- Enable better planning for implementation of the schemes in terms of project selection,
- Front loading of sanction of the projects, and
- Project implementation during the scheme period

#### Implementation:

- Efforts will be made to complete maximum number of the projects by 2025-26 so that there are minimum committed liabilities beyond this year. Therefore, schemes would have new sanctions in 2022-23 and 2023-24 primarily; while expenditure would continue to be incurred during 2024-25 and 2025-26 focused attention will be given to complete the ongoing sanctioned projects.

#### Way Forward:

- The Five pillars of the Atmanirbhar Bharat Abhiyan for self-reliant India, namely, Economy, Infrastructure, System, Vibrant Demography and Demand will get a push through the scheme.

### DEPARTMENT OF TELECOMMUNICATIONS FORMULATES THE INDIAN TELEGRAPH (INFRASTRUCTURE SAFETY) RULES 2022



#### Why in news?

- The Department of Telecommunications under the Ministry of Communications has formulated the Indian Telegraph (Infrastructure Safety) Rules 2022.
- Digital Infrastructure and Services are increasingly emerging as key enablers and critical determinants of a country's growth and well-being.

#### Background:

- The Central government has therefore envisioned fulfilling the communication needs of the citizens and enterprises through establishment of a resilient, secure, accessible and affordable Digital Communications Infrastructure and Services.
- Government/ TSPs/ IPs together have established the much-required pan India telecom infrastructure networks for various telecom sector issues of concern.
- Various agencies often undertake excavation

activities wherein underground utility assets get damaged wither due to lack of knowledge of agencies about existing utilities or lack of coordination with utility asset owner agencies.

- These damages cause economic loss to utility asset owners as well as business loss and inconvenience to the public. In Telecom Sector alone, there are nearly 10 lakh OFC cuts per year causing an economic loss of approx. Rs 3000 Crore/year.

#### Salient features:

- Any person wishes to exercise a legal right to dig or excavate any property which is likely to cause damage to a telegraph infrastructure shall give notice to the licensee, prior to commencement, through common portal.
- The information shall include the name and address of the person exercising the legal, agency details, contact details, date and time of start of the exercise, description and location of the exercise, and the reasons for such dealing.
- The licensee shall, as expeditiously as possible, provide through the common portal, the details of telegraph infrastructure owned/ controlled/ managed by them, falling under/ over/ along the property with which the person intends to deal, alongwith precautionary measures for coordination in avoiding damages to the telegraph infrastructure.
- Excavators/utility asset owners will be given alerts via SMS, email and in-app notification and will also have the facility of 'Click to call' from the app itself.
- The person digging or excavating shall take appropriate action on precautionary measures provided by the licensee.
- In case no licensee provides details within the prescribed time, the person having legal right to dig or excavate shall be free to dig or excavate the property thereafter.
- Further, any person, who has dug/excavated any property causing damage to a telegraph infrastructure, shall be liable to pay the damage charges to the telegraph authority. The damage charges shall be computed based on such expenses as may be incurred in restoring damages.
- Once the asset owner agencies map their underlying assets with GIS coordinates on PM GatiShakti NMP platform, it will also be possible to know the presence of underlying utility assets, at the point of interest, before start of excavation.

#### Advantages (For Government – Central & State/ UTs):

- Many utilities can be saved from unwanted cuts and wasteful cost towards restoration, thus saving thousands of crores for businesses and associated tax loss to Govt.

**Advantages (For Citizens):**

- Inconvenience caused to citizens because of frequent breakdown may be reduced due to better synergy between the agencies.

**A STEP TOWARDS FIGHTING CORRUPTION****Context:**

- In a judgment in December 2022, *Neeraj Dutta v. State (Govt. of NCT of Delhi)* the Constitution Bench of the Supreme Court came down heavily on corruption among public servants in the country and lowered the bar for the quantum of evidence required to convict persons charged with corruption.
- This verdict was hailed by those who desire probity in public administration and demand deterrent penalties for criminal activities.
- This was not the first time that the Supreme Court was speaking on endemic corruption in system; but in spite of its unequivocal stand, the extent of corruption in public life remains undiminished.

**Judgement:**

- Through its ruling, the Supreme Court debunks the myth that absolute proof of guilt alone can help convict an offender. The court has now laid down that even if prosecution witnesses turn hostile, a conviction would be in order if all the circumstantial evidence marshalled by the prosecution and produced before the court points unmistakably to the guilt of the accused.
- This is a great step towards ensuring integrity in public services, especially in the 'superior' services such as the Indian Administrative Service and Indian Police Service.
- There are two aspects to the fight against corruption: the severity of the law and its application; and the strength of public opinion that would help carry forward the campaign for a clean public life.

**Preponderance of probability:**

- The Supreme Court has set the standard of 'preponderance of probability', a yardstick that is usually not acceptable to sustain conviction in criminal trials. Earlier, the belief was that only conclusive proof, namely, proof that does not leave an

iota of doubt in the minds of the courts, was required. This has now been diluted.

- The court has directed that infirmities such as non-availability of the complainant, either because he is dead or otherwise not traceable, should not stand in the way of accepting the story of the prosecution.
- The same liberal application of the law of evidence will now apply to cases where prosecution witnesses turn hostile, either because of inducement or intimidation.
- It is well known that some powerful people are accused of 'buying' prosecution witnesses. Some lawyers have also been part of this, bringing shame to the criminal justice system and to the bar. The apex court is aware of this and believes it can no longer be a mute spectator.

**Will this judgment alter the face of corruption?**

- The corrupt public servants will find other means of covering up their misdeeds. This is because many are willing to offer bribes to public servants, either on their own or on demand. This nexus between offender and victim has become a part of our ethos.
- It is undeniable that the misdeeds of public servants are partly attributable to political corruption. The current situation in many States has become so bad that no service to which a citizen is entitled as a fundamental right can be obtained without greasing the palm of someone in the administrative or political hierarchy.
- Jobs are often sold at a price. Many applicants are prepared to pay without a complaint as there is acute unemployment. No approval for construction of a building or for registration of a property is possible without payment of a bribe. This situation has only worsened in many States.
- Several public servants involved in this racket cite illegal and rapacious demands from the political hierarchy as the reason for such bribes. Whether this is really the case or not, many corrupt officials in the administration are willing conduits and avail themselves of the opportunity to line their pockets.

**Way Forward:**

- The latest Supreme Court judgment may not deter people from corruption. However, that is no reason to give up the fight. It is here lies the need for enlightened opinion leaders who are not scared of taking on powerful elements in politics or in administration.

**SC DEMONETISATION VERDICT: WHAT IS DELEGATED LEGISLATION?****Why in news?**

- In upholding the Centre's 2016 decision on demonetisation, one of the key questions to decide for the Supreme Court was whether Parliament gave excessive powers to the Centre under the law to demonetise currency.



- ⇒ While the majority ruling upheld the validity of the delegated legislation, the dissenting verdict noted that excessive delegation of power is arbitrary.

### What is delegated legislation?

- ⇒ Parliament routinely delegates certain functions to authorities established by law since every aspect cannot be dealt with directly by the law makers themselves. This delegation of powers is noted in statutes, which are commonly referred to as delegated legislations.
- ⇒ The delegated legislation would specify operational details, giving power to those executing the details. Regulations and by-laws under legislations are classic examples of delegated legislation.

### What was the delegation of power in the demonetisation case?

- ⇒ Section 26(2) of the Reserve Bank of India Act, 1934 essentially gives powers to the Centre to notify that a particular denomination of currency ceases to be legal tender.
- ⇒ Here, Parliament, which enacted the RBI Act, is essentially delegating the power to alter the nature of legal tender to the central government.
- ⇒ The Centre exercised that power by issuing a gazette notification, which is essentially the legislative basis for the demonetisation exercise.

### Why was this challenged?

- ⇒ The petitioner's challenge was this: "In the event that Section 26(2) is held to permit demonetization, does it suffer from excessive delegation of legislative power thereby rendering it ultra vires the Constitution?"
- ⇒ The Constitution gives law-making powers to the Parliament. While operational aspects can be delegated to statutory bodies, essential powers cannot be delegated. Also, the delegation must be with sufficient guidelines on how the power can be used.
- ⇒ The petitioners in the demonetisation case argued that since Section 26(2) contains no policy guidelines on how the Centre can exercise its powers, it is arbitrary and therefore, unconstitutional.

### Why is excessive delegation power an issue?

- ⇒ A 1959 landmark ruling in Hamdard Dawakhana v

Union of India, the Supreme Court had struck down delegation of powers on the grounds that it was vague.

- ⇒ A Constitution Bench considered the validity of certain provisions of the Drug and Magic Remedies (Objectionable Advertisements) Act that prohibited advertisements of certain drugs for treatment of certain diseases and dealt with the powers of search, seizure and entry.
- ⇒ The Court held that the central government's power of specifying diseases and conditions as given in Section 3(d) is 'uncanalised', 'uncontrolled', and going beyond the permissible boundaries of valid delegation. Hence, the same was deemed unconstitutional.
- ⇒ The Court applies the "policy and guideline" test to decide the constitutionality of the delegated legislation.
- ⇒ The Attorney General for India argued that the RBI Act itself has guidance for exercise of delegated powers. He cited the Preamble and Section 3 of the Act as guidance on the purpose of the law and the Centre's role in "regulating" monetary policy.
- ⇒ Section 3 deals with establishment and incorporation of Reserve Bank.

### What did the Court decide?

- ⇒ The majority verdict held that since the delegation of power is to the Centre which is anyway answerable to the Parliament, the delegation power cannot be struck down.
- ⇒ The dissenting opinion, however, disagreed with this view. First, Justice BV Nagarathna held that Centre could not have exercised its delegated powers because Section 26(2) of the RBI only gives powers to the Centre when the recommendation is "initiated" by the RBI Central Board.
- ⇒ The judge held that it is clear that the proposal originated from the Centre and therefore the Centre could not have drawn its powers to demonetise from Section 26(2).
- ⇒ The dissenting view also held that, even if the Centre has the power under Section 26(2) allowing for demonetisation of "any" notes is a vast power that is arbitrary and therefore unconstitutional.
- ⇒ Justice Nagarathna emphasised that demonetisation of all series of notes, at the instance of the central government, is far more serious than the demonetisation of particular series by the bank, mandating the need for a legislation as opposed to an executive action.

## THE STALEMATE BETWEEN TELANGANA AND AP

### Context:

- ⇒ More than eight years after the bifurcation of the erstwhile united Andhra Pradesh, division of assets and liabilities between the two States remain elusive

as the States make their own interpretation of the provisions under the Andhra Pradesh Reorganisation Act 2014.

- Several bilateral meetings between the two States as well as those convened by the Union Home Ministry failed and the Andhra Pradesh government has now approached the Supreme Court seeking “just, reasonable and equitable apportionment” of assets and liabilities.



**What are AP government's claims?**

- The AP Government is firm on the implementation of the recommendations given by the expert committee headed by retired bureaucrat Sheela Bhide for bifurcation of 89 out of the 91 Schedule IX institutions.
- But it lamented that the Telangana government had selectively accepted the recommendations leaving others which was resulting in delays in division of assets and liabilities.

**What did the expert committee say?**

- The committee has made recommendations with respect to the division of 89 out of the 91 Schedule IX institutions.
- Its recommendations on the division of assets that are not a part of the headquarter assets attracted criticism from the Telangana government which said it is against the spirit of the Reorganisation Act.
- The division of several institutions like the RTC headquarters and the Deccan Infrastructure and Landholdings Limited (DIL) which have huge land parcels in its possession have become the key bone of contention between the two States.
- The committee, for instance, recommended the division of RTC workshops and other assets which do not come under the definition of ‘headquarter assets’. Telangana opposes these divisions. The land parcels held by the DIL do not come under the provisions of the Act either, Telangana contended.

**What is the stand of Telangana?**

- The Telangana government has contended that the expert committee’s recommendations were against the interests of Telangana. There is a clear definition of division of headquarter assets in Section 53 of the Reorganisation Act.
- The government is firm that the assets located outside the erstwhile united State like Andhra Pradesh

Bhavan in New Delhi could be divided between the States on the basis of population as per the provisions of the Act.

**What is the role of the Centre?**

- Several meetings of the dispute resolution committee headed by the Union Home Secretary and comprising of the Chief Secretaries of the two States and those convened by the dispute resolution sub-committee headed by the Home Ministry’s joint secretary could not break the impasse.
- The Act empowers the Union Government to intervene as and when needed.

**OFFICE OF REGISTRAR-GENERAL OF INDIA FOLLOWS ‘OBSOLETE’ CRITERIA FOR SCHEDULING OF TRIBES**



**Why in news?**

- The Office of the Registrar-General of India (RGI) is following the set of criteria set out by the Lokur Committee nearly 60 years ago to define any new community as a Scheduled Tribe.
- The Office of the RGI’s nod is mandatory for the inclusion of any community in ST lists, as per the procedure for scheduling tribes.

**Details:**

- In response to a query under the Right to Information Act, 2005, the Office of the RGI said, “For criteria, report of the Advisory Committee on the revision of the lists of Scheduled Castes and Scheduled Tribes (Lokur Committee 1965) is consulted.”
- This comes even as the government, until December, 2017, insisted in Parliament that it was considering a proposal to change the criteria for scheduling of new communities as STs based on the report of an internal task force.
- The criteria set out by the Lokur Committee for defining a community as a tribe are: indications of primitive traits, distinctive culture, geographical isolation, shyness of contact with the community at large, backwardness.

**Task Force:**

- The government task force on Scheduling of Tribes constituted under the leadership of then Tribal

Affairs Secretary, Hrusikesh Panda in February 2014, had concluded that these criteria “may have become obsolete considering the process of transition and acculturation”.

- It noted that terms like primitive and the requirement of primitivity to be a characteristic of Scheduled Tribe indicates a condescending attitude by outsiders.
- It also pointed out problems with the geographical isolation criterion, arguing that as infrastructure development continued across the country, “how can any community remain in isolation”?

### Recommendations:

- The Task Force had recommended changes to the criteria in May and based on this, the Tribal Affairs Ministry had in June 2014 prepared a draft Cabinet note to overhaul the criteria and procedure for scheduling of new communities as STs.
- The new criteria under the government's consideration included, “Socio-economic, including educational, backwardness, vis-a-vis, the rest of the population of the State; Historical geographical isolation which may or may not exist today; Distinct language/dialect; Presence of a core culture relating to life-cycle, marriage, songs, dance, paintings, folklore; Endogamy, or in case of exogamy, marital relationship primarily with other STs.”

### Limitations of Lokur Committee criteria:

- Now, with the Office of the RGI saying it continues to follow the criteria set out by the Lokur Committee in 1965, the fate of the proposal to change the criteria hangs in the balance.
- The Office of the RGI has said that it relies on census publications, which go back to 1891, along with materials provided by the nodal Union ministry and State governments, and then decides whether a community can be categorised as ST based on the Lokur Committee criteria.
- The task force led by Mr. Panda had said that in addition to the Office of RGI not having adequate anthropologists and sociologists to take such decisions, it also lacked the data for it, noting that inconsistencies in census records dating that far back presented more problems for categorisation based on the Lokur Committee's criteria.
- For instance, it noted that the 1891 census described tribes as people with a “tribal religion”; the 1901 and 1911 censuses described them as “tribal animists”; in 1921, they were called “hill and forest tribes”; in 1931, they were documented as “primitive tribes”; and were classified as “tribes” in 1941, before moving to the Constitutional term of “Scheduled Tribes” in 1951.
- The same task force had also recommended changes to the “cumbersome” procedure for scheduling of tribes followed since 1999, which it said along with the “obsolete” criteria was hindering over 40

communities from being included in ST lists across States.

### What's next?

- In November 2022, the Union government had put the proposal to change the procedure on hold and decided to continue with the existing one, which gives utmost primacy to the opinion of the Office of the RGI.

## THE BUCK STOPS WITH THE GOVERNMENT TO STOP HATE SPEECH, HATE CRIMES: SUPREME COURT



### Why in news?

- The Supreme Court recently said the “buck ultimately stops with the government” to clamp down on hate speech and hate crimes, as they are offences committed on the society.
- The government agreed that hate could not hide behind the colour of any religion.

### Background:

- The remarks from the Bench came after Uttar Pradesh informed the court that it had registered 580 cases of hate speech in 2021-2022. Of these, 160 were suo motu registered by the police.
- Uttarakhand said that it had registered 118 cases.

### TV channels:

- During the hearing, the court highlighted the problem of hate speech on television.
- It said that TV channels and their anchors have become tools to peddle particular “agendas” through the powerful visual medium, creating divisiveness and violent instincts in the society to win their TRP (or television rating point) wars.
- Asking whether any anchor has been “taken off air” to send a message against triggering hate or bias on TV, the court said that “if freedom is exercised with an agenda or to promote an agenda, you are not actually serving the people but some other cause. Then you have to be dealt with.”
- The court said that the anchors and the editorial heads of the channels decided the content, adding that it was also dictated by the “money” behind the channels.

**Name-calling is denigrating:**

- ⇒ Justice Joseph said that he found it denigrating how TV channels resorted to “name-calling”. He referred to the man accused of urinating on a fellow passenger in an Air India flight in this regard.
- ⇒ “The type of words used against him... He is an undertrial. Please do not denigrate anyone. Dignity is also part of Article 21 (right to life),” said Justice Joseph.
- ⇒ The exercise of free speech by one could not violate the right to dignity and free speech of others.

**Media must self-regulate:**

- ⇒ Additional Solicitor General said that the government intervened against the media only in “exceptional circumstances”. The onus was on the media to self-regulate and exercise prior restraint.
- ⇒ The government was considering legislation and even “comprehensive” amendments to the Code of Criminal Procedure to address the issues highlighted by the court.
- ⇒ Meanwhile, individuals wronged could avail of either the mechanisms under the Indian Penal Code or the defamation law.

**Indian Constitution and hate speech:****Freedom of Speech and Expression:**

- ⇒ It is protected as a fundamental right in the Constitution of India under Article 19(1) (a) which states that all citizens shall have the right to freedom of speech and expression.

**Article 19(2):**

- ⇒ A reasonable restriction has been put forth by the Indian constitution where the word reasonable should strike a balance between the use and misuse of this freedom.

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**WHAT DOES THE CENTRE WANT  
IN BHOPAL GAS CASE?**


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**Why in news?**

- ⇒ The Union of India calls the Bhopal gas leak tragedy the world's largest industrial disaster. On the intervening night of December 2-3, 1984, methyl isocyanate (MIC) gas escaped from the Union Carbide India Limited

(UCIL) plant in Bhopal, Madhya Pradesh, leading to hundreds of deaths.

- ⇒ Thirty-nine years after the incident, a Constitution Bench of the Supreme Court led by Justice S. K. Kaul has reserved its judgment on a curative petition filed by the Centre in November 2010 to enhance the \$470 million (about ₹725 crore at the then exchange rate) compensation fixed in a 1989 settlement reached with Union Carbide Corporation (UCC), now a wholly owned subsidiary of Dow Chemicals, with the imprimatur of the apex court.
- ⇒ The government has sought an additional amount of ₹675.96 crore in compensation from the pesticide company. The UCC has refused to pay a “farthing more”. The court made it clear that it would not “try” the curative petition like an ordinary suit and reopen the settlement.

**What is the basis for the plea for more compensation?**

- ⇒ The basis of the \$470 million settlement reached on May 4, 1989 was that there were only around 3,000 death cases in the gas leak incident. The government's curative petition in 2010 said the actual figure is 5,295 deaths.
- ⇒ However, a fortnightly report submitted by the Welfare Commissioner, Bhopal Gas Victims, and which is a part of the case records in the Supreme Court, shows the number of deaths have increased to 5,479 as on December 15, 2022. The Commissioner's report further said the number of cases of cancer and renal failure were 16,739 and 6,711, respectively.
- ⇒ The government's chart in the apex court shows that the total number of cases of deaths, disability, injuries, loss of property and livestock have increased to 5,74,376 from the 2,05,000 “assumed” on May 4, 1989.

**Is more relief possible in a curative petition?**

- ⇒ The firm stand voiced by the Constitution Bench against re-opening the 1989 settlement between the government and UCC finds its roots in the limits placed on curative jurisdiction.
- ⇒ The curative plea is a remedy evolved by the Supreme Court in the 2002 judgment in the Ashok Hurra versus Rupa Hurra case. It is the rarest-of-rare remedies when “the duty to do justice shall have to prevail over the policy of certainty of a judgment and declining justice would be oppressive to judicial conscience and perpetuate an irremediable injustice”.
- ⇒ A party can take only two limited grounds in a curative petition; one, that he or she was not given an opportunity to be heard, and two, that the judges were biased.
- ⇒ A curative petition, which follows the dismissal of the review petition, is the last legal avenue open in the Supreme Court. The government had not filed a review petition, but directly came for curative relief in 2010.

### What are the rival contentions?

- Attorney General of India has urged the court to look beyond the conservative principles of law, that is, look beyond the restrictions of the curative jurisdiction, to deliver complete justice to the victims by directing the UCC to pay up. He has argued that the government did not want to “re-open” the 1989 settlement but “add” to it.
- The government said the Parliament had placed it in the role of the protector of the victims by enacting the Bhopal Gas Leak Disaster (Processing of Claims) Act of 1985. It has an obligation to protect the victims’ interests “effectively and equitably”.
- The UCC, through senior advocate Harish Salve, countered that the settlement was arrived at on the basis of a “consent decree” sourced from a suit. If the decree was set aside, the suit proceedings should be restored.
- The liability of UCC for the tragedy was never established. There was no “re-opener clause” in the settlement. More and more liability cannot be piled on to his client as and when fresh data was revealed.

### What did the court observe during the hearing?

- At the heart of the legal dispute is a paragraph from the October 3, 1991 order of the Supreme Court. The paragraph discussed the “unlikely event” of the 1989 settlement funds being found insufficient to satisfy the claims of all the victims.
- While stressing that the victims should not be left to “fend for themselves”, the court, in 1991, had said the “reasonable way to protect the interests of the victims is to hold that the Union of India, as a welfare state and in the circumstances under which the settlement was made, should not be found wanting in making good the deficiency, if any”.
- The government has interpreted these words by saying that it has done its duty by coming to the court with a plea to direct the UCC to top-up the compensation amount. The court, in turn, said if the government, as a welfare state, felt the victims were entitled to more, it should pay them.

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## CASE IN SUPREME COURT: CAN AN UNDERAGE MUSLIM GIRL MARRY AFTER ATTAINING PUBERTY?

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### Why in news?

- Recently, the Supreme Court agreed to examine a decision of the Punjab and Haryana High Court holding that a Muslim girl can marry a person of her choice after attaining puberty.
- A bench headed by Chief Justice of India D Y Chandrachud said the HC’s decision should not be relied on as a precedent in any other case.
- In October 2021, another bench of the Supreme Court had agreed to hear an appeal on the case. The SC

intervention opens up the issue of regulating the minimum age of marriage for women and the impact it has on personal law.

### What is the Punjab and Haryana HC ruling?

- In October 2021, the Punjab and Haryana High Court while hearing a Habeas Corpus petition ruled that a Muslim girl is free to marry a person of her choice after attaining puberty, unless she is under the age of 18.
- A 26-year-old Muslim man who had married a 16-and-a-half-year-old girl had moved the High Court seeking custody of his spouse. The Punjab police had taken custody of the girl since she was a minor.
- The girl told the Panchkula magistrate in her statement under Section 164 of the Code of Criminal Procedure that she “had run away from her house along with the present petitioner out of her own will and has performed Nikah with the present petitioner in a Mosque.
- Under these circumstances, the HC allowed the marriage of the girl as per her free, especially since under Muslim law, a girl can be married after attaining puberty.

### What is the Muslim law on the age of marriage for a woman?

- The HC ruling quoted the Principles of Mohammedan Law by Sir Dinshah Fardunji Mulla, on the capacity for marriage. It states:

#### Capacity for marriage:

- Every Mahomedan of sound mind, who has attained puberty, may enter into a contract of marriage.
- Lunatics and minors who have not attained puberty may be validly contracted in marriage by their respective guardians.
- A marriage of a Mahomedan who is of sound mind and has attained puberty, is void, if it is brought about without his consent.

### What is the challenge?

- The National Commission for Protection of Child Rights had moved the Supreme Court against the HC ruling. Solicitor General Tushar Mehta, appearing for the child rights’ body, argued that the High Court’s ruling essentially allowed a child marriage, and this was in violation of the Prohibition of Child Marriage Act, 2006.
- The plea argued that the Child Marriage Act is a secular legislation and would apply to all religions, overriding their personal law.

### What is the law on child marriage?

- Under the Prohibition of Child Marriage Act, 2006, any marriage below the prescribed age of 18 years for women and 21 for men is illegal, and the perpetrators of a forced child marriage can be punished. However, child marriages are illegal but not void.

- It is voidable at the option of the minor party. This means, the marriage can be declared void by a court only if the minor party petitions the court.
- The NCPDR also argued that since the Protection of Children from Sexual Offences Act, 2012 does not recognise consent for sexual activity by minors, marriages on attaining puberty cannot be allowed.
- In 2021, the Centre introduced a Bill to increase the age of marriage for women, and ensure harmony in the age limit across religions.

### What is the proposed law?

- Union Minister for Women and Child Development Smriti Irani had introduced a Bill in the Lok Sabha to amend the Prohibition of Child Marriage Act, 2006 to increase the age of marriage for women, and ensure harmony in the age limit across religions. The Bill was subsequently referred to a Parliamentary Standing Committee.
- During the debate, the Indian Union Muslim League said the Bill was unconstitutional and was violative of Article 25 of the Constitution, which guarantees the freedom of conscience and free profession, practice and propagation of religion.

## CENTRE RELEASES ENDORSEMENT GUIDELINES FOR CELEBS AND SOCIAL MEDIA INFLUENCERS



### Why in news?

- Recently, the Department of Consumer Affairs under Ministry of Consumer Affairs, Food and Public Distribution released a guide 'Endorsements Know-hows!' for celebrities, influencers and virtual influencers on social media platforms.

### Why it matters?

- The guide aims to ensure that individuals do not mislead their audiences when endorsing products or services and that they are in compliance with the Consumer Protection Act and any associated rules or guidelines.
- With the increasing reach of digital platforms and social media, such as Facebook, Twitter and Instagram, there has been a rise in the influence of virtual influencers, in addition to celebrities and social media influencers.

- This has led to an increased risk of consumers being misled by advertisements and unfair trade practices by these individuals on social media platforms.

### Key Highlights:

- The "Endorsement Know-hows!" specify that disclosures must be prominently and clearly displayed in the endorsement, making them extremely hard to miss.
- Any celebrity, influencer or virtual influencer who has access to an audience and can influence their purchasing decisions or opinions about a product, service, brand, or experience must disclose any material connection with the advertiser.
- This includes not only benefits and incentives, but also monetary or other compensation, trips or hotel stays, media barter, coverage and awards, free products with or without conditions, discounts, gifts and any family or personal or employment relationship.
- Endorsements must be made in simple, clear language and terms such as "advertisement," "sponsored," or "paid promotion" can be used. They should not endorse any product or service in which due diligence has been done by them or that they have not personally used or experienced.

### Consumer Protection:

- The guide is released in alignment with the guidelines set by the Consumer Protection Act of 2019. The Act established guidelines for protecting consumers from unfair trade practices and misleading advertisements.
- The Department of Consumer Affairs has published Guidelines for prevention of Misleading Advertisements and Endorsements for Misleading Advertisements, 2022 on 9th June 2022.
- These guidelines outline the criteria for valid advertisements and the responsibilities of manufacturers, service providers, advertisers, and advertising agencies.
- These guidelines also touched upon the celebrities and endorsers. It states that misleading advertisement in any form, format or medium is prohibited by law.

### Way Forward:

- This will further strengthen the industry and protect consumer interests.

## UNION MINISTER DR JITENDRA SINGH SAYS, GOVERNANCE REFORMS INTRODUCED BY PRIME MINISTER NARENDRA MODI PROVIDE ENABLING ENVIRONMENT FOR WORKING WOMEN

### Why in news?

- Recently, the Union Minister of Personnel, Public Grievances & Pensions said that the Governance reforms introduced by Prime Minister Narendra Modi provide enabling environment for working women.



- Briefing about several measures undertaken by the Ministry of Personnel, DoPT has taken concerted efforts to increase the representation of women in Central Government jobs and to provide them a balance between professional as well as family life.

### Child Care Leave (CCL):

- In continuation of grant of 730 days Child Care Leave (CCL), some new measures have also been taken and those are like an employee on Child Care Leave may be permitted to leave headquarters with the prior approval of appropriate competent authority, the Leave Travel Concession (LTC) may be availed, while an employee is on CCL and can also proceed on foreign travel provided clearances from appropriate competent authorities are taken in advance.
- Moreover, minimum period for Child Care Leave reduced from mandatory 15 days to 5 days and the limit of 22 years in case of disabled child for the purpose of a government servant availing Child Care Leave under the provisions of Rule 43-C of the CCS (Leave) Rules, 1972 has been removed.
- Special Allowance @ Rs.3000/- p.m. to Women employees with Disability has been granted for child care with effect from 01st July, 2022, which will increase by 25% on increase of DA by 50%.
- Special Leave provision made connected to inquiry of sexual harassment, as leave up to a period of 90 days can be availed by an aggrieved female Government Servant, which will be granted during the pendency of the inquiry and the leave granted to the aggrieved female Government Servant under this rule shall not be debited against the leave account.

### Leave in case of emotional trauma:

- Keeping in view the potential emotional trauma caused due to stillbirth or death of a child soon after birth, which has a far-reaching impact on the mother's life, it has now been decided to grant a Special Maternity Leave of 60 days to a female Central Government Servant in case of death of a child soon after birth / stillbirth.

### Special provisions:

- Even during entire COVID period, special provisions for women officers and staffs made through various OMs like provision for attendance as per roster /

skeletal staff and Pregnant employees were exempted for roster and allowed to "Work from Home".

- As per a recent OM wherein a divorced daughter, in whose case a decree of divorce was issued after the death of her parents, will be eligible for family pension if the divorce petition was filed before death of the parents.
- Similarly, the families of missing employees covered under NPS can now get family pension within 6 months of lodging FIR and not wait for 7 years after which employee considered deemed dead.
- Even in cases where the Government servant dies before completing a service of 7 years, family pension shall be payable to the family at enhanced rate of 50% of last pay for first 10 years and thereafter @ 30% of last pay.

## 'CHARGESHEETS ARE NOT PUBLIC DOCUMENTS': BREAKING DOWN THE SC RULING



### Why in news?

- The Supreme Court, recently held that chargesheets are not 'public documents' and enabling their free public access violates the provisions of the Criminal Code of Procedure as it compromises the rights of the accused, victim, and the investigation agencies.
- Before dismissing the PIL seeking directions to the police or investigating agencies like the ED or the CBI, a two-judge bench of Justice MR Shah and Justice CT Ravikumar also cautioned against the possibility of 'misuse'.

### What is a chargesheet?

- A chargesheet, as defined under Section 173 CrPC, is the final report prepared by a police officer or investigative agencies after completing their investigation of a case.
- After preparing the chargesheet, the officer-in-charge of the police station forwards it to a Magistrate, who is empowered to take notice of the offences mentioned in it.
- The chargesheet should contain details of names, the nature of the information, and offences. Whether the accused is under arrest, in custody, or has been released, whether any action was taken against him,

- are all important questions that the chargesheet answers.
- Further, when the chargesheet relates to offences for which there is sufficient evidence against the accused, the officer forwards it to the Magistrate, complete with all documents. This forms the basis for the prosecution's case and the charges to be framed.
  - The charge-sheet is nothing but a final report of the police officer under s. 173(2) of the CrPC," the Supreme Court held in its 1991 ruling in K Veeraswami vs UOI & Ors.
  - A chargesheet must be filed against the accused within a prescribed period of 60-90 days, otherwise the arrest is illegal and the accused is entitled to bail.

### How is a chargesheet different from an FIR?

- The term 'chargesheet' has been expressly defined under Section 173 of the CrPC but 'First Information Report' or FIR, has not been defined in either the Indian Penal Code (IPC) or the CrPC. Instead, it finds a place under the police regulations/ rules under Section 154 of CrPC, which deals with 'Information in Cognizable Cases'.
- While the chargesheet is the final report filed towards the end of an investigation, an FIR is filed at the 'first instance' that the police is informed of a cognizable offense or offence for which one can be arrested without a warrant; such as rape, murder, kidnapping.
- Further, an FIR does not decide a person's guilt but a chargesheet is complete with evidence and is often used during the trial to prove the offenses the accused is charged with.
- After filing an FIR, the investigation takes place. Only if the police have sufficient evidence can the case be forwarded to the Magistrate, otherwise, the accused is released from custody under Section 169 of the CrPC. The law laid down by the Supreme Court in 1967 in Abhinandan Jha & Ors vs Dinesh Mishra reiterates this.
- Finally, the FIR should be filed at the first instance of receiving knowledge of the occurrence of a cognizable offense. According to Section 154 (3) of the CrPC, if any person is aggrieved by the refusal of authorities to file FIR, they can send the complaint to the Superintendent of Police, who will either investigate himself or direct it to their subordinate.

### Why is a chargesheet not a 'public document'?

- Dismissing the plea, the Court held that a chargesheet cannot be made publicly available as it's not a 'public document' under Sections 74 and 76 of the Evidence Act, as argued by the petitioners'.
- Section 74 of the Evidence Act defines 'public documents' as those which form the acts or records of sovereign authority, official bodies, tribunals, and of public offices either legislative, judicial or executive in any part of India, Commonwealth or a foreign

country. It also includes public records "kept in any State of private documents".

- Meanwhile, Section 76 of the Evidence Act mandates every public officer having custody over such documents to provide its copy pursuant to a demand and payment of legal fee, accompanied by a certificate of attestation along with the date, seal, name and designation of the officer.
- While dictating its order, the Court said that reliance on Sections 74 and 76 was 'misconceived' and added, "Documents mentioned in Section 74 of the Evidence Act can only be said to be public documents, certified copies of which are to be given by the concerned public authority having the custody of such a public document. Copy of chargesheets along with necessary public documents cannot be said to be 'public documents' under Section 74 of the Evidence Act."
- The Court also clarified that as per Section 75 of the Evidence Act, all documents other than those listed under Section 74' are private documents.

### 2016 & 2022 ruling of the Supreme Court:

- The Court rejected the petitioner's reliance on a 2016 ruling of the Supreme Court in 'Youth Bar Association of India vs UOI', where it directed all police stations in the country to publish copies of FIRs online within 24 hours of registration, except in cases where offenses were of sensitive nature.
- The Court rejected the reliance on its judgment by saying that the directions given by it in the 2016 ruling only applied to FIRs and could not extend to chargesheets.
- Meanwhile, Justice CT Ravikumar cited the 2022 ruling in 'Vijay Madanlal Choudhary vs UOI', where the Court held that ECIR is not equivalent to FIR and thus, the accused cannot be allowed a copy of the same.
- Applying the same principles to the present case, the Bench said that investigating agencies like ED could not be made to provide their chargesheets to the public.

## INTERNATIONAL RELATION

### INDIA AUSTRALIA ECONOMIC COOPERATION AND TRADE AGREEMENT: A WIN-WIN FOR INDIA AND AUSTRALIA

#### Why in news?

- India and Australia have entered into an Economic Cooperation and Trade Agreement.
- The ECTA was signed on 2nd April, 2022; after Ratification and Exchange of Written Instruments, the Agreement has come into force on 29th December 2022.



### A Win-Win for both India and Australia:

- It helps matters that Australia exports largely raw materials to India, while India exports finished goods. The ECTA builds on this complementarity, creating win-win opportunities for the two countries.

### Current trade trends between India and Australia:

- India's imports from Australia amount to 17 US \$ billion while its exports to Australia amount to 10.5 US \$ billion. However, India's imports from Australia are primarily (96%) raw materials & intermediate goods. They are highly concentrated in Coal (74% of Australia's exports to India) out of which 71.4% is coking coal.
- On the other hand, India's exports to Australia are broad-based and dominated by finished products (consumer goods). India also spends \$ 4 bn approx. each year on education of students in Australia.

### The IndAusECTA covers the following major areas:

- Trade in Goods
- Trade in Services
- Rules of Origin
- Technical Barriers to Trade (TBT) and Sanitary and Phytosanitary (SPS) measures
- Customs Procedures and Trade Facilitation
- Trade Remedies
- Legal & institutional Issues
- Movement of Natural Persons

### Benefits under Trade in Goods:

#### Indian goods on all tariff lines to get access to Australian market with zero customs duty

- The Agreement will benefit various labor-intensive Indian sectors that are currently subjected to 5% import duty by Australia.
- The agreement will result in immediate market access at zero duty to 98.3% of tariff lines accounting for 96.4% of India's exports to Australia in value terms.
- The remaining 1.7% lines are to be made zero duty lines over 5 years. Overall, Australia is offering duty elimination on 100% of its tariff lines.

#### Cheaper Raw Materials, Faster Approval for Medicines

- Immediate duty-free access covers all labour-intensive sectors such as Textiles and Apparel,

Agricultural and Fish products, Leather, Footwear, Furniture, many Engineering Products, Jewelry and select Pharmaceuticals.

- As a result, many industries such as steel, aluminium, garments and others will get cheaper raw materials which will enable them to become competitive.
- Both sides have also agreed to a separate Annex on Pharmaceutical products under this agreement, which will enable fast-track approval for patented, generic and biosimilar medicines.

### 90% of Australian exports by value to get zero duty access to Indian market

- India is offering zero duty access to 90% value of products from Australia (including coal). Zero duty on 85.3 % value of products will be offered immediately while zero duty on 3.67 % value of products will be offered progressively over 3, 5, 7 and 10 years.
- India has offered concessions on Tariff lines of export interest to Australia like Coking coal and Thermal coal, Wines, Agricultural products – 7 of them with TRQ (Cotton, Almonds shelled and in shell, Mandarin, Oranges, Lentils, Pear), Metals (Aluminium, Copper, Nickel, Iron & Steel) and Minerals (Manganese Ore, Calcined Alumina).
- Many sensitive products such as milk and other dairy products, wheat, sugar, iron ore, apple, walnuts and others, have been kept in India's Exclusion list.

### 10 Lakh More Jobs, 10 Billion Dollar More Exports in Five Years

- Immediate Duty-Free Access is projected to potentially create 10 lakh jobs in India and additional exports of \$ 10 bn from India to Australia in the next five years.

### Benefits under Trade in Services:

#### More than 1 lakh Indian students in Australia to benefit from post-study work visa

- The commitments made by Australia under Trade in Services are the best it has made in trade agreements till now and match its recent FTA with the UK.
- Australia has committed its schedule in the negative list and has also made wide-ranging commitments in around 135 sub sectors with Most Favoured Nation (MFN) status in around 120 sub-sectors.
- The Agreement provides for an Annual Quota of 1,800 for Yoga teachers and Indian Chefs. Post study work visa (18 months – 4 years) will be made available for Indian students. This will benefit more than 1,00,000 Indian students in Australia.

#### Australian services to get Negative List Treatment after 5 Years

- India has for the first time agreed to Negative listing after 5 years of coming into force of the Agreement.
- Under the negative listing approach, a country treats imported and locally produced goods / services equally in all areas, and areas where this is not done

are listed – in the negative list - as exceptions. So, in this case, India would provide this treatment to services exports from Australia, after a period of 5 years.

- India is also making a commitment to Australia in around 103 Service Sub-Sectors with Most Favoured Nation status in around 31 Service Sub-sectors for the first time. Australia gets commitments in banking, insurance, other financial services, business services.
- The Agreement opens avenues for investment in computer related services, telecom, construction, health & environmental services. All these are similar to past FTAs signed by India.
- Commitments have also been made to pursue Mutual Recognition Agreements (MRAs) in professional services in 12 Months.

### End to Double Taxation

- The Agreement has removed the discrepancies with regard to use of Double Taxation Avoidance Agreement for taxation of Indian firm royalties, fees and charges.
- Australia has no domestic provision for charging tax on royalties, fees and charges by firms sending these to parent companies.
- A provision in the Double Taxation Avoidance Agreement (DTAA) was used to tax this remittance. However, as an outcome of Ind - Aus ECTA, Australia has made changes in its tax laws, removing this discrepancy. This will eliminate Double taxation from 1st April 2023. As a result, the IT sector can earn higher profits and become competitive.

### Way Forward:

- The coming into force of the India Australia ECTA is expected to consolidate and help in the growth of market share of Indian products and services.
- New markets for Indian goods in Australia are also likely to emerge. There is an expected growth in pharmaceutical products with the easing of Australian regulatory processes.
- There is expected to be a vertical movement in value chains with the increasing presence of higher value products of advanced technology.
- Exports are expected to increase by 10 billion by 2026-27 with a creation of approximately 10 lakh jobs. The total bilateral trade is expected to cross US \$ 45-50 billion by 2035.
- It is expected that there will be enhanced job opportunities for Indians in Australia and increased remittance and investment flows to India from Australia.

## JAPAN, INDIA HOLD THEIR FIRST JOINT AIR DRILL AS CHINA CONCERNS GROW

### Why in news?

- Japan and India held their first joint air drills as

both countries step up military exercises with other countries amid worries about China's assertiveness.

- About four F-2 and four F-15 fighters are expected to take part in the drills and will run through around Jan. 26 at an airbase in Ibaraki prefecture, northeast of Tokyo. While the two have trained together before in other countries, this is the first one-on-one training of its sort.



### Key Highlights:

- India is fielding Russian-made fighters, Su-30Mki and US-made C-17 Globemaster heavy lift transport aircraft in the maiden exercise.
- The two sides will carry out air complex combat drills and exchange best practices reflecting their growing defense cooperation.

### Background:

- The exercise comes as Japanese Prime Minister completed a trip to Italy, the UK, Canada and the US to bolster his country's alliances to help deter China.
- Japan is also a member of the Quad grouping that includes India, Australia and the US and is seen as a check on Beijing's assertiveness in the Indo-Pacific.
- The joint drills with India grew out of a security meeting in New Delhi in November 2019 but had been put on hold due to the coronavirus pandemic.
- India is the fifth country Japan has hosted in this type of bilateral exercise after the US, Australia, Britain and Germany.

### India-China:

- Tensions between India and China have been simmering along a disputed border between the two since a June 2020 clash, the worst in more than 40 years.
- That fighting was centered around the Himalayan region of Ladakh, along their 3,488-kilometer (2,170-mile) frontier known as the Line of Actual Control.

## ECONOMY

## HOW WILL THE FREE FOOD GRAIN SCHEME WORK OUT?

### Why in news?

- In a recent Cabinet decision, the Centre decided to

provide 5 kg of free foodgrains per month for the 81 crore beneficiaries of the National Food Security Act (NFSA) during 2023, rather than charging them a subsidised amount of ₹3 a kg of rice, ₹2 a kg of wheat and ₹1 a kg of coarse cereal as is currently done.



- This will soften the blow of the termination of the Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY), which has provided an additional 5 kg of free grains every month to NFSA beneficiaries after being launched as an emergency measure in response to the COVID-19 pandemic in April 2020 and received multiple extensions since.

### What is the impact of this measure on the food subsidy bill?

- In a normal year, without COVID disruptions, the Centre's food subsidy bill on account of the NFSA amounted to around ₹2 lakh crore.
- The PMGKAY effectively doubled that sum for the past two years. Now that the Centre plans to give free foodgrains under the NFSA for a year, it will spend an additional ₹15,000 crore to ₹16,000 crore on that.
- However, the Centre will save around ₹2 lakh crore by ending the PMGKAY scheme. Overall, the move will relieve a major burden on the Union Budget.

### What does this mean for foodgrain stocks?

- Experts point out that the move will be even more of a relief for stressed foodgrain stocks. The annual foodgrain requirement for the NFSA is about 520 lakh tonnes, while the PMGKAY required an additional 480 lakh tonnes.
- The difference comes from the fact that the poorest families coming under the Antyodaya Anna Yojana category received 35 kg a family every month under the NFSA, but received 5 kg per person under the PMGKAY. At the time when the PMGKAY was launched, foodgrain production, government procurement and government stocks were regularly breaching record levels.

### Low Harvest in 2022:

- In 2022, however, the situation is different. Rice and wheat harvests have both been lower this year, hit by climatic events and fertilizer shortages in some areas. The global stress due to the Russia-Ukraine war has also led to a situation of high foodgrain inflation.

- India's wheat stocks in particular, have dipped dangerously close to the required buffer stock levels, with the Centre resorting to a ban on exports to ensure food security for the domestic market.
- It has also been forced to substantially reduce wheat allocations under the Public Distribution System, and substitute wheat supply with rice in States such as Uttar Pradesh and Bihar. Continuing the PMGKAY would have been unsustainable without further increasing procurement levels.

### How will it impact beneficiaries?

- Leaving aside government budgets, household budgets could be upended by the move. The Right to Food Campaign estimates that poor families will be forced to spend ₹750-₹900 a month to access the current level of ration entitlement.
- Ration card holders who have received 10 kg of grains a person every month for the past two years will see their entitlement abruptly halved. Of course, their expenditure on their NFSA entitlement will also come down, for instance, someone spending ₹8 for four kg of wheat and ₹3 for a kg of rice under NFSA will now get those grains free, saving ₹11 a month.
- However, that is dwarfed by the additional ₹150-₹175 they will need to spend to buy the 5 kg previously provided free under the PMGKAY in the open market (estimating market prices for rice and wheat at around ₹30-₹35 per kg).
- The increased expenditure will be even starker for those in States which anyway provide free NFSA rations, since beneficiaries in those States will not even receive any savings due to the Centre's announcement.
- However, the consumption of foodgrains as part of a meal varies substantially by State, ranging from about 200 gm per person a day in Kerala to 400 gm in Bihar, and the impact of the move is thus likely to be the highest in the Hindi heartland States where grains make up a higher proportion of the diet.

## INTERNATIONAL YEAR OF MILLETS (IYM) 2023



### Context:

- Spearheaded by the Prime Minister, the Government of India sponsored the proposal for International Year

- of Millets (IYM) 2023 which was accepted by the United Nations General Assembly (UNGA).
- The declaration has been instrumental for the Government of India to be at the forefront in celebrating the IYM.

### Millets:

- 'Millets' were among the first crops to be domesticated in India with several evidence of its consumption during the Indus valley civilization.
- Being grown in more than 130 countries at present, Millets are considered traditional food for more than half a billion people across Asia and Africa.
- In India, millets are primarily a kharif crop, requiring less water and agricultural inputs than other similar staples.

### Related activities:

- Recognising the enormous potential of Millets, which also aligns with several UN Sustainable Development Goals (SDGs), the Government of India (GoI) has prioritized Millets.
- In April 2018, Millets were rebranded as "Nutri Cereals", followed by the year 2018 being declared as the National Year of Millets, aiming at larger promotion and demand generation.
- The global millets market is projected to register a CAGR of 4.5% during the forecast period between 2021-2026.
- On 6th December 2022, the Food and Agriculture Organization (FAO) of the United Nations, organized an opening ceremony for the International Year of Millets – 2023 at Rome, Italy.
- Next in the series, the Department of Agriculture & Farmers Welfare hosted a special 'Millet Luncheon' for the Members of the Parliament at the Parliament house.

### Collaborative approach:

- The Department of Agriculture & Farmers Welfare has taken a proactive multi-stakeholder engagement approach (engaging all the central government ministries, states/UTs, farmers, start-ups, exporters, retail businesses, hotels, Indian Embassies etc.) to achieve the aim of IYM 2023 and taking Indian millets globally.
- Ministries, states and Indian embassies have been allocated focussed months in 2023 to carry out various activities for promotion of IYM and increase awareness about benefits of millets for the Consumer, Cultivator and Climate.
- Towards this endeavour, through a collaborative approach, the DA&FW urges everyone including the International Organizations, Academia, Hotels, Media, Indian Diaspora, Start-up communities, Civil Society, and all others in the Millets value-chain to come forward and join hands to revive the forgotten glory of 'Miracle Millets' through the grand celebration of International Year of Millets - 2023.

- Millets are also an integral part of the G-20 meetings and delegates will be given a true millet experience through tasting, meeting farmers and interactive sessions with start-ups and FPOs.

## WORLD'S LONGEST RIVER CRUISE 'GANGA VILAS' TO UNLOCK RIVER CRUISE TOURISM IN INDIA



### Why in news?

- The launch of world's longest river cruise with MV Ganga Vilas by the Prime Minister on 13 January, 2023 in Varanasi will herald a new age of river cruise tourism for India.
- The luxury cruise will cover a distance of more than 3,200 kms across 27 river systems in 5 states in India and Bangladesh.

### Key Highlights:

- The MV Ganga Vilas cruise is curated to bring out the best of the country to be showcased to the world. The 51 days cruise is planned with visits to 50 tourist spots including World Heritage Sights, National Parks, river Ghats, and major cities like Patna in Bihar, Sahibganj in Jharkhand, Kolkata in West Bengal, Dhaka in Bangladesh and Guwahati in Assam.
- The MV Ganga Vilas vessel is 62 meters in length, 12 meters in width and comfortably sails with a draft of 1.4 meters.
- It has three decks, 18 suites on board with a capacity of 36 tourists, with all the amenities to provide a memorable and luxurious experience for the tourists.
- The ship follows sustainable principles at its core as it is equipped with pollution-free mechanisms and noise control technologies.
- The maiden voyage of MV Ganga Vilas will witness 32 tourists from Switzerland relishing the Varanasi to Dibrugarh journey. The expected date of arrival of MV Ganga Vilas in Dibrugarh is on 1st March, 2023.

### Itinerary of MV Ganga Vilas:

- From the famous "Ganga Arti" in Varanasi, it will stop at Sarnath, a place of great reverence for Buddhism. It will also cover Mayong, known for its Tantric craft, and Majuli, the largest river island and hub of Vaishnavite cultural in Assam.

- The travellers will also visit the Bihar School of Yoga and Vikramshila University, allowing them to soak in the rich Indian heritage in spirituality and knowledge.
- The cruise will also traverse through the biodiversity rich World Heritage Sites of Sunderbans in Bay of Bengal delta, famous for Royal Bengal Tigers, as well as Kaziranga National Park, famous for one horn rhino.

### Global River cruise market:

- The global River cruise market has grown at ~5% over the last few years and is expected to constitute ~37% of cruise market by 2027. Europe has been driving growth with approx. 60% share of river cruise vessels in the world.
- In India, 8 river cruise vessels are operational between Kolkata and Varanasi while cruise movement is also operation on National Waterways 2 (Brahmaputra). Tourism activities like river rafting, camping, sightseeing, kayaking and so on are operation in many spots in the country.
- The construction of 10 passengers terminals across NW2 are going on which will further bolster the prospect of river cruise. At present, four river cruise vessels are operational in NW2 while it is operating in limited capacity in NW3 (West Coast Canal), NW8, NW 4, NW 87, NW 97, and NW 5.
- As the capital expenditure is pumped to build capacity in the inland waterways, the river cruise is set to grow further with systematic forward and backward linkage for the economy, especially across the banks of the rivers.

### Way Forward:

- With support from the Inland Waterways Authority of India (IWAI) under Ministry of Shipping, Ports and Waterways (MoPSW), the success of MV Ganga Vilas cruise service is likely to enthuse entrepreneurs to explore river cruise in other parts of the country.

## 13TH MINISTERIAL-LEVEL MEETING OF THE INDIA-UNITED STATES TRADE POLICY FORUM (TPF)



### Why in news?

- India and the United States held the 13th Ministerial-

level meeting of India – United States Trade Policy Forum (TPF) in Washington, DC recently.

- Indian Minister of Commerce and Industry Piyush Goyal and the U.S. Trade Representative Ambassador Katherine Tai co-chaired the meeting.

### Highlights of the 13th India – USA TPF 2023 discussions are as follows:

- They appreciated that bilateral trade in goods and services continued to rise rapidly and reached about \$160 billion in 2021 while recognizing that significant potential remains unfulfilled and expressed their mutual desire to further enhance engagement with the goal of continuing to increase and diversify bilateral trade.
- India appreciated the resumption of inspections by U.S. Food and Drug Administration (FDA) and asked the U.S. side to also resume inspections of new facilities and non-priority areas at the earliest.
- They welcomed the finalization of the Turtle Excluder Device (TED) design. The collaboration between India and the United States to expedite the TED trials will ensure that the TEDs are effective in minimizing the impact of fishing on sea-turtle populations and restore the market access for India's export of wild caught shrimp.
- India highlighted its interest in restoration of its beneficiary status under the U.S. Generalized System of Preferences program. The United States noted that this could be considered, as warranted, in relation to the eligibility criteria determined by the U.S. Congress.
- They acknowledged the constructive engagement of the Services Working Group under the Trade Policy Forum and noted that the movement of professional and skilled workers, students, investors and business travelers between the countries contributes immensely to enhancing bilateral economic and technological partnership.
- They acknowledged the ongoing discussions on a Social Security totalization agreement and supported intensifying the work to achieve early outcomes in the matter.
- They encouraged their regulatory bodies to engage in discussions on exchanges of knowledge, capacity building, and recognition of qualifications to further enhance trade in professional services. The Ministers also noted that greater co-operation in the Fintech sector. They also discussed the potential of digital health, particularly telemedicine services as an element in continuity of care during the health emergencies.

### Creation of a new TPF Working Group on Resilient Trade:

- Reflecting their shared objective of deepening and broadening the U.S.-India trade relationship, they launched a new TPF Working Group on Resilient Trade.

⇒ This new Working Group will enable officials to deepen bilateral dialogue on a range of issues that can enhance the resiliency and sustainability of the trade relationship so that it is better able to withstand current and future global challenges.

**At the 2024 TPF Ministerial meeting, the Resilient Trade Working Group will initially focus on the following areas:**

- Deepening engagement on trade facilitation, which is particularly relevant to the construction of durable and sustainable supply chains. They welcomed plans for a dedicated working session on trade facilitation in the coming months, including on digitization of customs procedures, and that officials will also identify additional areas for future cooperation;
- The importance of benefitting workers and promoting sustainable and inclusive growth, including cooperative engagement to promote labor rights and workforce development;
- Expanded dialogue on good regulatory practices and pursuing cooperation in areas of mutual interest with an initial focus on respective procedures for developing rules and regulations in advance of the next TPF Ministerial meeting;
- The role that trade can play in contributing to environmental protection and responses to common sustainability challenges including issues related to mobilization of sustainable finance and scaling up of innovative clean technologies. Further, both sides may also engage on issues of mutual interest related to circular economy approaches and promotion of sustainable lifestyle choices;
- Additional means of strengthening the resilience in our global supply chains, especially in the critical sectors that underpin our economies, as well as further work on these issues in coordination and cooperation with our trusted partners.

#### Way Forward:

- ⇒ They concluded by directing the TPF Working Groups to reconvene quarterly, either in person or virtually, and identify specific trade outcomes to ensure that trade relationship begins to reach its full potential.
- ⇒ They will hold an inter-sessional TPF meeting by mid-2023 and agreed to reconvene the TPF at the Ministerial level before the end of 2023.

### FIRST TIME IN INDIA, FSSAI NOTIFIES COMPREHENSIVE REGULATORY STANDARDS FOR BASMATI RICE

#### Why in news?

- ⇒ For the first time in India, Food Safety and Standards Authority of India (FSSAI) has specified the identity standards for Basmati Rice (including Brown Basmati Rice, Milled Basmati Rice, Parboiled Brown Basmati Rice and Milled Parboiled Basmati Rice) vide Food

Safety and Standards (Food Products Standards and Food Additives) First Amendment Regulations, 2023.



#### Standards:

- ⇒ As per these standards, Basmati rice shall possess natural fragrance characteristic of basmati rice and be free from artificial colouring, polishing agents and artificial fragrances.
- ⇒ These standards also specify various identity and quality parameters for basmati rice such as average size of grains and their elongation ratio after cooking; maximum limits of moisture, amylose content, uric acid, defective/damaged grains and incidental presence of other non-basmati rice etc.

#### About Basmati rice:

- ⇒ Basmati rice is a premium variety of rice cultivated in the Himalayan foothills of the Indian sub-continent and is universally known for its long grain size, fluffy texture and unique inherent aroma and flavour.
- ⇒ Agro-climatic conditions of the specific geographical areas where Basmati rice is grown; as well as the method of harvesting, processing and ageing of the rice contributes to the uniqueness of Basmati rice.
- ⇒ Due to its unique quality attributes, Basmati is a widely consumed variety of rice both domestically and globally and India accounts for two thirds of its global supply.

#### Way Forward:

- ⇒ Being a premium quality rice and fetching a price higher than the non-basmati varieties, Basmati rice is prone to various types of adulteration for economic gains which may include, among others, undeclared blending of other non-basmati varieties of rice.
- ⇒ The standards are aimed at establishing fair practices in the trade of Basmati rice and protect consumer interest, both domestically and globally. These standards will be enforced w.e.f 1st August, 2023.

### RICHEST 1% OF INDIANS NOW OWN 13 TIMES MORE WEALTH THAN BOTTOM HALF: OXFAM

#### Why in news?

- ⇒ Recently, Oxfam India released a report titled, "Survival of the Richest: The India Supplement".
- ⇒ More than half of the wealth of the top 10 per cent of richest Indians is owned by the top 1 per cent.



### Key Highlights:

- The richest one per cent of Indians own over 13 times more wealth than the bottom 50 per cent, according to a report by Oxfam India.
- The top five per cent own 61.7 per cent of the total wealth, nearly 20 times more than the 3 per cent owned by the bottom half.
- The share of the top 10 per cent in India's total wealth has risen from 45 per cent to 63 per cent between 1981 and 2012. On the other hand, the wealth of the bottom half halved during the same period.

### Burden of the tax:

- The burden of the tax falls invariably high on the poor. The bottom 50 per cent income group spends a higher percentage of their income on indirect taxes than the middle 40 per cent and the top 10 per cent combined.
- The top 10 per cent spend the least percentage of their income on taxes among the three groups. Sixty-four per cent of all Goods and Services Tax (GST) collections come from the bottom 50 per cent and 4 per cent from the top 10 per cent.
- The bottom 50 per cent of the population pays six times more on indirect taxation than the top 10 per cent.

### Inequality:

- Inequality has become worse since the onset of the Covid-19 pandemic.
- The top 5 per cent have continued to see their prosperity rise to owning around three-fifth of the total wealth in India (nearly 62 per cent), which is higher than the pre-pandemic years.
- While the country suffers from multiple crises like hunger, unemployment, inflation and health calamities, India's billionaires are doing extremely well for themselves. The poor meanwhile in India are unable to afford even basic necessities to survive.
- The number of hungry Indians increased to 350 million in 2022 from 190 million in 2018.

### Way forward:

- Taxing the super-rich is the strategic precondition to reducing inequality and resuscitating democracy.
- It suggested a reduction in the GST slabs on essential commodities. The rates can be hiked for luxury

goods. It also suggested raising taxes on capital gains, which are subject to lower tax rates than other forms of income.

- Additionally, the wealth of the top 1 per cent should be taxed on a "permanent basis" with higher rates for millionaires, multi-millionaires and billionaires.
- The Centre should ensure workers in the formal and informal sectors are paid basic minimum wages. The minimum wages should be at par with living wages which is essential to live a life with dignity.

### INDIA-CHINA TRADE DEFICIT CROSSES OVER \$100 BILLION FOR THE FIRST TIME



### Why in news?

- India's trade deficit with China crossed for the first time a USD 100 billion mark.
- The trade deficit for India stood at USD 101.02 billion, surpassing the 2021 figure of US 69.38 billion.

### Details:

- India's total exports to China in 2022 was USD 17.48 billion, a year-on-year decline of 37.9 per cent. In 2021, India's export stood at USD 28.1 billion.
- Meanwhile, there has India's import from China in 2022 climbed to \$118.5 billion, a year-on-year increase of 21 per cent from \$97.5 billion in 2021.

### India-China trade touches all-time high:

- The trade between India and China touched record high of USD 135.98 billion in 2022, overtaking the USD 125.6 billion mark in 2021.
- There has been an 8.4 per cent increase in trade between India and China in 2022.
- In 2021, India's trade with China witnessed an increase of 43.32 per cent year-on-year, crossing USD 100 billion mark for the first time.
- The trade deficit in 2021, meanwhile, stood at USD 69.56 billion as India's imports from China saw an increase of 46.14 per cent to reach USD 97.59 billion.
- Also, in 2021, India's export to China increased by 34.28 per cent year-on-year to reach USD 28.03 billion.

### Rapid expansion:

- Trade between India and China continued to increase despite border tensions following the military standoff in eastern Ladakh in May 2020.

- ⇒ The rapid expansion of India-China bilateral trade since the beginning of this century has propelled China to emerge as India's largest goods trading partner by 2008.
- ⇒ Since the beginning of the last decade, bilateral trade between India and China recorded exponential growth. India-China bilateral trade grew by 75.30 per cent, an average yearly growth of 12.55 per cent.

#### China's trade statistics:

- ⇒ China's trade surplus swelled to a record \$877.6 billion in 2022 as exports rose despite weakening US and European demand and anti-virus controls that temporarily shut down Shanghai and other industrial centers.
- ⇒ Exports increased 7 per cent from a year earlier to \$3.95 trillion, decelerating from 2021's explosive 29.9 per cent gain.
- ⇒ Imports edged up 1.1 per cent to 2.7 trillion, cooling from the previous year's 30.1 per cent rise as economic growth slowed and consumer spending weakened.

### WHY HAS RBI WARNED STATES AGAINST OLD PENSION SCHEME?



#### Why in news?

- ⇒ The Reserve Bank of India (RBI) has cautioned states against reverting to the old pension scheme (OPS), which was in vogue till 2004, stating that it will add to the fiscal burden of States in the coming years.
- ⇒ RBI says OPS, instead of the National Pension Scheme (NPS) will lead to the accumulation of liabilities which can become a major risk in the future.

#### What did RBI say about the old pension scheme?

- ⇒ A significant risk looming large on the subnational fiscal horizon is the likely reversion to the old pension scheme by some states.
- ⇒ As per the Budget estimates for 2022-23, states are expected to incur a 16 per cent rise in pension expenditure at Rs 463,436 crore in 2022-23 as against Rs 399,813 crore in the previous year, the RBI said.
- ⇒ The compounded annual growth rate (CAGR) in pension liabilities for the 12 years ended FY22 was 34 per cent for all the state governments.

#### Why are more states going for OPS?

- ⇒ The RBI warning has come after more states joined the queue to bring back OPS instead of the National Pension Scheme (NPS). After Rajasthan, Chhattisgarh, Jharkhand and Punjab, Himachal Pradesh has announced its intention to opt for OPS. States have found it convenient to pay old pensioners with the money collected from the serving employees.
- ⇒ Under the OPS, retired employees received 50 per cent of their last drawn salary as monthly pensions. OPS is considered fiscally unsustainable, and state governments do not have the money to fund it. OPS had no accumulated funds or stock of savings for pension obligations and hence was a clear fiscal burden.
- ⇒ Interestingly, the scheme is always an attractive dispensation for political parties as the current aged people can benefit from it even though they may not have contributed to the pension kitty.

#### Old pension scheme vs NPS:

- ⇒ An old pension scheme (OPS), commonly known as the PAYG scheme, is defined as an unfunded pension scheme where current revenues fund pension benefits.
- ⇒ Under this scheme, the contribution of the current generation of workers was explicitly used to pay the pensions of existing pensioners.
- ⇒ OPS involved a direct transfer of resources from the current generation of taxpayers to fund the pensioners. While the PAYG scheme was in vogue in most countries before the 1990s, it was discontinued given the problem of pension debt sustainability, an ageing population, an explicit burden on future generations and the incentive for early retirement (as the pension is fixed at the last drawn salary).

#### NPS:

- ⇒ NPS is a defined contribution pension scheme. NPS enables an individual to undertake retirement planning while in employment. With systematic savings and investments,
- ⇒ NPS facilitates the accumulation of a pension corpus during their working life. NPS is designed to deliver a sustainable solution of having adequate retirement income in old age or upon superannuation.
- ⇒ NPS is mandatory for central government employees joining services on or after January 1, 2004, and almost all state governments have adopted it for their employees.
- ⇒ NPS, regulated by the Pension Fund Regulatory and Development Authority (PFRDA), is a contributory pension scheme under which employees contribute 10 per cent of their salary (Basic + Dearness Allowance).
- ⇒ The government contributes 14 per cent towards the employees' NPS accounts.

**INDIA REITERATES ITS POSITION AS A RESILIENT ECONOMY WITH A STRONG LEADERSHIP PROVIDING STABLE POLICY TO THE GLOBAL INVESTORS AT THE WORLD ECONOMIC FORUM (WEF)**



**Why in news?**

- In line with WEF theme 2023, "Cooperation in a Fragmented World", India has reiterated its position as a resilient economy with a strong leadership providing stable policy to the global investors at the World Economic Forum (WEF) at Davos.

**Details:**

- India's focus areas at WEF in 2023 are investment opportunities, infrastructural landscape and its inclusive & sustainable growth story.
- Taking forward the strategy and presence of India during WEF Annual Meeting in May 2022, the Department for Promotion of Industry and Internal Trade (DPIIT) has taken the initiative to further strengthen India's presence through three lounges with focus on investment opportunity, sustainability and inclusive approach to compliment economic growth.

**India Lounge at Promenade 68**

- The India lounge is the focal point of all business engagements taking place on the side-lines of the World Economic Forum Annual Meeting 2023.
- In line with the Government of India's priorities, the India Lounge has organized sessions, roundtables & fireside chats on India's growth wave, energy transition, the transforming infrastructure landscape, rising digitalization, fintech, healthcare, electronic & semiconductor supply chain & startup ecosystem.
- There is a digital showcase of key manufacturing sectors, Startups, India's G20 presidency and India's focus on infrastructure. Complementing this, the lounge has curated authentic Indian One District One Product (ODOP) souvenirs along with Indian food showcasing India's heritage and culture.

**India Inclusivity Lounge at Promenade 63:**

- The Inclusivity lounge at Promenade 63 at World Economic Forum redefines the Davos narrative

with the vision of the Prime Minister of India, Shri Narendra Modi for inclusivity. Traditionally only select few big businesses were present at Davos.

- In 2023, India at Davos has a special lounge that represents the voice of the smaller enterprises, individual artisans, women self-help groups, specially abled etc. The lounge showcases hand-made products that represent years of rich Indian heritage and cultural history and generations of craftsmanship.
- The products represent all States and Union Territories of India, ranging from coconut cutlery from Andaman to Khurja pottery from Uttar Pradesh. They span across all sectors from textiles to handicrafts to social empowerment.

**India Sustainability Lounge at Promenade 49:**

- Through this lounge, India showcases new and emerging technologies that are set to address the climate change issues faced round the world.
- It also shows leadership in combating climate change and meeting the Sustainable Developmental Goals (SDGs), as is reflected in many of its developmental schemes. India would be showcasing these technologies through five broad themes which are mentioned below:
  - a) Energy Sector
  - b) Natural Resource Management
  - c) Sustainable infrastructure and Mobility
  - d) Food and Nutritional Security
  - e) Circular Economy

**India's journey to Net Zero:**

- Along with this the lounge is enabling collaboration and cooperation with businesses and industry bodies from across the world to be part of India's journey to Net Zero.
- The lounge showcases automated manual scavenging robot along with 12 startup prototypes. Interactive screen with a carbon calculator along with information on the innovation world in the realm of sustainability are also showcased at the lounge.

**FOURTH INDUSTRIAL REVOLUTION:  
'4IR CRITICAL FOR INDIA'**

**Why in news?**

- The Centre for the Fourth Industrial Revolution in India (C4IR) was established in October 2018 to focus on the role of emerging technologies across different sectors and to plug the challenges that will emanate.

**Three pillars:**

- a) The first is the 4IR technologies such as artificial intelligence, the internet of things, blockchain and others.
- b) The second focus is on public-private cooperation. India recently announced drone services, an area where it with the Centre and several state governments.

c) The third pillar is a multi-stakeholder partnership. The role of technology in various sectors, include government, industries, start-ups, civil society, and consumers for inclusiveness. The overall focus is to bring in greater social good by leveraging technologies.



**Colorations:**

- It have signed a memorandum of understanding (MoU) with the Telangana and Karnataka governments.
- It have a taskforce working with the Meghalaya government, and talks are underway with the Arunachal Pradesh government.
- It is also working with Maharashtra and Tamil Nadu on specific sectors, including agriculture.

**Significance:**

- The role of technology is going to be significant in a country like India, which is resource crunched. The country is fast adopting 4IR technologies, compared to many developed countries.
- The Centre has developed a data ecosystem through a platform approach such as UPI (Unified Payments Interface) and Aadhaar. There are upcoming platforms as well, such as the one on logistics announced in the budget.
- India is well placed because of its position in the services sector. Within the skills part, India has a substantial young population and an education system capable of producing the required skill sets.

**Way Forward:**

- There is also the intent to make it really big in terms of scale. It is working closely to address the concerns around safety, security and biases.
- It is one-of-a-kind facility which is developing ways to make technologies in various industries more ethical and responsible.

**EXIM DATA REVISED, TRADE DEFICIT NARROWS BY \$10 BN**

**Why in news?**

- India's foreign trade data for the first eight months of 2022-23 have been significantly revised, with the import bill being scaled up or down by at least two billion dollars in each of those months, in comparison

to the preliminary estimates issued by the Union Commerce Ministry.

**Revised trade figures**

The table shows India's revised trade balance data from April to November 2022

Months	Trade balance	Initial estimate	Revision
April	-18,360	-20,110	1,750
May	-22,125	-24,290	2,165
June	-22,210	-26,180	3,970
July	-25,607	-30,000	4,393
August	-26,848	-27,980	1,132
September	-29,236	-25,710	-3,526
October	-27,416	-26,910	-506
November	-23,372	-23,890	518
April - Nov.	-195,174	-205,070	9,896

All figures in \$ million Source: CEIC, Commerce and Industry Ministry

**Details:**

- The total merchandise exports between April and November are now pegged at \$298.3 billion, nearly \$12 billion higher than what the original monthly data suggested. The import bill in those eight months is now estimated at \$493.5 billion, about \$1.7 billion higher than the initial numbers.
- The trade deficit in the first eight months of the year is \$10 billion lower than indicated by adding up monthly preliminary estimates.

**Revised Exim data:**

- September now marks the worst monthly trade deficit of \$29.23 billion for India. As per earlier data, July 2022 was reckoned to have the worst goods trade deficit on record of \$30 billion, but its import bill has been subsequently scaled down sharply from \$66.3 billion to a little short of \$64 billion, while exports have been raised by \$2.1 billion.
- Consequently, July's deficit is now pegged at just \$25.6 billion, which was, in fact, lower than the deficit recorded over the next three months.
- October and August 2022 recorded the second and third highest monthly deficits in merchandise trade at \$27.4 billion and \$26.8 billion, with the import bill for these months being revised up by \$2.3 billion and almost \$2 billion, respectively.
- The steepest revision in export numbers has been made for August and November at \$3.1 billion and \$2.8 billion, respectively. As per preliminary estimates, exports in November had grown just 0.6% to \$31.99 billion, but revised numbers signal a 9.6% year-on-year rise, with shipments worth \$34.85 billion.

**Issues:**

- Economists said such wide variations in data are unusual and make it difficult to formulate policies, especially when a critical focus area for the economy is managing the current account deficit, fuelled by rising imports and a feared slowdown in exports amid a global recession.
- The import figure for September 2022 has seen the sharpest revision, from an earlier estimate of just \$61.1 billion to the year's highest tally at \$64.7 billion.

⇒ In a report on November's foreign trade data, rating firm ICRA also flagged the "large discrepancy between the monthly data on merchandise exports and the cumulative data for the same that accounts for revisions, both of which are released by the Ministry of Commerce and Industry".

### Widening gap:

- ⇒ By November, the gap between preliminary export estimates for each month and the cumulative figure for the full year so far, stood at \$8.6 billion. This gap has now stretched to \$11.6 billion after November's exports were also revised higher.
- ⇒ The Reserve Bank of India (RBI) has alluded to the corrections in trade numbers, while referring to the merchandise trade deficit reaching an all-time high of \$83.5 billion and the current account deficit (CAD) rising to 4.4% of the GDP in the second quarter (Q2) of 2022-23.
- ⇒ Incidentally, revised goods trade estimates for July to September included in the same bulletin peg the deficit for the second quarter lower at \$81.69 billion.
- ⇒ In its December bulletin RBI said that the net exports' contribution to aggregate demand in Q2 was negative as imports grew faster. Subsequent data revisions put November's imports at 58.2 billion, which was the lowest in seven months.

## SC PANEL QUESTIONS NEED TO REVIVE OIL PALM PLANTATIONS IN ANDAMANS



### Why in news?

⇒ Oil palm plantations raised in the Andaman and Nicobar Islands in the past have proven to be a total commercial failure, the Supreme Court-constituted Central Empowered Committee (CEC) has said, questioning the need to revive the commercial crop in the archipelago.

### What was the issue before SC?

- ⇒ The Union Territory administration, in January 2019, moved the Supreme Court seeking revocation of its 2002 ban on commercial and monoculture plantations on forest land in the Andaman and Nicobar Islands.
- ⇒ The proposal is part of the government's efforts to meet the vegetable oil shortage in the country and reduce its import burden.

⇒ The SC had asked the CEC to provide inputs on the Union Territory administration's proposal to lift the ban and divert 16,000 hectares of forest land for red oil palm plantations.

### Key Highlights:

- ⇒ The committee said any permission for diversion of forest land for red oil palm plantation in the archipelago in violation of the Forest Conservation Act, 1980, "is bound to open flood gates in all the states for similar agricultural purposes on forest lands".
- ⇒ The CEC also said oil palm plantation might lead to encroachment of forest lands in the islands group and asked why the production of palm oil could not be taken up on the mainland.
- ⇒ Since the focus of the proposal is on meeting the shortage of vegetable oil in the country, why cannot the production of palm oil be taken up on the mainland, where the oil palm plantations have been successfully raised.
- ⇒ The application merely states that grasslands will be utilised for this purpose "without any specific reference to the existence of grasslands in Andaman and Nicobar Islands and location of such grasslands".

### Illegal migration:

- ⇒ The 16,000 hectares of forest land where the palm oil plantations are proposed to be raised has not been identified and demarcated.
- ⇒ The committee also said the raising and maintenance of 16,000 hectares of commercial plantations will require engagement of 32,000 plantation labourers on a continuous basis at a very conservative estimate.
- ⇒ It said the availability of such a large labour force in the islands is doubtful and the possibility of illegal migrants entering from neighbouring countries cannot be ruled out.

### National Mission on Edible Oils-Oil Palm (NMEO-OP):

- ⇒ In 2021, the Centre launched the Rs 11,040-crore National Mission on Edible Oils-Oil Palm (NMEO-OP) with focus on oil palm plantations in the northeast and the Andaman and Nicobar Islands due to their favourable climate for the purpose.
- ⇒ India depends on imports to meet its requirements for edible oil and is its largest importer in the world.
- ⇒ During 2020-21, India imported around 133.52 lakh tonnes of edible oils, costing around Rs 80,000 crore, the Centre said in its operational guidelines, prepared last year, for NMEO-OP.
- ⇒ Of all the imported edible oils, the share of palm oil is about 56 per cent, followed by soybean oil (27 per cent) and sunflower oil (16 per cent).
- ⇒ Domestic edible oil production has not been able to keep pace with the growth in consumption, which is above 250 lakh tonnes.

**Way Forward:**

- Citing damage done to rainforests and biodiversity by oil palm plantations in Southeast Asia, environmental experts have warned that their cultivation in the Andaman and Nicobar Islands could be disastrous.

### SOVEREIGN GREEN BONDS: WHAT DO THEY MEAN FOR INVESTORS, AND THE ENVIRONMENT?

**Why in news?**

- Recently, the Reserve Bank of India (RBI) auctioned maiden sovereign green bonds (SGrBs) worth Rs 8,000 crore.
- This is part of the Rs. 16,000 crore Sovereign Green Bond auction that the RBI will conduct in the current financial year.

**What are Green Bonds?**

- Green bonds are bonds issued by any sovereign entity, inter-governmental groups or alliances and corporates with the aim that the proceeds of the bonds are utilised for projects classified as environmentally sustainable.
- The framework for the sovereign green bond was issued by the government on November 9, 2022.
- The RBI is auctioning two green bonds with tenures of 5 and 10 years, worth Rs 4,000 crore each.

**Why are these bonds important?**

- Over the last few years, Green Bonds have emerged as an important financial instrument to deal with the threats of climate change and related challenges.
- The climate change threatens communities and economies, and it poses risks for agriculture, food, and water supplies. A lot of financing is needed to address these challenges.
- It's critical to connect environmental projects with capital markets and investors and channel capital towards sustainable development and Green Bonds are a way to make that connection.

**How beneficial is it for investors?**

- Green Bonds offer investors a platform to engage in good practices, influencing the business strategy of bond issuers.

- They provide a means to hedge against climate change risks while achieving at least similar, if not better, returns on their investment. In this way, the growth in Green Bonds and green finance also indirectly works to disincentivise high carbon-emitting projects.

**When did the Govt plan these bonds?**

- In August 2022, the government said it stands committed to reducing Emissions Intensity of GDP by 45 per cent from the 2005 level by 2030, and achieving about 50 per cent cumulative electric power installed capacity from non-fossil fuel-based energy resources by the same year.
- In line with the commitment to significantly reduce the carbon intensity of the economy, the Union Budget 2022-23 made an announcement to issue Sovereign Green Bonds.
- The issuance of the Sovereign Green Bonds will help the Indian government in tapping the requisite finance from potential investors for deployment in public sector projects aimed at reducing the carbon intensity of the economy.

**Where will the proceeds go?**

- The government will use the proceeds raised from SGrBs to finance or refinance expenditure (in parts or whole) for various green projects, including renewable energy, clean transportation, energy efficiency, climate change adaptation, sustainable water and waste management, pollution and prevention control and green buildings.
- In renewable energy, investments will be made in solar, wind, biomass and hydropower energy projects.

### SHRI SARBANANDA SONOWAL INAUGURATES NATIONAL LOGISTICS PORTAL-MARINE TO REDUCE THE LOGISTICS COST

**Why in news?**

- Recently, the Union Minister for Ports, Shipping and Waterways inaugurated the National Logistics Portal (marine) in New Delhi.
- The implementation of NLP had been initiated in July 2021 with the development of NLP Marine as a first phase.



### What is NLP?

- The National Logistic Portal (marine) (NLP) is a project of national importance, as envisaged by the Ministry of Ports Shipping Waterways and the Ministry of Commerce & Industry.
- It is a one-stop platform aimed at connecting all the stakeholders of the logistics community using IT, to improve efficiency and transparency by reducing costs and time delays and achieving easier, faster, and more competitive offerings of services, to promote the growth of the logistics sector and thereby improve trade.
- NLP will be a single window for all trade processes of the logistics sector spread across the country covering all modes of transport in the waterways, roadways, and airways along with an E-marketplace to provide a seamless end-to-end logistic service coverage.

### Salient features:

- It is an "open platform" that allows the coexistence of multiple service providers to provide EXIM-related services independently or by combining different connectivity options.
- It has the capability to integrate with various Port Operating Systems/ Terminal Operating Systems, ICEGATE, Other regulatory agencies, and stakeholder(s) systems in the ecosystem.
- It aims to reduce regulatory complexities and enhance the ease of doing business by moving towards user-friendly paperless trade.
- This will be accomplished by utilizing the prowess of IT infrastructure to develop a single window, centralizing all necessary documentation, compliance certifications, and formal procedures necessary for the EXIM trade.

### Integrated Platform for Exim Stakeholders:

#### Distinct verticals:

- The activities of NLP Marine are categorized into four distinct verticals viz. Carrier, Cargo, Banking and Finance and Regulatory Bodies and Participating Government Agencies (PGAs).
- This will enrich the user experience through end-to-end tracking of the shipment with notifications at each stage, seamless exchange of documents, and the ability to securely transact with transparency and speed.

#### Latch On feature:

- The NLP Marine experience is enhanced further with the Latch On feature, which facilitates the trade in providing the required features that are not directly embedded into NLP Marine, by linking through systems developed by other agencies seamlessly without duplication of efforts.
- It is envisaged that many standalone applications, developed by multiple vendors, users, and other stakeholders will integrate with NLP Marine through appropriate curation.

- It also enables digital transactions for payments required for the clearance processes such as Port charges, CFS charges, shipping line charges, transportation charges, etc.

### Way Forward:

- The Prime Minister on 15th August 2021 announced the PM Gati Shakti National Master Plan to provide systematic, multi modal connectivity to various economic zones for seamless movement of people, goods & services resulting in efficient conduct of logistics and economic activities.
- To fulfil this mission Ministry of Ports, Shipping and Waterways has developed the NLP (marine) is an "open platform" that allows the coexistence of multiple service providers to provide EXIM-related services independently or by combining different connectivity options.

## HOW WILL THE T+1 SETTLEMENT CYCLE IMPACT MARKETS?



### Why in news?

- Recently, the stock markets in India concluded its transition to the T+1 settlement regime. It has become the second largest market after China to have made the transition ahead of the U.S., Europe and Japan which adhere to the T+2 settlement cycle.
- The phased transition had begun on February 25, 2022 following markets regulator Securities and Exchange Board of India (SEBI)'s circular in September 2021.

### What is the T+1 settlement cycle about?

- A trade involves three important functions, execution of trade, clearing and settlement, carried out by separate entities.
- The clearing function entails the concerned entity determining the obligation of what is due to be delivered and what is to be received by the parties involved. Risk assessment of both parties is carried out at this stage.
- The process ensures that the parties have enough funds or transferrable assets for the transaction to go through. On the settlement date, funds and securities are transferred to their new owners. All of it is preceded by purchase or sale of a stock.

⇒ It is represented using 'T', that is, trade executed on a particular day. Since clearing used to take place the next day followed by another day for settlement, the previous mechanism was defined as 'T+2'. From now onwards, the settlement will be done the next day itself, thus, T+1.

**In a digital age, why is a settlement not done instantly?**

- ⇒ The process is complex and there are many entities involved. While instant settlement is impossible, even T+0 is extremely tough considering the time required for brokers to crystallise the obligations and then clearing corporations to settle.
- ⇒ An investor cannot directly buy or sell shares on a stock exchange. Registered members of a stock exchange, called stock brokers, trade on an investor's behalf.
- ⇒ Even though individuals can open a demat account on their own by contacting a depository participant (DP), they would require a trading account, which is provisioned by a SEBI-registered broker, to purchase or sell shares. The size and operational capability of the individual broker is another important factor.

**What is the debate around the T+1 regime?**

- ⇒ Global investment associations had observed the transition would require "end-to-end process redesign and substantial technology investments and enhancements to support near real-time processing capabilities and necessitating an extended migration timeline."
- ⇒ It added that this would be particularly true for overseas investors (such as those based in the U.S. and Europe) for participating in the Indian market owing to time zone differences and involvement of multiple parties (such as global and local custodians, FX banks and brokers) in different jurisdictions.
- ⇒ The United States' Securities and Exchange Commission (SEC) had also argued in its proposal (February 2022) that the more days that elapse between the execution of a trade and a counterparty default, the greater would be the variance of price change. In other words, it is likely that the asset's price would deviate from the execution price.



**Details:**

- ⇒ The "play safe" approach of the Indian Army that restricts the movement of the district administration and locals in forward areas has turned areas that were once accessible into informal "buffer" zones.
- ⇒ To avoid consternation with the Chinese People's Liberation Army (PLA) that has placed high-resolution cameras at vantage points, the Army restricts the movement of graziers by installing check-posts and deploying personnel in disguise.
- ⇒ The recent disengagement agreements at PP 15 and 16 resulted in the loss of pasture lands at Gogra hills, North Bank of Pangong Tso, and Kakjung areas.

**Background:**

- ⇒ There are at least 30 PPs in eastern Ladakh along Line of Actual Control (LAC) are not being patrolled any more by Indian troops.
- ⇒ These points were regularly patrolled before April-May 2020, when China started amassing troops close to the LAC in eastern Ladakh.
- ⇒ Twenty Indian soldiers were killed in violent clashes with the PLA on June 15, 2020; at least four Chinese soldiers were also killed.

**Salami Slicing:**

- ⇒ Presently, there are 65 PPs starting from Karakoram pass to Chumur which are to be patrolled regularly by the ISFs (Indian Security Forces). Out of 65 PPs, our presence is lost in 26 PPs (i.e. PP no. 5-17, 24-32, 37, 51,52,62) due to restrictive or no patrolling by the ISFs.
- ⇒ Later on, China, forces India to accept the fact that, as, such areas have not seen the presence of ISFs or civilians since long, the Chinese were present in these areas.
- ⇒ This leads to a shift in the border under control of ISFs towards Indian side and a buffer zone is created in all such pockets which ultimately leads to loss of control over these areas by India. This tactic of PLA to grab land inch-by-inch is known as Salami Slicing.

**Play safe strategy:**

- ⇒ LAC in eastern Ladakh is dominated by physical patrolling or technical means and "there is no loss of territory due to disengagement in friction areas".
- ⇒ The graziers are encouraged and all facilities are being provided in conjunction with the civil administration.

**DEFENCE & SECURITY**

**INDIA HAS LOST ACCESS TO 26 OUT OF 65 PATROLLING POINTS IN EASTERN LADAKH, SAYS RESEARCH PAPER**

**Why in news?**

- ⇒ India has lost access to 26 out of 65 Patrolling Points (PP) in eastern Ladakh, according to one of the research papers.

- The Army has placed significant restrictions on the movement of civilians and graziers near the forward areas on the Indian side, indicating with their play safe strategy that they do not want to annoy the PLA by giving them the chance to raise objections on the areas being claimed as disputed.

#### Reason for migration:

- The unfenced borders have been serving as pastures for the nomadic community of Changthang region (Rebos) and given the scarcity of the rich pastures, they would traditionally venture into the areas close to the PPs.
- Since 2014, enhanced restrictions on the grazing movement and areas have been imposed on the Rebos by ISFs and this has caused some resentment against them.
- The soldiers are especially deployed in disguise to stop the movement of Rebos to the higher reaches that could be objected by the PLA and similarly the development works in the border villages like Demchok, Koyul which are under direct electronic surveillance of the PLA suffers, as they raise objections promptly.
- Over the years, this has resulted in the loss of livelihood and change in lifestyle patterns of border villages, which has led to migration.

### SOCIAL ISSUE

#### FLIP THE PAGE TO THE CHAPTER ON MIDDLE SCHOOLCHILDREN



#### Context:

- After a gap of four years, the Annual Status of Education Report (ASER) report for 2022 was recently released in New Delhi.
- This nationwide household survey that covers all rural districts in the country generates estimates for schooling and basic learning for every State in India. Data from 2018 and 2022 can be compared with longer run trends over the last decade to see how the COVID-19 years have impacted India.

#### NEP 2020:

- The National Education Policy 2020 gives high

priority to the acquisition of foundational literacy and numeracy skills especially for children in early grades.

- "NIPUN Bharat" (where NIPUN is National Initiative for Proficiency in Reading with Understanding and Numeracy) the government's flagship programme designed to translate policy into practice, is beginning to have traction in many States.
- Given that the policy and implementation focus currently is on early years in primary school, it may be useful to also understand how older children in upper primary grades are faring.

#### Enrolment ratio:

- In 2018, the all-India rural enrolment figure for the age group 6-14 years was 97.2%. In ASER 2022 data, this is now 98.4%. The rise has been accompanied by a significant shift away from private schools to government schools.
- Several factors may be at play; decrease in family income, permanent closures of low-cost private schools, and the efforts of many State governments to provide services even when schools were closed such as mid-day meal rations, teaching-learning materials shared remotely, worksheet and textbook distribution.

#### Evaluation of rising enrolment:

- On the 'plus' side, rising enrolment means that more students can benefit for longer, sustained periods of time from schooling. Completion of the entire cycle of eight years of schooling for each cohort of 25 million students is no mean achievement in a country of India's size and diversity.
- On the 'minus' side, with more and more students going through the middle school pipeline and attending secondary schools, there is increased competition for post-secondary opportunities. Board examinations continue to perform a gatekeeping function.
- Acute examination stress, grade inflation in school-leaving examinations, difficulties of gaining admission into college, and lack of appropriate jobs for many school leavers are all consequences of high enrolment and completion rates.

#### ASER measurement mechanism:

- Since its inception, ASER has measured foundational skills in reading and arithmetic. The highest reading task on the ASER tool is reading a text at Grade II level of difficulty.
- In mathematics, the highest level is a numerical three-digit by one-digit division problem, usually expected of children in standard four or so. The assessment is done one on one with each sampled child in the household. The child is marked at the highest level that she/he can comfortably reach. The same tasks are used for all children aged 5 years to 16 years.

- ASER data shows that even in 2018, basic skills of children in upper primary grades left a lot to be desired: less than a third of all children in standard five and less than half of those in standard eight could do division in pre-COVID-19 times.
- These low levels which are worrying declined further between 2018 and 2022, especially in reading. ASER evidence suggests that basic learning levels of middle schoolchildren have remained low and stagnant for over a decade. The “value” add of each year of middle school is small.

### Conclusion:

- In the last 10 years, much has changed such as new technologies, new knowledge domains, and new ways of operating. But within our school systems, many children are reaching standard eight without being sufficiently equipped with foundational literacy and numeracy skills, let alone higher-level capabilities.
- Unless children have strong foundational skills, they cannot acquire higher level skills or develop advanced content knowledge.
- ASER data shows that an “overambitious” curriculum and the linear age-grade organisational structure of Indian schools result in a vast majority of children getting “left behind” early in their school career.
- In the absence of in-school mechanisms for “catch up”, children fall further and further behind academically. With this comes low motivation to learn and a lack of self-confidence. At the same time, as children reach higher grades, parental and family aspirations for the child’s future increase.

### Way Forward:

- Much of the country’s efforts in school education today are focused on ensuring strong foundations for children in the early years. But it is critical that we remember that middle schoolchildren also urgently need support for learning recovery and “catch up”.

## EDUCATION

### UGC UNVEILS DRAFT NORMS TO ALLOW FOREIGN UNIVERSITIES TO SET UP CAMPUSES IN INDIA

#### Why in news?

- The University Grants Commission (UGC) has announced draft norms for facilitating foreign universities and educational institutions to set up campuses in India which allow them autonomy in determining fees, as well as a 90-day approval process.

#### Criteria:

- A foreign university with a rank among the top 500 global rankings or a foreign educational institution of

repute in home jurisdiction can apply to the UGC to set up a campus in India.



- The application will be considered by a standing committee appointed by the UGC which will submit its recommendations within 45 days after examining the institution’s credibility, programmes offered, their potential to strengthen educational opportunities in India, proposed academic infrastructure.
- Subsequently, within 45 days, the UGC may grant in-principle approval to the foreign institution to set up campuses in India within two years. The initial approval will be for 10 years, which can be extended.

#### Autonomy to foreign universities:

- Such a campus can evolve its own admission process and criteria to admit domestic and foreign students. It will also have autonomy to decide its fee structure, and will face no caps that are imposed on Indian institutions. The fee should be “reasonable and transparent”.
- It will also have autonomy to recruit faculty and staff from India and abroad. The courses to be offered cannot be in online and open and distance learning mode.
- The qualifications awarded to the students on the Indian campus should have equivalence with those awarded by the institutions in their country of origin.
- Foreign higher education institutions will also be allowed cross-border movement of funds and maintenance of foreign currency accounts, mode of payments, remittance, repatriation, and sale of proceeds, under the Foreign Exchange Management Act (FEMA), 1999 and its Rules and an audit report will have to be submitted to the UGC.

## CULTURE

### ASI SHOULD COME UP WITH SUBSTANTIVE CRITERIA: EAC ON NATIONAL MONUMENTS

#### Why in news?

- Recently, in a report titled ‘Monuments of National Importance - Urgent Need for Rationalisation’, the Economic Advisory Council to the Prime Minister (EAC-PM) pointed out that expenditure on the

conservation and maintenance of monuments of national importance is inadequate.



### Recommendations:

- Archaeological Survey of India (ASI) should come up with substantive criteria and a detailed procedure for declaring monuments to be of national importance.
- It also should publish a book of notifications with detailed information about the provenance of all Monuments of National Importance (MNI).
- It also recommended that the proceeds from these monuments should vest with the implementing bodies.
- It also recommended that minor monuments and antiquities protected as monuments should be denotified as MNI and monuments with local importance should be transferred to respective states for protection.

### MNI:

- India currently has 3,695 MNI that are under the protection of ASI.
- The Ancient Monuments and Archaeological Sites and Remains Act (AMASR Act), 1958, (amended in 2010) provides for the declaration and conservation of ancient and historical monuments and archaeological sites and remains of national importance.

### Need for review:

- A large number of the present list of MNI were identified as such before 1947 under colonial-era laws. No attempts were made to comprehensively review the list after independence.
- The EAC-PM is of the view that an effort should be made to restore geographical balance in the list of MNI.
- Around 75 British cemeteries/graves are considered as 'monuments of national importance'.
- Also, various monuments declared as MNI are of local importance and do not necessarily have national significance per se and 24 monuments of national importance are untraceable.
- Over 60 per cent of MNI are located in just 5 states - Uttar Pradesh, Karnataka, Tamil Nadu, Madhya Pradesh and Maharashtra.
- While the city of Delhi alone has 173 MNI, states like Telangana (8), Bihar (70), and Odisha (80) have disproportionately fewer MNI.

## ENVIRONMENT

### CORAL CRYOPRESERVATION



### Why in news?

- In 2020, scientists at the Australian Institute of Marine Science (AIMS) conducted a trial of coral cryopreservation on the Great Barrier Reef. This was the first time that coral cryopreservation had been attempted on a large scale in the field.
- The trial involved collecting small pieces of coral from the Great Barrier Reef and freezing them in liquid nitrogen. The coral was then thawed and transplanted onto a damaged section of the reef in the hope that it would survive and grow.
- The trial was part of a larger research project called the Great Barrier Reef Restoration and Adaptation Program, which is aimed at finding ways to protect and restore the Great Barrier Reef in the face of climate change and other threats.

### What is 'coral cryopreservation'?

- Coral cryopreservation is a technique that involves preserving coral tissue or gametes (eggs and sperm) at very low temperatures, often using liquid nitrogen.
- The goal of coral cryopreservation is to maintain the genetic diversity of coral species and to provide a means of propagating coral populations in the future.

### Positive impacts:

- Genetic diversity: Coral cryopreservation can help to preserve the genetic diversity of coral species, which can help to ensure the long-term survival of these species and the ecosystems they support.
- Propagation: Coral cryopreservation can provide a means of propagating coral populations, which can help to restore damaged reefs and support the recovery of coral reefs.
- Biodiversity: Coral reefs are home to a wide range of marine life, and they support the ecosystems that these species rely on. Coral cryopreservation can help to preserve the biodiversity of coral reefs.

### Negative impacts:

- Cost: Cryopreservation can be a costly process, and it may not be feasible for all coral reefs or coral species.
- Limited success: Cryopreservation is still a relatively new technique, and it is not yet clear how well it will work for all coral species. There is a risk that

cryopreservation may not be successful for all coral species or may not be able to preserve all of the genetic diversity of a species.

- Limited practical application: Cryopreservation may not be a practical solution for many coral reefs, especially those that are located in remote or hard-to-reach areas.
- Ethical considerations: There are also ethical considerations to consider when it comes to cryopreservation, including questions about the role of humans in conserving and restoring natural ecosystems and the potential impacts on local communities and economies.

### What are coral reefs?

- Coral reefs are underwater structures made up of skeletons of coral, which are marine animals that secrete calcium carbonate to form hard, protective shells. It is found in shallow, warm waters in tropical and subtropical regions around the world.
- Coral reefs are some of the most diverse and productive ecosystems on earth, supporting a wide range of marine life, including fish, invertebrates, and other organisms.
- It also provides a number of important benefits to humans, including coastal protection, fisheries, tourism, and pharmaceuticals.

### Significance of coral reefs:

- Coastal protection: Coral reefs provide a natural barrier that can help to protect coastlines from the impacts of storms and waves. This can help to reduce the risk of flooding and erosion, which can have serious consequences for human communities and infrastructure.
- Fisheries: Coral reefs support important fisheries that provide food and income for millions of people around the world. Protecting coral reefs can help to ensure the long-term sustainability of these fisheries.
- Tourism: Coral reefs are a major attraction for tourists, and they support important industries such as diving and snorkelling. Protecting coral reefs can help to ensure the long-term viability of these industries and the jobs and income they provide.
- Carbon sequestration: Coral reefs absorb and store carbon dioxide from the atmosphere, which can help to mitigate the greenhouse effect and slow the rate of global warming.
- Medicine: Coral reefs are a source of new drugs and other medical treatments that are being developed to address a variety of health issues. Protecting coral reefs can help to ensure that we have access to these important resources in the future.

### Alternatives to coral cryopreservation:

- Coral propagation and transplantation: This involves collecting small pieces of coral from existing reefs and growing them in a laboratory or on a coral farm.

The propagated coral can then be transplanted back onto reefs to help restore damaged areas.

- Coral gardening: This involves collecting fragments of coral and attaching them to a substrate (such as a metal frame or PVC pipe) in a sheltered area. The coral fragments can then grow and eventually be transplanted onto reefs to help restore damaged areas.
- Artificial reefs: Artificial reefs are man-made structures that are designed to mimic the functions of natural reefs. They can be used to provide habitat for marine life and to help protect coastlines from erosion and storms.
- Restoration and rehabilitation: This involves a variety of approaches to help restore damaged reefs, including removing debris and invasive species, replanting coral, and improving water quality.

## S ASIAN BLACK CARBON AEROSOLS INCREASE GLACIAL MASS LOSS IN TIBET: STUDY



### Why in news?

- Black carbon aerosols have indirectly affected the mass gain of the Tibetan Plateau glaciers by changing long-range water vapour transport from the South Asian monsoon region, a study has found.
- The South Asia region adjacent to the Tibetan Plateau has among the highest levels of black carbon emission in the world.

### Black carbon:

- Black carbon aerosols are produced by the incomplete combustion of fossil fuels and biomass, and are characterised by strong light absorption.
- Many studies have emphasised black carbon aerosols from South Asia can be transported across the Himalayas to the inland region of the Tibetan Plateau.

### Observations made:

- Researchers noted that black carbon deposition in snow reduces the albedo of surfaces, a measure of how much of Sun's radiations are reflected, which may accelerate the melting of glaciers and snow cover, thus changing the hydrological process and water resources in the region.
- The study found that since the 21st century, South Asian black carbon aerosols have indirectly affected

the mass gain of the Tibetan Plateau glaciers by changing long-range water vapour transport from the South Asian monsoon region.

### Impact:

- Black carbon aerosols in South Asia heat up the middle and upper atmosphere, thus increasing the North-South temperature gradient.
- Accordingly, the convective activity in South Asia is enhanced, which causes convergence of water vapour in South Asia. Meanwhile, black carbon also increases the number of cloud condensation nuclei in the atmosphere.
- These changes in meteorological conditions caused by black carbon aerosols make more water vapour form precipitation in South Asia, and the northward transport to the Tibetan Plateau was weakened.
- As a result, precipitation in the central and the southern Tibetan Plateau decreases during the monsoon, especially in the southern Tibetan Plateau.
- The decrease in precipitation further leads to a decrease of mass gain of glaciers. From 2007 to 2016, the reduced mass gain by precipitation decrease accounted for 11 per cent of the average glacier mass loss on the Tibetan Plateau and 22.1 per cent in the Himalayas.

### What's next?

- The transboundary transport and deposition of black carbon aerosols from South Asia accelerate glacier ablation over the Tibetan Plateau.
- Meanwhile, the reduction of summer precipitation over the Tibetan Plateau will reduce the mass gain of plateau glaciers, which will increase the amount of glacier mass deficit.

## RHINOS DISPERSED ACROSS SOUTH, CENTRAL ASIA VIA TIBET: STUDY



### Why in news?

- The giant rhino, *Paraceratherium*, was the largest land mammal that ever lived and was found primarily in Asia, particularly in China, Mongolia, Kazakhstan, and Pakistan.
- However, it was long unknown how this genus spread across Asia. A recent discovery has shed new light on this process.

### New species:

- Researchers recently, reported a new species, *Paraceratherium linxiaense* sp. nov., which offers important clues to the dispersal of giant rhinos across Asia.
- The new species' fossils comprise a completely preserved skull and mandible with their associated atlas, as well as an axis and two thoracic vertebrae from another individual.
- The fossils were recovered from the Late Oligocene deposits of the Linxia Basin in Gansu Province, China, which is located on the northeastern border of the Tibetan Plateau.
- Phylogenetic analysis yielded a single most parsimonious tree, which places *P. linxiaense* as a derived giant rhino, within the monophyletic clade of the Oligocene Asian *Paraceratherium*.

### Six species:

- Within the *Paraceratherium* clade, the researchers' phylogenetic analysis produced a series of progressively more-derived species—from *P. grangeri*, through *P. huangheense*, *P. asiaticum*, and *P. bugtiense*—finally terminating in *P. lepidum* and *P. linxiaense*.
- *P. linxiaense* is at a high level of specialization, similar to *P. lepidum*, and both are derived from *P. bugtiense*.
- Adaptation of the atlas and axis to the large body and long neck of the giant rhino already characterized *P. grangeri* and *P. bugtiense*, and was further developed in *P. linxiaense*, whose atlas is elongated, indicative of a long neck and higher axis with a nearly horizontal position for its posterior articular face. These features are correlated with a more flexible neck.
- The giant rhino of western Pakistan is from the Oligocene strata, representing a single species, *Paraceratherium bugtiense*. On the other hand, the rest of the genus *Paraceratherium*, which is distributed across the Mongolian Plateau, northwestern China, and the area north of the Tibetan Plateau to Kazakhstan, is highly diversified.

### Findings:

- The researchers found that all six species of *Paraceratherium* are sisters to *Aralotherium* and form a monophyletic clade in which *P. grangeri* is the most primitive, succeeded by *P. huangheense* and *P. asiaticum*.
- The researchers were thus able to determine that, in the Early Oligocene, *P. asiaticum* dispersed westward to Kazakhstan and its descendant lineage expanded to South Asia as *P. bugtiense*. In the Late Oligocene, *Paraceratherium* returned northward, crossing the Tibetan area to produce *P. lepidum* to the west in Kazakhstan and *P. linxiaense* to the east in the Linxia Basin.

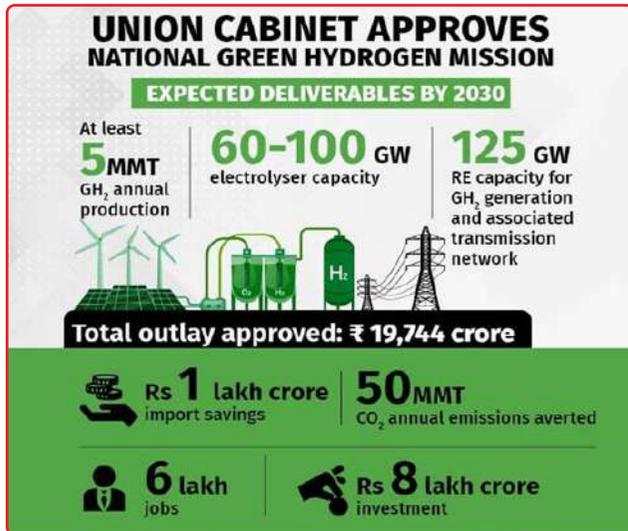
**Migration in Oligocene:**

- The researchers noted the aridity of the Early Oligocene in Central Asia at a time when South Asia was relatively moist, with a mosaic of forested and open landscapes. Late Oligocene tropical conditions allowed the giant rhino to return northward to Central Asia, implying that the Tibetan region was still not uplifted as a high-elevation plateau.
- During the Oligocene, the giant rhino could obviously disperse freely from the Mongolian Plateau to South Asia along the eastern coast of the Tethys Ocean and perhaps through Tibet.
- The topographical possibility that the giant rhino crossed the Tibetan area to reach the Indian-Pakistani subcontinent in the Oligocene can also be supported by other evidence.
- Up to the Late Oligocene, the evolution and migration from *P. bugtiense* to *P. linxiaense* and *P. lepidum* show that the "Tibetan Plateau" was not yet a barrier to the movement of the largest land mammal.

**CABINET APPROVES NATIONAL GREEN HYDROGEN MISSION**

**Why in news?**

- Recently, the Union Cabinet has approved National Green Hydrogen Mission.
- The initial outlay for the Mission will be Rs.19,744 crore, including an outlay of Rs.17,490 crore for the SIGHT programme, Rs.1,466 crore for pilot projects, Rs.400 crore for R&D, and Rs. 388 crore towards other Mission components.
- MNRE will formulate the scheme guidelines for implementation of the respective components.



**The Mission will result in the following likely outcomes by 2030:**

- Development of green hydrogen production capacity of at least 5 MMT (Million Metric Tonne) per annum

- with an associated renewable energy capacity addition of about 125 GW in the country
- Over Rs. Eight lakh crore in total investments.
- Creation of over Six lakh jobs.
- Cumulative reduction in fossil fuel imports over Rs. One lakh crore.
- Abatement of nearly 50 MMT of annual greenhouse gas emissions.

**Significance:**

**The Mission will have wide ranging benefits:**

- creation of export opportunities for Green Hydrogen and its derivatives;
- Decarbonisation of industrial, mobility and energy sectors;
- reduction in dependence on imported fossil fuels and feedstock;
- development of indigenous manufacturing capabilities;
- creation of employment opportunities; and
- development of cutting-edge technologies.

**Targets:**

- India's Green Hydrogen production capacity is likely to reach at least 5 MMT per annum, with an associated renewable energy capacity addition of about 125 GW.
- The targets by 2030 are likely to bring in over Rs. 8 lakh crore investments and create over 6 lakh jobs. Nearly 50 MMT per annum of CO<sub>2</sub> emissions are expected to be averted by 2030.

**Key Highlights:**

- The Mission will facilitate demand creation, production, utilization and export of Green Hydrogen.
- Under the Strategic Interventions for Green Hydrogen Transition Programme (SIGHT), two distinct financial incentive mechanisms – targeting domestic manufacturing of electrolysers and production of Green Hydrogen – will be provided under the Mission.
- The Mission will also support pilot projects in emerging end-use sectors and production pathways. Regions capable of supporting large scale production and/or utilization of Hydrogen will be identified and developed as Green Hydrogen Hubs.
- An enabling policy framework will be developed to support establishment of Green Hydrogen ecosystem. A robust Standards and Regulations framework will be also developed.
- Further, a public-private partnership framework for R&D (Strategic Hydrogen Innovation Partnership – SHIP) will be facilitated under the Mission; R&D projects will be goal-oriented, time bound, and suitably scaled up to develop globally competitive technologies. A coordinated skill development programme will also be undertaken under the Mission.

**Implementation:**

- All concerned Ministries, Departments, agencies and institutions of the Central and State Governments will undertake focussed and coordinated steps to ensure successful achievement of the Mission objectives.
- Ministry of New & Renewable Energy will be responsible for overall coordination and implementation of the Mission.

### 1ST ALL INDIA ANNUAL STATES' MINISTERS CONFERENCE ON "WATER VISION@2047"

**Why in news?**

- Recently, the 1st All India Annual States' Ministers Conference on "Water Vision@2047" began in Bhopal, Madhya Pradesh.
- The ceremony was followed by a special address by Prime Minister, Shri Narendra Modi via video message wherein PM highlighted the importance of the Conference of Water Ministers of the country.

**Objective:**

- The objective of the conference is to deliberate on Water Vision for India for the next 25 years i.e., till 2047 as part of the larger plan of India@2047 as envisioned by Prime Minister Modi.
- The forum aims to bring together key policymakers for debating and deliberating on ways to optimally utilise water resources for holistic economic and human development in a sustainable manner.

**Key Highlights:**

- PM highlighted that water is a state subject as per the Constitution of India and therefore, it is the states' efforts for water conservation that will go a long way in achieving the collective goals of the country.
- The dignitaries launched the National Framework on Reuse of Treated Waste Water, National Framework for Sedimentation Management, Best practices under Jal Shakti Abhiyan: Catch the Rain and inaugurated a sub-portal of 'Jal Itihas' under the WRIS portal as part of Azadi Ka Amrit Mahotsav along with an exhibition.

**Jal Shakti Abhiyan:**

- The Jal Shakti Abhiyan launched by the Prime Minister, which brought together various organizations, Panchayats, NGOs, Celebrities etc., has

started showing good results as can be seen through the ground water report released.

- This has led to a reduction in the over exploited, critical and semi critical number of blocks while safe blocks have increased by more work needs to be done in this field with a focused approach".

**Way Forward:**

- India's water availability of 4,000 BCM through rain, glaciers or international basins, out of which, total harvestable component which is usable is half of this.
- Climate change has changed rainfall patterns with scanty and erratic rainfall which has and continues to negatively impacted this harvestable component.
- Along with climate change, rapid urbanization, increased demand of water and water pollution together have reduced the per capita availability of water from 5000 CM to 1500 CM and by 2047 it might further reduce to 1200 CM and therefore, state must discuss ways to overcome this challenge holistically".

### WHY IS JOSHIMATH SINKING? ALARM BELLS IN HILL TOWN RINGING SINCE 1976

**Why in news?**

- Recently, Joshimath is making headlines for the wrong reason: it is sinking.
- Residents are protesting and have raised concerns about the land beneath the town sinking. Residents say houses have developed cracks and that they are forced to find support structures to keep their homes from falling under their own weight.
- Over 500 houses in the region have developed cracks.

**Location:**

- Joshimath is a hilly town located on the Rishikesh-Badrinath National Highway (NH-7) in the state of Uttarakhand.
- The city serves as a tourist town as it acts as an overnight rest stop for people visiting Badrinath, Auli, Valley of Flowers, and Hemkund Sahib, among other important religious and tourist locations in the state.
- Joshimath is also of great strategic importance to the Indian armed forces and is home to one of the Army's most important cantonments.
- The town is located on a running ridge that is traversed by running streams with a high gradient

from Vishnuprayag, a confluence of the Dhauliganga and the Alaknanda rivers. A 2022 report stated that the area around Joshimath is covered with thick layers of overburdened material.

#### Mishra Commission:

- While the panic over the Joshimath sinking is making headlines now, scientists and geologists working in the area have been sounding the alarm for decades.
- The first such report indicating the grave problem that could threaten life and property came in 1976. That report by the government-appointed Mishra Commission pointed that Joshimath is located on the site of an ancient landslide.

#### Why is Joshimath sinking?

- The biggest reason why Joshimath is sinking is related to the geography of the town. The landslide debris on which the city was established has a low bearing capacity and experts have long warned that it cannot support a high rate of construction.
- Increased construction, hydroelectric projects, and the widening of the National Highway have made the slopes highly unstable in the last couple of decades.
- Erosion due to the running streams from Vishnuprayag and sliding along the natural streams are the other reasons behind the city's fate. Scattered rocks in the area are covered with old landslide debris comprising boulders, gneissic rocks, and loose soil.
- According to a 2022 survey conducted by researchers from the Wadia Institute of Himalayan Geology, these gneissic rocks are highly weathered and have a low cohesive value with a tendency of high pore pressure when saturated with water, especially during monsoons.
- Essentially, the land and the soil under Joshimath have a low capacity of holding together, especially when burdened with extra construction.

#### Drainage system:

- Seepage from streams uphill has been observed, which may have loosened the soil of Joshimath. The nalas disappear underground and arise overground downhill, bringing totally muddy water, and then join the Dhauliganga or the Alaknanda (beyond Vishnuprayag).
- The drainage system of the town of Joshimath is not well maintained. Waste water from the days' usage flows through improper drains.
- The nalas have been blocked by sludge that came from the 2013 Himalayan tsunami, which also facilitated the toe erosion in the region.
- The Rishiganga flood disaster also worsened the situation, followed by incessant rainfall between August to October in 2021.

#### What can be done to save Joshimath?

- Experts recommend a complete shutdown of development and hydroelectric projects in the region.

But the urgent need is to relocate the residents to a safer place and then reimagine the town's planning to accommodate the new variables and the changing geographical factors.

- Drainage planning is one of the biggest factors that needs to be studied and redeveloped.
- The city is suffering from poor drainage and sewer management as more and more waste is seeping into the soil, loosening it from within. The irrigation department has been asked by the state government to look into the issue and create a new plan for the drainage system.
- Experts have also suggested replantation in the region, especially at the vulnerable sites to retain soil capacity.
- There is a need for a coordinated effort between the government and civil bodies with the aid of military organizations like the BRO to save Joshimath.

#### IN 2022, MADHYA PRADESH LOSES MORE THAN DOUBLE BIG CATS COMPARED TO KARNATAKA



#### Why in new?

- Karnataka, home to 524 tigers as per the 2018 census, is competing with Madhya Pradesh (526) for the tag of India's 'tiger State'

#### Current Tiger Census:

- The national tiger census is conducted once in every four years. The latest All India Tiger Estimation (AITE) was conducted in 2022 and its report is scheduled to be released in 2023.
- Madhya Pradesh lost 34 tigers in 2022, while its nearest rival for the "tiger State" status, Karnataka recorded the death of 15 big cats, according to data by the National Tiger Conservation Authority (NTCA).
- The NTCA is a statutory body under the Ministry of Environment, Forests and Climate Change constituted under the Wildlife (Protection) Act, 1972, for strengthening tiger conservation.
- Total tiger deaths in India in the previous year stood at 117.

#### Longevity:

- The average age of tigers is 12 to 18 years.
- If longevity criteria are taken into account, then about

- 40 deaths annually should be considered natural as the State had recorded the presence of 526 tigers in the last estimation conducted in 2018.
- In 2021, Madhya Pradesh lost 42 tigers out of 127 fatalities recorded in the country that year.
  - Around 250 cubs are born annually in Madhya Pradesh, which is home to six tiger reserves—Kanha, Bandhavgarh, Pench, Satpura, Panna and Sanjay-Dubri.
  - Of the 34 tiger fatalities recorded in Madhya Pradesh during 2022, the biggest loss was suffered by the Bandhavgarh Tiger Reserve, where nine big cats died in the 12-month period, followed by Pench (five) and Kanha (four).

#### 'Tiger State' status:

- Madhya Pradesh (257 big cats) had lost the 'tiger State' tag to Karnataka (300) in the All-India Tiger Estimation exercise of 2010.
- In 2006, Madhya Pradesh had got the 'tiger State' status with 300 big cats compared to 290 in Karnataka.
- Panna is now estimated to inhabit around 70 tigers following a decade-long reintroduction programme.
- In the 2014 census, MP slipped to third position in the country with a population of 308 tigers, after Uttarakhand (340) and Karnataka (406).
- Madhya Pradesh regained the top position in the 2018 tiger census after it was found to be home to 526 felines, two more than Karnataka (524). Uttarakhand held the third position with 442 big cats.
- The estimated count of tigers in India had increased from 1,411 in 2006 to 2,967 in 2018.

### 3,700 INDIAN DAMS WILL LOSE 26% STORAGE CAPACITY BY 2050: UN STUDY



#### Why in news?

- Around 3,700 dams in India will lose 26 per cent of their total storage by 2050 due to accumulation of sediments which can undermine water security, irrigation and power generation in future, warns a new study by the United Nations.

#### Background:

- The Central Water Commission, had in 2015, reported that among 141 large reservoirs which are over

50-years-old, one quarter had lost at least 30 per cent of their initial storage capacity.

- Trapped sediment has already robbed roughly 50,000 large dams worldwide of an estimated 13 to 19 per cent of their combined original storage capacity.

#### Details:

- The study by the United Nations University Institute on Water, Environment and Health (UNU-INWEH), also known as the UN's think tank on water, shows that 6,316 billion cubic metre of initial global storage in 47,403 large dams in 150 countries will decline to 4,665 billion cubic metre, causing 26 per cent storage loss by 2050.
- The loss of 1,650 billion cubic metre storage capacity is roughly equal to the annual water use of India, China, Indonesia, France and Canada combined.

#### Asia-Pacific region:

- In 2022, the Asia-Pacific region, the world's most heavily dammed region, is estimated to have lost 13 per cent of its initial dam storage capacity. It will have lost nearly a quarter (23 per cent) of initial storage capacity by mid-century.
- The region is home to 60 per cent of the world's population and water storage is crucial for sustaining water and food security.
- China, meanwhile, the world's most heavily dammed nation, has lost about 10 per cent of its storage and will lose a further 10 per cent by 2050.

#### Water storage:

- Water storage infrastructure is critical for development. Large dams and reservoirs provide hydroelectricity, flood control, irrigation, and drinking water and often perform multiple functions simultaneously.
- Accumulation of sediments decreases a reservoir's capacity over the years and determines a reservoir's life expectancy.
- A dam is considered large if it is higher than 15 m or between 5 and 15 m high, but impounds over 3 million cubic metres.

### OZONE LAYER TO RECOVER IN 4 DECADES BUT AEROSOL INJECTION MAY UNDO GAINS: UNEP



**Why in news?**

- The successful phasing out of banned substances as envisioned by the Montreal Protocol has set the stage for a complete recovery of the ozone layer by the 2060s, a United Nations-backed panel of experts said.
- While this is an achievement, the scientists warned of the detrimental effects of geoengineering technologies such as stratospheric aerosol injection on the ozone layer.

**First ozone hole:**

- The first ozone hole was discovered in the stratospheric layers over the Antarctic in 1985, which allowed harmful ultraviolet (UV) radiation to pass into the lowest layer of the Earth's atmosphere (troposphere) where humans live.
- UV radiation is linked with health hazards such as skin cancer, cataracts and other conditions in the eye and reduced immunity.

**Outcome of Montreal Protocol:**

- The Montreal Protocol enforced in 1989 called for a ban on the use and trade of 100 ozone-depleting substances (ODS), and 99 per cent of these have been successfully phased out.
- If current policies remain in place, the ozone layer is expected to recover to 1980 values (before the appearance of the ozone hole) by around 2066 over the Antarctic, by 2045 over the Arctic and by 2040 for the rest of the world.
- The concentration of most of these substances in the atmosphere peaked in the 1990s and has been on a decline in the decades since the Montreal Protocol was brought into force.
- In August 2022, the global concentration of ODS reverted to the 1980s level, a major milestone in the ozone layer recovery efforts.
- But, once released, these substances linger in the atmosphere for a long time and continue to deplete the stratospheric ozone layer. Also, the reduction of ODS concentration over the Antarctic has been slow. Thus, it will still take almost four decades for the ozone layer to fully recover.

**SAI:**

- For the first time, the Scientific Assessment Panel examined the potential effects on ozone of the intentional addition of aerosols into the stratosphere, known as stratospheric aerosol injection (SAI), the panel noted during the meeting.
- SAI can increase sunlight reflection, thereby lowering the amount of heat that enters the troposphere. But this method "could also affect stratospheric temperatures, circulation and ozone production and destruction rates and transport".
- Injection of sulphuric acid into the stratosphere, for example, would damage the ozone layer.

- Aerosol sprays, like other commonly used substances such as dry cleaning solvents, refrigerants and fumigants, contain ODS.

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**BLACKBUCKS IN INDIA ARE FIGHTING TO SURVIVE IN A UNIQUE WAY**


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**Why in news?**

- Blackbucks, the Indian antelope, is braving the climate and human-led disasters in their own way.
- The species is found to be splitting its population into two clusters to spread its diversity and reach, researchers found by analysing the genetic profiles of blackbucks found across the country.

**Habitat:**

- Blackbucks found only in the Indian subcontinent are mostly seen in three broad clusters across India that pertain to the northern, the southern, and the eastern regions.
- While the males have corkscrew-shaped horns and black-to-dark brown coats, the females are fawn-coloured.

**The latest study:**

- Researchers at the Indian Institute of Science (IISc) have shed light on how blackbucks in India have fared in the face of natural and human-induced challenges to their survival as indiscriminate cutting of trees and construction across rivers slices up their natural landscapes.
- The study states that the genetic diversity of organisms is an indicator of their long-term survival and can potentially be shaped by the extent of gene flow between populations.

**How study was conducted?**

- The study looked at the genetic variation in an endemic species, the Antelope cervicapra or blackbuck, throughout its distribution range.
- They collected faecal samples of blackbucks from 12 different locations spread across eight states of India. They extracted and sequenced the DNA from the faecal samples to study the genetic makeup of blackbucks, and deployed computational tools to map the geographic locations with the genetic data.

**Findings:**

- The genetic data revealed that an ancestral blackbuck population first split into two groups: the northern and the southern cluster.
- The eastern cluster seems to have emerged from the southern cluster. They then found that despite all odds, male blackbucks appear to disperse more than expected, thus contributing to gene flow in this species.
- Meanwhile, the female population appear to stay largely within their native population ranges, which the researchers inferred from unique mitochondrial signatures in each population.

**Way Forward:**

- Researchers are now looking to unravel the blackbucks' secrets to surviving in the face of human-induced threats to their landscape, by studying changes in their DNA and gut microbiome.

### WHERE DO INDIAN CITIES STAND ON TOXIC AIR?

**Context:**

- Four years since the Centre launched the National Clean Air Campaign (NCAP), analysts found that progress has been slow and pollution only incrementally reduced in most cities.

**What is the NCAP?**

- Following years of evidence that many Indian cities were among the most polluted in the world, the government launched the NCAP that committed funds as well as set targets for 131 of India's most polluted cities on January 10, 2019.
- The 131 cities are called non-attainment cities, as they did not meet the national ambient air quality standards (NAAQS) for the period of 2011-15 under the National Air Quality Monitoring Programme (NAMP).

**What are the target levels?**

- The country's current, annual average prescribed limits for the two main classes of particulate matter (PM2.5 and PM10) are 40 micrograms/per cubic metre (ug/m<sup>3</sup>) and 60 micrograms/per cubic metre.
- The NCAP initially set a target of reducing key air pollutants PM10 and PM2.5 by 20-30% in 2024, taking

the pollution levels in 2017 as the base year to improve upon.

- In September 2022, however, the Centre moved the goalposts and set a new target of a 40% reduction in particulate matter concentration, but by 2026.
- To meet these targets, approximately ₹6,897.06 crore has been disbursed to the cities by the government. For administering funds, the Central Pollution Control Board (CPCB), which coordinates the programme, looks at a city's PM10 levels – the relatively larger, coarser particles.
- However, PM2.5, the smaller, more dangerous particles, aren't monitored as robustly in all cities, mostly due to the lack of equipment.

**How effective has the NCAP been?**

- An analysis of the four-year performance of the NCAP by the Centre for Research on Energy and Clean Air (CREA), found that only 38 of the 131 cities that were given annual pollution reduction targets under agreements signed between State Pollution Control Boards (SPCBs), Urban Local Bodies (ULBs) and the Centre managed to meet the targets for FY21-22.
- The CREA noted that 37 cities have completed the source apportionment studies. However, most of these reports weren't available in the public domain and no city action plan had been updated with information from these studies, as they were supposed to be under the NCAP programme.
- The CREA estimates that India will need to install more than 300 manual air quality monitoring stations per year to reach the NCAP goal of 1,500 monitoring stations by 2024. Only 180 stations have been installed over the last four years.

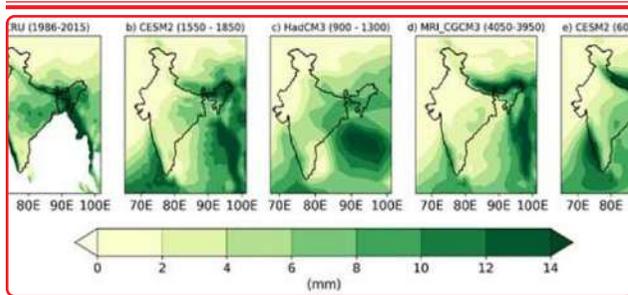
**Has NCAP managed to reduce pollution?**

- The NCAP Tracker, a joint project by two organisations active in air pollution-policy, Climate Trends and Respirer Living Sciences, have been monitoring progress in achieving the 2024 clean air targets set under the NCAP.
- Among these cities, the national capital of Delhi ranked the most polluted in 2022, with an annual average PM2.5 concentration of 99.71 ug/m<sup>3</sup>. But Delhi's PM2.5 levels have improved by over 7% compared to 2019. Most cities in the top 10 most polluted list of 2022 were from the Indo-Gangetic Plain.
- All three of Bihar's non-attainment cities, Patna, Muzaffarpur and Gaya, now feature in the top 10 most polluted cities on the basis of PM2.5 levels. Nine of the 10 cities, which were the most polluted in 2019, have reduced their PM2.5 and PM10 concentrations though the levels in these cities remain much higher than CPCB's annual average safe limits for PM2.5 and PM10.
- In September 2022, the Centre for Science and Environment reported that based on PM2.5 levels,

only 14 of 43 (NCAP) cities registered a 10% or more reduction in their PM<sub>2.5</sub> level between 2019 and 2021. Only 43 cities were considered as only they had adequate data to scientifically establish a long-term trend.

- On the other hand, out of 46 non-NCAP cities with adequate data, 21 recorded significant improvement in their annual PM<sub>2.5</sub> value with 5% or more decline between 2019 and 2021.
- There were 16 NCAP cities and 15 non-NCAP cities that registered a significant increase in their annual PM<sub>2.5</sub> levels with near identical numbers. This suggested that non-NCAP and NCAP cities were as likely to be polluted, with the NCAP regime having limited effectiveness.

### STUDY TRACES HIGH RAINFALL IN NORTHERN BAY OF BENGAL THAN THE OTHER PARTS OF INDIA FOR THE LAST 10000 YEARS



#### Why in news?

- Regions surrounding northern Bay of Bengal (BoB) received higher precipitation than the other parts of India for the last 10200 years, says a new study.
- The study has traced the dynamics of Indian Summer Monsoon Rainfall (ISM) over the 10000 years, a period which witnessed the development and fall of numerous ancient civilizations around the world, many of which were associated with climate instability.
- The study can help understand long-term trends of climate change impacts on the ecosystems and may help mitigate future climate extremities.

#### Why it matters?

- Agriculture in India is heavily dependent on the Indian Summer Monsoon rains (ISM). The Bengal Basin or the 'Bengal region' being located at the trajectory of the Bay of Bengal (BoB) branch of the ISM is very sensitive to changes in the ISM strength.
- Even a minor change in ISM strength may have adverse effects on the agrarian-based socioeconomic conditions of the region. However, no systematic long-term record (beyond the range of instrumental period) for the past ISM variability in the region was available.

#### Key Highlights:

- BSIP, an autonomous institute of Department of Science and Technology (DST), for the first time, reconstructed the history of the ISM variability from this region by using both biotic and abiotic proxies that predates instrumental records (records taken before 19th Century).
- In the hydro-climatic history of the last 10.2 ka (10,200 years) of the Bengal region, a team of scientists show that a heavy ISMR was witnessed during 10.2 – 5.6 ka by this region and the ISMR decreased since 4.3 ka.
- The ISM again got strengthened between 3.7 and 2.1 ka following which it switched to a drier mode for some time. The ISM regained its strength during 0.2–0.1 ka. Of the weakened phases, weakening around 4.3 ka was the most severe one, and had adverse impact of the ecosystem.

#### How predictions were made?

- The scientists collected sediment samples from the bed of a dried lake from the northern part of the Bengal Basin and standard techniques were followed for building the age-depth model of sedimentary sequence and measuring different palaeo-climatological parameters.
- They also compared the proxy-based results with a few palaeo-model outputs from the Palaeo Modelling experiments for different time spans to validate the results of this study.
- The numerical models provided insights into the spatio-temporal dimensions of climate change and helped analyse the dynamic relations between different climatic components under specific boundary conditions. Combining these datasets, they investigated the timing, regional coherence and causes of Holocene ISM variability in the Bengal region.
- They explored the drivers influencing the variability of the monsoon in the Indian part of the Bengal Basin and found that while the millennial-scale variations in the ISM rainfall may largely be attributed to changes in solar insolation and dynamics of Inter tropical Convergence Zone, the centennial scale variations may be collectively triggered by phenomena like North Atlantic Oscillation, El Nino Southern Oscillation and Indian Ocean Dipole.

#### Way Forward:

- Focusing on monsoonal variability in the Indian part of the Bengal Basin, the scientists combined both biotic (phytoliths, NPPs and stable carbon isotopes) and abiotic (environmental magnetic parameters, and grain size data) proxy data to understand the ecosystem response to past hydroclimatic changes.
- They inferred that changes in Lake Ecosystem were strongly influenced by the ISM rainfall.

## IPCC WORKING GROUP III REPORT HIGHLIGHTS THE IMPORTANCE OF LIFESTYLE IN CLIMATE DISCOURSE



### Why in news?

- Recently, Dr. Jim Skea, Professor at the Centre for Environment Policy, Imperial College London and currently the Co-chair of Working Group III (WG III) of the Intergovernmental Panel on Climate Change (IPCC) delivered a lecture at Indira Pariyavaran Bhawan, New Delhi.
- The lecture focused on the IPCC Sixth Assessment Report (AR6) with a special emphasis on lifestyle issues.

### Significance of Mission LiFE:

- As an outcome of COP27 at Egypt, the Sharm El-Sheikh Implementation Plan notes the importance of transition to sustainable lifestyles and sustainable patterns of consumption and production to address climate change.
- It also notes the importance of pursuing an approach to education that promotes a shift in lifestyles while fostering patterns of development and sustainability based on care, community and cooperation.
- This is in line with objectives of Mission LiFE launched by Prime Minister Narendra Modi in the presence of UN Secretary General on 20th October, 2022.

### He summarized the findings of the three Working Groups emphasizing the following findings from WG III:

- Global emissions could be reduced by 40%-70% by 2050 while satisfying people's basic needs for nutrition, mobility and shelter while maintaining wellbeing. This could be achieved by demand-side management and lifestyles supported by infrastructure and technology.
- CO<sub>2</sub> emissions account for about 75% of global GHG emissions making it the principal GHG to be tackled by climate change actions.
- Unequal contributions to historic and current emissions where the contribution of entire Southern Asia is only about 4% of historical cumulative net

anthropogenic CO<sub>2</sub> emissions between 1850 and 2019, even though the region includes almost 24% of the global population.

- Remaining budget for limiting warming to 1.5oC is 500 GtCO<sub>2</sub>; the remaining carbon budget for limiting warming to 2oC is 1350 GtCO<sub>2</sub>.
- Carbon Capture and Storage is at the demonstration stage. If brought into use, it would allow the use of fossil fuel to be extended. Unless managed sustainably, bio-energy combined with CCS could also have negative impacts on food security and biodiversity.
- How financial flows fall short of investment needs for mitigation. Gaps are particularly large for developing countries. Also, gaps are much wider for adaptation than for mitigation.
- Investment flows in Southern Asia and Africa are much lower than needed.
- Climate resilient development can protect people from the worse impacts of climate change and align climate change action with the sustainable development goals.
- There are increasing gaps between adaptation actions and what is needed, but there are options we can take to reduce the risks to people and nature. Adaptation gaps are largest among lower income populations.

### Way Forward:

- In the above backdrop, it emerged that IPCC AR6 Synthesis Report, which is on anvil, should incorporate findings from three Working Group Reports in a balanced manner reflecting developing country concerns including historical cumulative emissions, declining carbon budget, adequacy of means of implementation and minimizing the adaptation gap.

## ALIEN PLANTS GROWING TOGETHER THREATENING TIGER HABITATS: STUDY



### Why in news?

- Several alien invasive plants growing together can have a detrimental effect to the biodiversities in tiger habitats, a new study has found.
- The research paper has deciphered many negative impacts of multiple co-occurring alien plants on

biodiversity and what it means for conservation in the era of global changes.

### Background:

- India's biodiverse ecosystems are threatened by a variety of alien plants like Lantana camara, Parthenium hysterophorus, Prosopis juliflora, etc, introduced during British colonisation.
- Due to the absence of reliable scientific data and mixed opinions on the impact of alien species, there exists a dilemma regarding the need to manage them. In the face of rapid, pervasive invasions, this inaction could threaten ecosystems' sustenance.

### Research parameters:

- The study was conducted in Kanha Tiger Reserve, comparing uninvaded native forests with old-growth invasions of single and multiple alien plants.
- The researchers evaluated the differences in soil parameters, native grasses, herbs, shrubs, tree regeneration, habitat use by mammals, herbivory, bird occurrence, etc.

### Key observations:

- Native forests are packed with biodiversity, particularly with rare species and interactions.
- Co-occurring invasive plants like Lantana, Ageratum conyzoides, Pogostemon benghalensis, etc, have a magnified cumulative impact than their individual impacts, causing ecological homogenisation in invaded regions.
- Multiple alien species together affected soil nutrients, which may have depleted the richness of diverse plants. There was hardly any regeneration of important plants like amla or even the most common tree, the sal.
- Native wild herbivores like chital and sambhar did not prefer the commonly found plants in invaded areas. They preferred rare forage plants, which were already depleted in infested areas.
- Reduced forage availability for herbivores like sambar and chital, which are major prey for tiger, leopard, and dhole in this landscape, threaten the sustenance of these carnivores in invaded regions.

### Way Forward:

- Alien plants have invaded majority of natural areas, while invasion management still operates at a truncated scale.
- The study highlighted the importance of investments in scientific restoration in India to mitigate the impacts of biological invasions.

## WHAT LED TO UNUSUALLY LOW TEMPERATURE AT OOTY'S FINGERPOST?

### Context:

- Recently, on a day before Pongal dawned on Udhamandalam, a local temperature gauge

measured a frigid ground temperature of  $-6.3$  degree Celsius in the Fingerpost locality.

- The ground in other parts of Udhamandalam had reached subzero temperatures as well. The lowest ambient temperature in the day was a tolerable  $1.7$  degree Celsius.



### What had caused the mercury to dip so low in Fingerpost?

- The answer is related to the equatorial Pacific Ocean.
- This is a La Niña winter. This means heady winds blow warm water on the sea surface away from the South American mainland, roughly off the coast of Ecuador.
- This heat movement across the Pacific has global consequences. Over India, the La Niña can intensify summer monsoons, bring excess rainfall, and cause colder winters.
- In early 2022, the World Meteorological Organisation said the ongoing La Niña is the first in the 21st century to span three consecutive winters. But in a break from convention, the coldness is deeper in the south. This reveals the second driver.

### La Niña:

- La Niña is the opposite of El Niño, in which equatorial waters off the South American coast become unusually warmer. One effect is that in winter, the subtropical westerly jet over North India is pushed southward, allowing the western disturbance to create cold winters in the north.
- But in La Niña years, there is a 'highway' of chill wind coming southward from the Siberian High, a cold, high-pressure block that is occupying the central Asian region and affecting winds coming into India.

### Anomalously strong:

- The Siberian High is responsible for the bitter-cold of the tundra and has been known to affect the weather from Italy to the Philippines. But this time it is "anomalously strong".
- It's harder to simulate or predict hyperlocal conditions, but by and large, the La Niña winter plus a very strong Siberian High conspired to create a cooler-than-normal winter in South India.

- The temperature further dropped in Tamil Nadu's interior areas, due to the withdrawal of the northeast monsoons from January 12, which allowed the cooler dry-land winds to strengthen.
- Taken together, Udhagamandalam, a hill station, normally has lows of 5-10 degree celsius but on January 14, it experienced a low of 1.7 degree celsius and a ground temperature lower than 0 degree celsius in some parts.

#### Low pressure trough:

- Unlike the El Niño-driven cold air that sweeps India between the southeast and the northwest, in La Niña years the winds mostly tend to come from the north and zip down the pressure trough far into peninsular India.
- So they cover more area and affect more people.

#### Way Forward:

- Scientists expect climate change to affect El Niño and La Niña, but the precise mechanisms are under study.
- Predictions of the seasonal weather over India are further complicated by the temperature of the Indian Ocean, the monsoons, local wind systems, and the fate of the Himalayan glaciers, among others.

### THE DARK SKY IS A NATURAL RESOURCE, AND TOO MUCH LIGHT IS POLLUTING IT



#### Why in news?

- On December 14, 2022, the district administration of Ladakh designated six hamlets within the Changthang Wildlife Sanctuary as a "dark-sky reserve", an area whose sky is free of light pollution.
- The designation meant that the reserve had a responsibility to keep the skies dark, particularly for the astronomical observatories located in the area.

#### Concerns:

- When private space venture company SpaceX's Starlink constellation of small satellites began to obscure the view of ground-based telescopes around the Earth, the idea of the sky as a natural resource capable of being polluted became popular.
- These incidents also rendered the absence of a global treaty to reduce light pollution more conspicuous.
- But while authorities safeguard telescopes' access

to dark skies by actively lowering light pollution around their sites, the night-sky elsewhere is actually becoming brighter due to 'skyglow', which has significant ecological, health and cultural consequences.

#### New study:

- In a new study titled 'Citizen scientists report global rapid reductions in the visibility of stars from 2011 to 2022', researchers from Germany and the U.S. analysed a global database of what the dimmest star visible from a particular location is.

#### Key Findings:

- They found that non-natural light had increased the brightness of the artificial glow of the night sky, or skyglow, by 9.2-10% every year between 2011 and 2022.
- Specifically, the skyglow had brightened around 6.5% over Europe, 10.4% over North America, and 7.7% over the rest of the world.
- The finding is significant because it disagrees with satellite-based data, which has indicated that the rate of increase has been around 2% per year.
- The discrepancy is probably because satellites are unable to 'sense' blue light emitted by LEDs and to study light that is emitted parallel to the ground.
- Visible light emitted by many sources is divergent, so light emitted insufficiently downward could find its way into the sky. Almost all surfaces in cities reflect light, meaning a portion of entirely down-cast light will be reflected upwards, contributing to night-time light pollution.

#### The consequences:

- Regardless of historical or geographical context, humans tend to use as much artificial light as they can buy for about 0.7 percent of GDP. That is, even though LEDs have become more efficient, their utilisation hasn't decreased, which in turn means the carbon emissions due to their production and use hasn't decreased.
- Numerous studies have also found that artificial light at night affects both people and wildlife in significant ways.
- The lit beaches deter sea turtles from coming ashore to nest. Skyglow keeps trees from sensing seasonal variations.
- Young burrow-nesting seabirds don't take flight unless the nesting site becomes dark.
- Clownfish eggs don't hatch when exposed to artificial light at night, killing the offspring.
- Skyglow interferes with multiple aspects of insect life and allows insect predators to hunt for longer.

#### Impact on circadian rhythm:

- Parties to the Convention on Migratory Species adopted guidelines to address the problem at their meeting in Gandhinagar in 2020.

- ⊖ By disrupting the circadian rhythm, artificial light at night can hamper the production of melatonin, an influential hormone in the human body which affects sleep, moods and cognition.
- ⊖ A small 2009 review concluded that circadian disruption increased the risk of breast cancer among night-shift workers by 40%.

**REVIEWS EXPLORE IMPACTS OF AMAZON DEFORESTATION**



**Why in news?**

- ⊖ Researchers emphasize the quick and dramatic changes occurring in the Amazon as a result of growing human activities in two distinct reviews.
- ⊖ They examine what is known about the drivers and consequences of the region's continuous deforestation and landscape degradation, as well as what needs to be done to avoid the worst results.

**Amazon rainforest:**

- ⊖ The Amazon rainforest is one of the most important yet endangered main ecosystems on the planet.
- ⊖ It supports almost one-third of all known species and provides critical global ecosystem services that help regulate the planet's carbon and water cycles.

**Threats:**

- ⊖ However, modern agricultural and industrial activities, as well as broader anthropogenic climate change, are deteriorating Amazonian habitats at an unprecedented rate.
- ⊖ Fluctuating on the brink of irreversible change, continuous forest loss threatens to drive the Amazon above a crucial threshold, with far-reaching consequences for the entire Earth system.

**One Review:**

- ⊖ They summarize key findings from the 2021 Science Panel for the Amazon (SPA) Assessment Report, demonstrating how human activities such as regional deforestation are changing Amazonian ecosystems hundreds to thousands of times faster than any naturally occurring climatic or geological phenomenon has in the past, far too quickly for Amazonian species, peoples, and ecosystems to adapt.

- ⊖ The transformative policy actions are required to prevent these outcomes and reduce the global economy demands that largely drive deforestation

**Second Review:**

- ⊖ They evaluate the proximate and underlying drivers and consequent impacts of Amazon forest degradation.
- ⊖ While most analyses of land use and land-cover change in tropical forests have centred on the causes and effects of deforestation, they focus on other, lesser-studies anthropogenic disturbances, including fire, habitat fragmentation, selective logging, and extreme drought due to human-induced climate change.

**Conclusion & Way Forward:**

- ⊖ Roughly 2.5 million kilometres of the Amazon forest (roughly 38 per cent of all remaining forests in the region) are currently degraded by these impacts.
- ⊖ Carbon emissions from this degradation are equal to, if not greater, than emissions from deforestation and will remain a dominant source of carbon emissions regardless of deforestation rates.
- ⊖ As a result, not only are deforestation policies needed but they must also be complemented with measures to address the disturbances that degrade the Amazon environment.

**RESEARCHERS OFFER TIPS TO SAVE KERALA'S SINKING ISLAND**



**Why in news?**

- ⊖ A study conducted by the National Centre for Earth Science Studies (NCESS) has revealed anthropogenic interventions as the main reason for the plight of Munroe Thuruthu residents, Kerala's first set of climate refugees.

**Details:**

- ⊖ The islanders are facing steady land subsidence, tidal flooding and lower agricultural productivity, all of which have triggered a mass exodus from the region.
- ⊖ The study finds that anthropogenic activities have considerably affected the isostatic conditions and land neutrality of Munroe Thuruthu, resulting in drastic environmental degradation.

**Key Highlights:**

- The multidisciplinary research conducted during the last five years calls for suitable strategies to protect the highly vulnerable estuarine ecosystem and proposes reverse landscaping as an innovative methodology to retrieve the landscape's original geomorphic state.
- According to the study, almost 39% of the land area of the Munroe Thuruthu has been lost with Peringalam and Cheriyakadavu islands recording a land depletion of around 12% and 47% respectively.

**How it degraded over the years?**

- Though the degradation started in 1980s, its severity was felt only in 2000s. Unregulated sand mining and the resultant riverbed pools in the Kallada River have largely contributed for the current degradation.
- After the construction of Thenmala dam, the sediment supply through the river too was blocked.
- While the research team used available remote sensing data and land survey records to analyse the island's morphological changes, electrical resistivity meter surveys were conducted to study the sub-surface geology of the land area.

**Recommendations:**

- Since the Ashtamudi Lake is emerging as an important tourist destination, the study stresses on the need for sustainable management plans to protect the Ramsar-listed wetland.
- The study proposes reverse landscaping, a plan integrating all aspects of earth and social sciences.
- Apart from strict regulatory measures to control sand mining from Ashtamudi Lake and the Kallada river, the current construction methods in the island should be replaced with well-studied engineering techniques.
- An artificial sedimentation process to eradicate the saline banks of deep basins is also suggested as a method and the study recommends to use the sediments deposited in the Thenmala reservoir and those removed through dredging navigation channels for the purpose.

**DOMESTIC GOAT AS A DRUG FACTORY****Context:**

- The domestic goat (*Capra hircus*) is a familiar presence in the rural landscape of India and in many developing countries.
- The goat has played an important economic role in human communities from the time it was domesticated about 10,000 years ago.

**Statistics:**

- The Food and Agriculture Organisation (FAO) estimates that the world has 830 million goats belonging to about 1,000 breeds. India has 150 million from over 20 prominent breeds.

**Breeds in India:**

- Rajasthan has the most number of goats, the Marwari goat found here is hardy and well-adapted to the climate of deserts. Another hardy breed, found in the dry regions of Maharashtra, Telangana and North Karnataka is the Osmanabadi.
- The Malabari (also called Tellicherry) of North Kerala is a prolific breed with low-fat meat, and shares these traits with the beetal goat of Punjab.
- The east Indian Black Bengal goat is a vital contributor to the livelihoods of the rural poor of Bangladesh. It contributes over 20 million square feet of skin and hides to the world's demands for leather goods, from firefighters' gloves to fashionable handbags. As many farmers lack the space or funds to rear cattle, the goat is rightly called "the poor man's cow".
- Indian highlands have scant populations of wild goats, from which domestic goats or sheep have evolved. These include the markhor and the Himalayan and Nilgiri tahr.

**Genetic diversity:**

- Genes from Indian goat breeds spread to all parts of the world during the golden age of steamships. Goats laden on ships heading to Europe from India provided milk and meat on the months-long journey.
- The Jamunapari goats of Uttar Pradesh were favoured as they yield 300 kg of milk during eight months of lactation. Once in England, the Jamunapari was bred with local breeds to produce the Anglo-Nubian, a champion producer of high-fat milk.

**Producing therapeutics:**

- With a generation time of about two years, and plenty of milk production, it is not surprising that goats have attracted the attention of biotechnology companies wishing to produce therapeutic proteins in bulk.

**Antithrombin:**

- The first success came with ATryn, the trade name for a goat-produced antithrombin III molecule.
- Antithrombin keeps the blood free from clots, and its deficiency (usually inherited) can lead to serious complications such as pulmonary embolisms. Affected individuals need antithrombin injections twice a week, usually purified from donated blood.

⇒ Transgenic goats carrying a copy of the human antithrombin gene have cells in their mammary glands that release this protein into milk. It has been claimed that one goat could produce antithrombin equivalent to what was obtained from 90,000 units of human blood.

**Monoclonal antibody cetuximab:**

⇒ Recently, the monoclonal antibody cetuximab, which has been approved by the FDA as an anti-cancer drug against certain lung cancers, has also been produced in cloned goat lines.

⇒ Large quantities can be made this way (10 grams per litre of milk). It is not yet known whether this 'Farmaceutical' will clear regulatory hurdles regarding safety and efficacy.

**SCIENCE & TECH**

**MOU SIGNED FOR COMMERCIAL PRODUCTION OF INDIGENOUSLY DEVELOPED VACCINE "LUMPI-PROVAC"**

**Why in news?**

⇒ An MoU for production of Goat Pox vaccine and "Lumpi-ProVac" vaccine was signed recently.



⇒ This MoU will ensure large-scale production of Goat Pox vaccine for future needs of India's livestock sector.

⇒ At present Goat Pox vaccine is used for controlling Lumpy Skin Disease in animals and this has been proven effective against Lumpy.

**Details:**

⇒ National Centre for Veterinary Type Culture, ICAR-National Research Centre on Equines (ICAR-NRCE), Hisar (Haryana), in collaboration with ICAR-Indian Veterinary Research Institute (IVRI), Izatnagar (UP) developed a homologous live-attenuated LSD vaccine, named Lumpi-ProVacInd.

⇒ Agrinnovate India Limited (AgIn), the commercial arm of DARE, Ministry of Agriculture and Farmers' Welfare, Govt. of India granted "Non-Exclusive Rights" for Commercial production of "Lumpi-ProVac", to Institute of Veterinary Biological Products (IVBP), Pune.

**Lumpi-ProVacind:**

⇒ Lumpi-ProVacind is safe in animals and induces LSDV-specific antibody-and cell-mediated immune response, besides providing complete protection against lethal LSDV challenge.

⇒ Lumpi-ProVacind is used for the prophylactic immunization of animals against Lumpy Skin Disease, which illicit protection for about one year.

⇒ A single dose of the vaccine contains 103.5 TCID50 of live-attenuated LSDV (Ranchi strain). The vaccine is stored at 4°C.

⇒ The vaccine must be shipped on ice and must be used within a few hours after reconstitution. The patent has been filed by the ICAR for the technology.

**Background:**

⇒ The Lumpy Skin Disease has been reported in India from 2019 while first case was reported in the state of Odisha. After that, it has spread to multiple states in the country.

⇒ In 2019, death of a large number of cattle has been reported from different states with high morbidity especially in North-West region of the country.

⇒ The disease has been controlled and contained with the available Goatpox vaccine in the country.

⇒ Considering the heavy production losses and mortality of sizable number of cattle, ICAR initiated research on development of indigenous homologous vaccine against Lumpy Skin Disease.

**WHAT IS THE CRYPTO AWARENESS CAMPAIGN?**



**Why in news?**

⇒ The Investor Education and Protection Fund (IEPF) will launch an outreach programme soon to create awareness of cryptocurrencies and online gaming.

⇒ The need for the outreach is based on the observation that both crypto-assets and online gaming (that extends to gambling and betting) are still being promoted in a risky manner despite the recent turmoil in the sector.

**What is the Investor Education and Protection Fund (IEPF)?**

⇒ The Investor Education and Protection Fund (IEPF)

is managed by the IEPF Authority, which was set up in 2016 under the provisions of Section 125 of the Companies Act, 2013.

- The Authority is entrusted with the responsibility of administration of the IEPF, which, besides promoting awareness among investors, makes refunds of shares, unclaimed dividends, matured deposits and debentures and so on to rightful claimants.
- As for investment education, the idea is to reach out to household investors, housewives and professionals alike in rural and urban areas and teach them the basics.
- Focus areas include primary and secondary capital markets, various saving instruments, the instruments for investment (such as mutual funds, equity, among others), making investors aware of dubious Ponzi and chit fund schemes and existing grievance redressal mechanisms, among other things. Until the end of October, it had conducted more than 65,000 awareness programmes covering 30 lakh citizens.

#### Why is there a concern about cryptocurrency?

- The crypto dilemma stems from concerns about the unregulated currency having a destabilising effect on the monetary and fiscal stability of a country.
- Further, crypto exchanges in India are being investigated for their alleged involvement in unlawful practices such as drug trafficking, money laundering, violating foreign exchange legislation and evasion of GST.
- The Reserve Bank of India (RBI) has recommended framing legislation on the sector. It is of the view that cryptocurrencies should be prohibited.
- The crypto assets are by definition borderless and therefore, any legislation (for regulation or for banning) would require international collaboration to prevent regulatory arbitrage. The collaboration must entail an evaluation of risks and benefits and evolution of common taxonomy and standards.

#### Will an outreach programme help?

- There are two concerns: first, apart from the outreach programme, there has to be a regulatory mechanism for the crypto sector. Second, he says the messaging has to be right.
- Cryptocurrency investing can be a complex and risky endeavour as the category is extremely volatile and works round the clock. It is important for potential investors to thoroughly educate themselves before making any decision.
- As for the allegations, the immutable, public nature of the blockchain makes crypto a poor choice for money laundering because it allows law enforcement to uncover and trace money laundering far easier than cash transactions.

#### What about online gaming?

- The Ministry of Electronics and Information Technology (MeitY) has been appointed the nodal

industry for online gaming in India; for e-sports, the nodal agency is the Department of Sports, under the Ministry of Youth Affairs and Sports. A proposed framework for Central regulation by MeitY is expected to address issues faced by the sector.

- For instance, there is confusion about the definitions of a 'game of chance' like fantasy games, and a 'game of skill', a term, which has been used in the Public Gaming Act (1867) but has not been spelt out. There are risks from cybercrimes as well.
- In a 'game of skill', while the element of chance cannot be entirely ruled out, it is the 'element of skill' (mental or physical skill of the user) that plays a dominant role in determining the outcome of the game rather than pure chance.
- A glance at the rulings of the Supreme Court and several High Courts clearly establish 'Games of Skill' as legitimate business activities protected under Article 19(1)(g) of the Indian Constitution. These rulings have also emphasised a clear distinction between 'Games of Skill' and 'Games of Chance'.
- Despite these court rulings, online skill games have faced restrictions in a few States due to addiction, financial losses and the thin line between skill and chance.

### POTENTIAL CLIMATE CHANGE-NUTRITION CONNECTION IN PLANT METABOLISM UNCOVERED BY RESEARCHERS



#### Why in news?

- A new study from researchers at Michigan State University underscores that there's still much to learn regarding how plants will function, and how nutritious they will be, as more carbon enters atmosphere.
- That same influx of carbon is helping drive climate change, meaning this new work, may be revealing an unexpected way this global phenomenon is reshaping nature and our lives.

#### Key Highlights:

- Although elevated levels of carbon dioxide can be good for photosynthesis, it showed that increasing CO<sub>2</sub> levels can tinker with other metabolic processes

in plants. And these lesser-known processes could have implications for other functions like protein production.

- The new research brings up surprising questions about how plants will make and metabolize amino acids with more carbon dioxide around.

### Photorespiration:

- The basics of photosynthesis are famously straightforward: Plants take water and carbon dioxide from their surroundings and, with power from the sun's light, turn those ingredients into sugar and oxygen.
- But sometimes this process starts off on the wrong foot. The enzyme responsible for collecting carbon dioxide can instead grab onto oxygen molecules.
- This produces a byproduct that, left unchecked, would essentially choke out the plant. However, plants have evolved a process called photorespiration that clears out the harmful byproduct and lets the enzyme take another swing at photosynthesis.
- Photorespiration is not nearly as famous as photosynthesis, and it sometimes gets a bad rap because it takes up carbon and energy that could be used for making food. Inefficient though it may be, photorespiration is better than the alternative.
- To do its job, photorespiration incorporates carbon into other molecules or metabolites, some of which are amino acids, the precursors to proteins.

### Metabolic sleuthing:

- When it comes to where amino acids produced by photorespiration end up, one established theory was that they remained in a closed loop. That means that metabolites made in the process are constrained to a select group of organelles and biochemical processes.
- Now, the researchers have shown that's not always the case. In particular, they've shown that the amino acids glycine and serine are able to escape the confines of that closed loop.
- What ultimately becomes of the compounds is a lingering question and one that could become increasingly important as carbon dioxide levels rise.
- Plants photorespire less when more carbon dioxide is available, so scientists will need to probe deeper into how plants produce and use these amino acids overall.

### Background:

- For the time being, though, he and his team are excited they've reached this finding, which was no trivial feat.
- It involved feeding the plants a special type of carbon dioxide in which the carbon atoms had one more neutron than the carbon typically found in the atmosphere.
- A neutron is a subatomic particle and, as such, it has a very small mass.

- But the MSU collaboration had the tools and expertise needed to measure that subtle difference in mass. Those measurements, coupled with computational modeling, enabled the researchers to follow that slightly beefy carbon and see how plants integrate it at different metabolic stages when conditions favor photorespiration.

### Significance:

- This new technique enabled a better and more quantitative understanding of important metabolic pathways in plants.

## PM MODI OUTLINES VISION OF SCIENCE AT 108TH INDIAN SCIENCE CONGRESS



### Why in news?

- Recently, the Prime Minister of India inaugurated the 108th Indian Science Congress (ISC) being held in Nagpur via video conferencing.
- It was inaugurated at the Rashtrasant Tukdoji Maharaj Nagpur University
- The theme of 108th ISC is "Science and Technology for Sustainable Development with Women Empowerment".

### Key Highlights of PM's address:

- The Prime Minister of India outlined the vision for science for the next 25 years, urging researchers to make the country self-reliant and focus on converting their knowledge to bring about change in everyday life.
- He also stressed on strengthening scientific processes, focus on emerging areas such as quantum technologies, data sciences, development of new vaccines, stepping up efforts on surveillance for newer diseases and encouraging youngsters to take up research.
- He made a strong pitch for creating an institutional framework and a mentor-mentee (guru-shishya) system that could build upon the successes of talent hunts and hackathons to attract youngsters to science.
- He also highlighted the opportunities for private companies and startups by associating with research labs and academic institutions. He urged researchers

to focus on quantum computing and emerge as world leaders in the upcoming field.

### India's GII:

- Since India is home to 17 to 18 per cent of the world's population, progress of such a large number of people will lead to a surge in global advancement as well
- India is using scientific means for progress and its consequences are visible, noting that India jumped to 40th in the global innovation index from 81 in 2015 in a list of 130 countries.

### Background:

- The first session of the Indian Science Congress was held in 1914 at the premises of the Asiatic Society, Calcutta.
- The event is organized by the Indian Science Congress Association (ISCA).
- ISCA is an independent body functioning with the support of the Department of Science and Technology (DST) in the central government.
- Dubbed as the largest gathering of scientists and students in the country, the Science Congress is an annual five-day event from January 3 to 7.

## WORLD'S FIRST VACCINE FOR HONEYBEES GETS CONDITIONAL NOD IN US



### Why in news?

- The United States Department of Agriculture (USDA) has granted a conditional license for a vaccine for honeybees to curb American foulbrood (AFB), a fatal bacterial disease for the insect.

### American foulbrood (AFB):

- AFB is caused by the spore-forming bacterium *Paenibacillus larvae*. Infected broods usually die at the pre-pupal or pupal stage.
- It is not a stress-related disease and can infect the strongest to the weakest colony in an apiary. Heavy infections can affect most of the brood, severely weakening the colony and eventually killing it.
- The disease cannot be cured, meaning that the destruction of infected colonies and hives or irradiation of infected material is the only way to manage AFB.

- The bacteria *Melissococcus plutonius* causes another similar disease, European foulbrood. However, the incidence of EFB is generally higher when the colony is under stress.

### Vaccine:

- The first such vaccine, developed by biotechnology company Dalan Animal Health, gives hope of a new weapon against diseases that routinely ravage colonies relied upon for food pollination.
- The vaccine technology exposes queen bees to inactive (ie, "dead") bacteria, which enables the larvae hatched in the hive to resist infection.

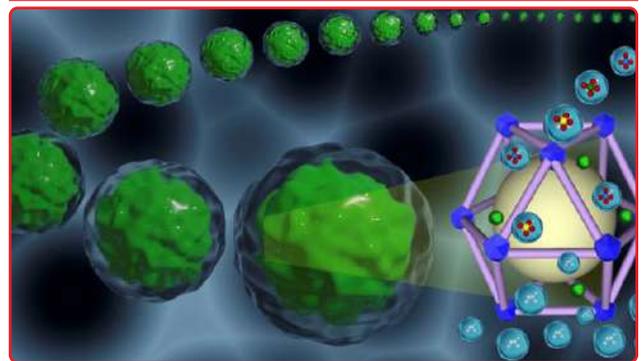
### How it works?

- The vaccine is mixed in queen candy – the primary food source for both the queen bees and the attendant bees living in cages.
- Worker bees consume the vaccine with the queen candy, which is then digested and transferred to the glands that produce the royal jelly. Worker bees then feed the royal jelly containing the vaccine to the queen bee.
- The queen digests the royal jelly and the vaccine is transferred to her ovaries. She is then released into the hive. The vaccine gets transferred to the developing eggs. The developing larvae get vaccinated and are more immune to infection as they hatch.
- The immune priming showed no negative impact on queen fitness in tests, the company claimed. Tests also showed no negative impact on honey.

### Honeybee population:

- Honeybee populations are declining sharply, spurred by habitat loss, pesticide use and the climate crisis.
- Fewer honeybees mean not just less honey but also less food, honeybees are critical to pollinating up to 95 crops in the US.

## IISER PUNE'S NEW MATERIAL REMOVES POLLUTANTS FROM WATER



### Why in news?

- Access to clean and drinkable water has now not only become a local problem but global as well. Water contamination is one of the world's leading causes of death and the problem is only getting worse.

➤ To tackle this, Indian Institute of Science Education and Research (IISER), Pune came up with a custom-designed unique molecular sponge-like material, which can swiftly clean polluted water by soaking up sinister contaminants.

### Carcinogenic pollutants:

- Systematic studies have identified various organic (organic dyes, antibiotics, pesticides, etc.) as well as inorganic toxic pollutants such as iodides, oxo-pollutants like perhenate that are carcinogenic in fresh water sources and can pose direct threat to humanity and living organisms.
- In general, commonly utilised sorbent materials often trap these pollutants through ion-exchange strategy to purify water but suffer from poor kinetics and specificity.
- To mitigate this issue, they prepared a newly engineered material called viologen-unit grafted organic-framework (iVOFm).

### iVOFm:

- The material employs amalgamation of electrostatics driven ion-exchange combined with nanometer-sized macropores and specific binding sites for the targeted pollutants.
- The size and number of tunable macropores along with the strong electrostatic interaction of iVOFm can quickly remove various toxic pollutants from water.
- To develop this unique material, our team employed a make-and-break strategy to grow a charged porous organic polymer (POP) as a sponge-like infinite framework on silica nanoparticles that is used as a template.
- Following this, the silica nanoparticles were strategically removed to create ordered hierarchical interconnected macro/microporosity throughout the material.

### Characteristics:

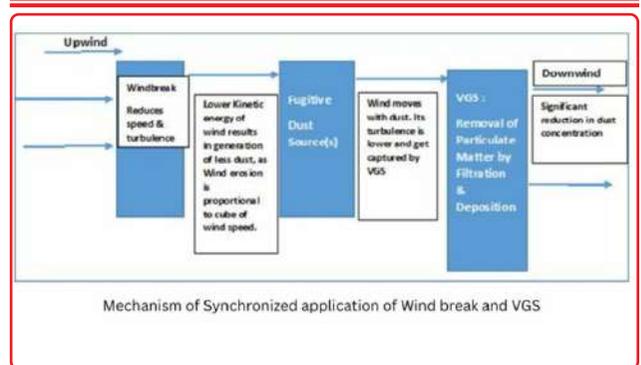
- This material features inherent cationic nature and macroporosity to allow fast diffusion of pollutants. When tested for a wide array of water pollutants, it showed ultrafast capture of all the pollutants, both organic and inorganic with over 93% removal in just 30 seconds.
- Among all the tested pollutants, the new material showed ultrafast removal of sulfadimethoxine antibiotic from water almost completely.
- Even in the presence of other co-existing anions such as nitrates, chloride, and bromide, the removal of sulfadimethoxine antibiotic was extremely high within a minute. The engineered material could remove sulfadimethoxine antibiotic with high efficiency when tested using different real water samples.
- The fast pollutant trapping capacity is attributed to faster diffusion of pollutants through the ordered

interconnected presence of macropores in the material. It can also be used several times to clean contaminated water just like a bath sponge can be utilised to tackle multiple water spills.

### Way Forward:

- This cationic compound is adaptable for sequestering various pollutants and is a possible solution to the water pollution problem. These results open up a new avenue for the creation of numerous sophisticated sorbent materials for practical water filtration.

## CMPDIL INVENTS NEW DUST CONTROL TECHNOLOGY



### Why in news?

- In order to minimize and control the fugitive dust in mining areas, Central Mine Planning and Design Institute Limited (CMPDIL), Ranchi (a consultancy subsidiary of Coal India Limited) has invented a "System and Method for Controlling Generation and Movement of Fugitive Dust".

### Applications:

- This system can be used in mines, thermal power plants, railway sidings, ports, construction sites wherein coal or other minerals/fugitive materials are stored under open sky.
- Apart from reducing the dust generation from open sources, it will also provide noise attenuation.

### Fugitive dust:

- Coal/Lignite PSUs under the Ministry of Coal consistently strive to produce quality coal in an environmentally responsible manner to meet the country's energy needs.
- To prevent or mitigate air pollution caused by coal mining and allied activities, coal/lignite PSUs are adopting various measure.
- Fugitive dust is a form of particulate matter that contributes to air pollution that is generated from various sources which are exposed to air and not discharged into the atmosphere through a confined flow stream. Working mechanism:
- The present invention relates to the synchronized application of windbreak (WB) and vertical greenery system (VGS) for reducing generation and dispersion

of fugitive dust. The WB and VGS are erected in the upwind and downwind direction with respect to the fugitive dust source(s) respectively.

- The WB reduces the speed of the wind approaching towards the source and hence, it reduces the intensity of the ambient air to pick up dust while blowing over the source.
- The VGS acts as a filter and reduces the quantity of the residual dust moving along with the wind towards the receptors in the down-wind direction. Therefore, there is a significant reduction in the concentration of the dust in the ambient air at various receptors located in the down-wind direction.

### SWEDEN INAUGURATES NEW SATELLITE LAUNCH SITE



#### Why in news?

- Just days after a failed UK satellite launch, Sweden inaugurated new launching site as the race heats up to be the first country to send satellites into orbit from the European continent.
- The "Spaceport Esrange", has been described as "mainland Europe's first satellite launch complex".

#### Key Highlights:

- The site is an extension of the Esrange Space Centre in Sweden's Arctic, around 40 kilometres (25 miles) from the town of Kiruna.
- Around 15 million euros (\$16.3 million) have been invested in the site, which is expected to serve as a complement to Europe's space hub at Kourou in French Guiana.
- It will also provide launch capabilities at a time when cooperation with Russia and the Baikonur launch site in Kazakhstan has been curtailed by the war in Ukraine.

#### Other European spaceports in the race:

- Projects in Portugal's Azores archipelago, Norway's Andoya island, Spain's Andalusia and Britain, among others, are all vying to be the first to succeed.
- Rocket Factory Augsburg (RFA), a German specialist in smaller launchers that are increasingly used by countries and firms sending more compact satellites into space, said recently its first launch would take

place at SaxaVord in the Shetland Islands at the end of 2023.

- The satellite industry is booming, with the number of satellites in operation in 2040 expected to reach 100,000, the SSC said, compared to 5,000 now.

#### Way Forward:

- Esrange's state-owned operator, the Swedish Space Corporation (SSC), aims to launch its first satellite from the site "in the first quarter of 2024".
- That would make Sweden the first country in continental Europe excluding Russia to send up a satellite from its soil.
- With a reusable rocket project called Themis, Esrange will also host the European Space Agency's tests of rockets able to land back on Earth, similar to those used by SpaceX, one of the company's owned by the billionaire Elon Musk.

### RECONSTRUCTING PAST DEEP-WATER CIRCULATIONS OF INDIAN OCEAN



#### Context:

- Global overturning circulation, the equatorward transport of cold, deep waters and the poleward transport of warm, near-surface waters controls ocean heat distribution and atmospheric carbon dioxide levels, thus playing a critical role in global climate.
- It is thought that tectonic changes might have led to the formation of two separate water bodies; northern component water in the North Atlantic and Antarctic Bottom Water (AABW) in the Southern Ocean.
- But these formulations have remained untested due to lack of adequate data. Some records that are available are from near the deep-water formation regions mostly from the Pacific and the Atlantic Oceans. Hence, they might not necessarily reflect the impact and change in deep water circulation.

#### Earlier studies:

- Few studies have been carried out in the Indian Ocean to reconstruct past deep water circulations based on iron-manganese crust records and authigenic neodymium isotope composition of sediment cores.
- But iron-manganese crusts are situated at deeper depths and are bathed only by AABW, making it

suitable only for the reconstruction of the history of AABW, and authigenic neodymium isotope records are available only from the Bay of Bengal region.

**Recent study:**

- A new study by a team of researchers from the Goa-based National Centre for Polar and Ocean Research and the School of Earth, Ocean and Atmospheric Sciences in Goa University has now sorted out the issue.
- The scientists have generated an authigenic neodymium isotope record from the Arabian Sea and reconstructed the DWC record of the Indian Ocean for the period from 11.3 million years ago (Miocene era) to 1.98 million years ago (Pleistocene era).

**Observations made:**

- The record shows a clear shift from the Pacific water dominated deep circulation system before about nine million years ago, to the onset of a modern-like deep water circulation system in the Indian Ocean comprising of Antarctic bottom water and northern component water during the Miocene-Pliocene transition (about six million years ago).
- The finding suggests a widespread impact of the late Miocene Central American Seaway closure on the evolution of ocean deep water circulation and validates the so-called Panama Closure Hypothesis.

**INDIA TO BE FULLY COVERED BY  
DOPPLER RADAR NETWORK TO PREDICT  
EXTREME WEATHER EVENTS**



**Why in news?**

- Recently, the Science & Technology Minister has said that the entire stretch of India will be covered under the Doppler Weather Radar Network to better predict extreme weather events more accurately. The complete coverage is expected to be achieved by 2025.

**Key Highlights of 148th Foundation Day of the IMD:**

- Speaking at the 148th Foundation Day of the India Meteorological Department (IMD), he said that steps have been taken to increase the radar network from a mere 15 in 2013 to 37 in 2023, and work is underway to add another 25 more in the next two to three years.

- The IMD has augmented the Doppler Weather Radar network in Himachal Pradesh, Uttarakhand, Ladakh, and Jammu & Kashmir, which will help further predict extreme weather events more accurately. During the event, he dedicated 4 Doppler Weather Radar Systems to the Western Himalayan States of Jammu and Kashmir, Uttarakhand, and Himachal Pradesh.
- He also dedicated 200 agro-automated weather stations to the nation. Under the Agro-Meteorological Services, the center is planning to establish 660 District Agro Meteorological Units (DAMUs) by 2025 and increase the coverage from 3,100 blocks in 2023 to 7,000 blocks in 2025.

**Contribution of IMD:**

- Climate Services are very important for short and long-term planning and strategic development and IMD has already initiated these services in five major thrust areas of Agriculture, Health, Water, Energy, and Disaster Risk Reduction and has lined up plans to expand them through customization of products.
- IMD's accuracy has increased by about 20-40% for different severe weather events forecast during the last five years and that the weather department is making the best use of space-based observations of INSAT-3D and 3DR, OceanSat satellites for prediction of other weather events.
- The recently introduced Flash Flood Guidance in 2021 has been augmented further by increasing the number of watersheds from 30,000 to 1,00,000 in the country in 2022. It is being provided every six hours to Nepal, Bhutan, Bangladesh, and Sri Lanka apart from our national use.

**JAMES WEBB TELESCOPE DISCOVERS  
ITS FIRST EARTH-SIZED EXOPLANET**



**Why in news?**

- Recently, the National Aeronautics and Space Administration (NASA) announced that the James Webb Space Telescope has discovered its first new exoplanet.
- Researchers have labelled the planet as LHS 475 b, and it's roughly the same size as Earth.

**Details:**

- Located just 41 light-years away, the planet orbits very close to a red dwarf star and completes a full orbit in just two days.
- Researchers hope that in the coming years, they will be able to detect more Earth-sized planets. So far, most of the discovered exoplanets are similar to Jupiter as Earth-sized planets are much smaller in size and harder to discover with older telescopes.

**What are exoplanets?**

- Exoplanets are planets that orbit other stars and are beyond our solar system.
- According to NASA, to date, more than 5,000 exoplanets have been discovered. Scientists believe that there are more planets than stars as each star has at least one planet orbiting it.
- Exoplanets come in a host of different sizes. They can be gas giants bigger than Jupiter or as small and rocky as Earth.
- They are also known to have different kinds of temperatures, boiling hot to freezing cold.

**Why and how they are studied?**

- Studying exoplanets not only broadens understanding of other solar systems but also helps piece together information about our own planetary system and origin.
- However, the most compelling reason to learn about them is to find extraterrestrial life.

**Characteristics of an exoplanet:**

- In a bid to understand the characteristics of an exoplanet, researchers look for its mass and diameter along with determining if it is solid or gaseous or even has water vapour in the atmosphere.
- Another important element of the study is finding out the distance between an exoplanet and its host star. This helps scientists determine if a discovered world is habitable or not.
- If an exoplanet is too close to the star, it might be too hot to sustain liquid water. If it's too far, it might only have frozen water. When a planet is at a distance that enables it to have liquid water, it is said to be in the "Goldilocks zone".
- With the launch of the Webb telescope, scientists believe that they would now be able to better study exoplanets as it is the only telescope that is capable of characterising the atmospheres of Earth-sized planets orbiting distant stars.

**How are exoplanets discovered?**

- Discovering exoplanets is quite tough as they are small and hard to spot around their bright host stars.
- Scientists rely on indirect methods, such as the transit method, which is "measuring the dimming of a star that happens to have a planet pass in front of it".

**What are red dwarf stars?**

- The newly discovered exoplanet orbits around a red

dwarf star. Such types of stars are the most common and smallest in the universe. As they don't radiate much light, it's very tough to detect them with the naked eye from Earth.

- However, as red dwarfs are dimmer than other stars, it is easier to find exoplanets that surround them. Therefore, red dwarfs are a popular target for planet hunting.

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**BEYOND BEN FRANKLIN, SCIENTISTS CHANGE THE PATH OF LIGHTENING USING LASERS**


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**Why in news?**

- Researchers recently succeeded in using a laser aimed at the sky from atop Mount Santis in northeastern Switzerland to divert lightning strikes.

**Background:**

- It was Benjamin Franklin who first demonstrated the connection between lightning and electricity in 1752, and his work remains the guiding principle when it comes to taming electricity.
- Lightning is a high-voltage electrical discharge between a cloud and the ground, within a cloud, or between clouds.

**Recent research:**

- Researchers at the Ecole Polytechnique's Laboratory of Applied Optics in France are trying to improve on the experiment by designing a system employing a high-powered laser that may revolutionise lightning protection.
- They successfully diverted lightning strikes by using a laser aimed at the sky from atop Mount Santis in northeastern Switzerland.

**How experiment was conducted?**

- The laser device is the size of a large car and weighs more than 3 tons. It uses lasers from the German industrial machine manufacturing company Trumpf Group.
- The system was placed on the mountaintop at an altitude of about 2,500 meters and was focused on the sky above a 400-foot-tall transmission tower belonging to telecommunications provider Swisscom.
- Scientists fired intense laser pulses about 1,000 times per second to redirect the lightning strikes. In the

first instance, the researchers used two high-speed cameras to record the redirection of the lightning's path by more than 160 feet (50 meters). Three others were documented with different data.

### Lightning rods:

- When very high-power laser pulses are emitted into the atmosphere, filaments of very intense light form inside the beam. These filaments ionise the nitrogen and oxygen molecules in the air, which then release electrons that are free to move. This ionised air, called plasma, becomes an electrical conductor.
- This concept, first proposed in the 1970s, has worked in laboratory conditions, but until now not in the field.
- Lightning rods, dating back to Franklin's time, are metal rods atop buildings, connected to the ground with a wire, that conduct electric charges that lightning strikes harmlessly into the ground. Their limitations include protecting only a small area.

### Way Forward:

- Further research and development into the system could safeguard critical infrastructure including power stations, airports, wind farms, and launchpads.
- Lightning inflicts billions of dollars in damage on buildings, communication systems, power lines, and electrical equipment annually while also killing thousands of people.

## RARE DINOSAUR EGGS FOUND IN NARMADA VALLEY SHOW HOW ANCIENT REPTILES SHARED TRAITS WITH TODAY'S BIRDS: STUDY



### Why in news?

- A group of Indian researchers found rare cases of fossilised dinosaur eggs, an egg within an egg among 256 newly discovered eggs from the Narmada Valley.

### Key Highlights:

- The discovery suggests that Titanosaurs, one of the largest dinosaurs to have roamed the Earth, displayed a notable reproductive trait unique to modern-day birds.
- The unique feature of egg within the egg has not been reported from any other dinosaur or even in other reptiles.

- The egg has two yolks; this feature can be seen in birds, suggesting they share similar reproductive traits.

### Details:

- They discovered 92 nesting sites containing 265 fossilised eggs, measuring 15-17 centimetres in diameter during field investigations in the Dhar district of Madhya Pradesh between 2017 and 2020.
- This region falls between the easternmost Lameta exposures at Jabalpur in the upper Narmada Valley (central India) and Balasinor in the west in the lower Narmada Valley (western central India), according to the document.
- Lameta exposure is a sedimentary rock formation known for its dinosaur fossils. The fossil records here are largely concealed by Deccan volcanic flows, which prevents their removal by erosion.

### Unique features:

- The eggs belonged to six species, suggesting a higher diversity of these extinct giants in India. Further, Titanosaurs buried their eggs in shallow pits, a behaviour seen in modern-day crocodiles.
- They nested in colonies, a feature found in about 13 per cent of modern-day birds. They also laid eggs in sequential order like avian species.
- Parental care was likely absent as the eggs were laid too close to each other. The spacing did not provide room for adults, suggesting that hatchlings were forced to fend for themselves.

### Impact of "egg-in-egg feature":

- The "egg-in-egg feature" did not benefit the dinosaurs. The pore canals get blocked due to the presence of two eggshell layers, one above the other. This could asphyxiate the embryo.
- Among the fossils, they also found unhatched eggs. Infertility, embryo death before hatching and deep burial could have contributed to their death. Environmental factors such as floods could also be involved.
- Fossilised eggs provide clues on reproductive biology, nesting behaviour and parental care.

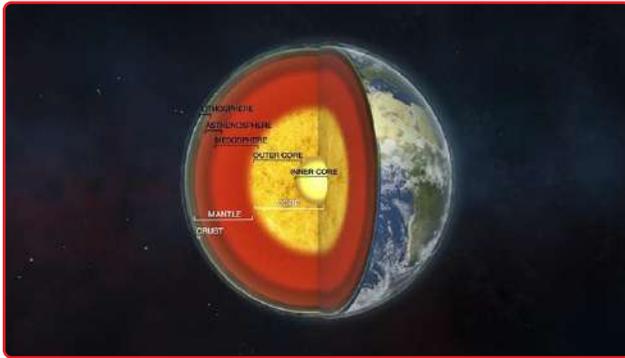
### What's next?

- They hopes to study fossil bone and teeth specimens from the Lameta Formation of Narmada Valley.
- They also plan to scan the eggs to search for embryo or juvenile fossil specimens.

## EARTH'S CORE HAS STOPPED SPINNING AND MAY BE CHANGING DIRECTION. WHAT HAPPENS NOW?

### Why in news?

- A new study has now revealed that the Earth's inner core recently stopped spinning and then changed its spin orientation in the opposite direction.



- ⇒ The study states that the globally consistent pattern suggests that inner-core rotation has recently paused.
- ⇒ The rotation came to a grinding halt in 2009 and then it surprisingly turned in an opposite direction.

### Cycle of Swing:

- ⇒ Researchers have long believed that the inner core rotates, relative to the Earth's surface, back and forth, like a swing.
- ⇒ One cycle of the swing is about seven decades, meaning it changes direction roughly every 35 years. It previously changed direction in the early 1970s, and predicted the next about-face would be in the mid-2040s.

### What is Earth's Inner Core?

- ⇒ Earth's layers are divided into three parts: the crust, mantle, and core.
- ⇒ Earth's inner core was first discovered in 1936 as researchers were studying seismic waves from earthquakes that travel throughout the planet.
- ⇒ It was the change in the waves that revealed Earth's core, which is around 7000 kilometers wide and made up of a solid center of iron wrapped inside the shell of liquid iron.

### Variation:

- ⇒ A 1996 study revealed that the travel times of seismic waves that traverse the Earth's inner core show a small but systematic variation over the past three decades.
- ⇒ This variation is best explained by a rotation of the inner core and the rotation rate is on the order of 1° per year faster than the daily rotation of the mantle and crust.
- ⇒ The team analysed earthquakes mostly from between 1995 and 2021 and the analysis revealed that sometime around 2009 the core stopped spinning and might be in the process of changing the spinning direction.

### What happens now?

- ⇒ Researchers have said that the rotation of the core is related to the changes in the length of the day and it could lead to small variations in the exact time it takes for Earth to rotate on its axis and that there are links between the different layers of the planet -crust, mantle, and core.

- ⇒ The observations provide evidence for dynamic interactions between the Earth's layers, from the deepest interior to the surface, potentially due to gravitational coupling and the exchange of angular momentum from the core and mantle to the surface.

### Way Forward:

- ⇒ So far there is no evidence to suggest that the change in the spinning could affect people living on the surface of the planet.
- ⇒ The study can motivate some researchers to build and test models which treat the whole Earth as an integrated dynamic system.

## ORIGIN OF EARTH'S VOLATILE CHEMICALS LIKED TO METEORITES: RESEARCH



### Why in news?

- ⇒ By analysing meteorites, researchers from the Imperial College of London have uncovered the likely far-flung origin of Earth's volatile chemicals, some of which form the building blocks of life.

### Details:

- ⇒ They found that around half the Earth's inventory of the volatile element zinc came from asteroids originating in the outer Solar System, the part beyond the asteroid belt that includes the planets Jupiter, Saturn, and Uranus.
- ⇒ This material is also expected to have supplied other important volatiles such as water.

### Volatiles:

- ⇒ Volatiles are elements or compounds that change from solid or liquid state into vapour at relatively low temperatures.
- ⇒ They include the six most common elements found in living organisms, as well as water. As such, the addition of this material will have been important for the emergence of life on Earth.

### Background:

- ⇒ Previous research suggested that the Earth formed almost exclusively from inner Solar System material, which researchers inferred was the predominant source of Earth's volatile chemicals.
- ⇒ In contrast, the new findings suggest the outer Solar System played a bigger role than previously thought.

### How the study was conducted?

- To carry out the study, the researchers examined 18 meteorites of varying origins – eleven from the inner Solar System, known as non-carbonaceous meteorites, and seven from the outer Solar System, known as carbonaceous meteorites.
- For each meteorite they measured the relative abundances of the five different forms or isotopes of zinc. They then compared each isotopic fingerprint with Earth samples to estimate how much each of these materials contributed to the Earth's zinc inventory.
- The results suggest that while the Earth only incorporated about ten per cent of its mass from carbonaceous bodies, this material supplied about half of Earth's zinc.
- The material with a high concentration of zinc and other volatile constituents is also likely to be relatively abundant in water, giving clues about the origin of Earth's water.

### Contribution:

- The findings reveal important clues about how Earth came to harbour the special conditions needed to sustain life.

## ISRO TO TEST LANDING OF ITS REUSABLE LAUNCH VEHICLE



### Why in news?

- The Indian Space Research Organisation (ISRO) is set to conduct the maiden landing demonstration of the Reusable Launch Vehicle (RLV), which is in its technology demonstration phase.
- The spacecraft resembles NASA's space shuttles that acted as the US space agency's biggest transporter into Low Earth Orbit (LEO).

### What is ISRO's RLV?

- RLV is ISRO's attempt at developing essential technologies for a fully reusable launch vehicle to enable low-cost access to space.
- ISRO has established itself as a cost-effective launch service provider in the billion-dollar satellite launch market and the new system will further strengthen its position.

### Configuration:

- The RLV's configuration is the same as that of an aircraft and combines the complexity of both launch vehicles and aircraft.
- The winged RLV-TD has been configured to act as a flying test bed to evaluate various technologies, namely, hypersonic flight, autonomous landing, and powered cruise flight.
- The system consists of a fuselage (body), a nose cap, double delta wings, and twin vertical tails along with symmetrically placed active control surfaces called Elevons and Rudder.
- A conventional solid booster (HS9) designed for a low burn rate pushes the system to a speed of Mach 5 (five times the speed of sound.)

### Why is ISRO building Reusable Launch Vehicle?

- The key objective behind developing the reusable system is to stand firm in the launch market, which today is dominated by SpaceX, thanks to its reusable Falcon-9 rockets.
- The Elon Musk-led company conducted 61 successful launches on the back of its reusable system in 2022 and plans to boost those numbers to 100 in 2023. ISRO is targeting this market and a reusable launch vehicle will take it far.
- The main objective behind the system is to develop a hypersonic aero thermodynamic characterization of the wing body, evaluate autonomous navigation, guidance and control schemes, integrated flight management, and thermal protection system evaluation.
- ISRO successfully conducted a flight test of the RLV-RD in 2016 from Sriharikota, which validated the critical technologies such as autonomous navigation, guidance & control, reusable thermal protection system, and re-entry mission management.

### What happens during landing demonstration?

- As part of the landing demonstration, the reusable launch vehicle will be lifted by the Indian Air Force's helicopter to a designated altitude and then dropped.
- Following this, the system will take over and ISRO hopes that the fly-by-wire system will ensure a safe and intact landing just like an aircraft on a runway.
- Initially, ISRO had planned the lifting to be conducted by a Mi-17 chopper. However, with IAF getting Chinooks, that plan is likely to change. The date for the landing demonstration will be released once the lifting trial is completed with the IAF's heavy-lift helicopter.

## HEALTH

### A NEW CORONAVIRUS VARIANT ON THE BLOCK

#### Context:

- India's first case of the XBB.1.5 subvariant of Omicron

was confirmed in Gujarat by the national genome sequencing consortium on December 31.

- XBB.1.5 has been driving COVID-19 cases in the U.S. Studies of the strain indicate that it is highly transmissible and evades pre-existing immunity. Yet it doesn't seem to cause severe disease.
- The global prevalence of XBB.1.5 isn't clear yet, although its parent strain has been detected in at least 35 countries.



### How did the variant begin?

- XBB.1.5 is a recombinant, which means its genome is the product of the genomes of two different strains spliced together. This can happen when two strains infect a person at the same time; a recombinant variant is produced as they replicate together.
- Recombinant strains also arise when existing recombinant strains mutate. Previous recombinants include XD (Delta + Omicron), XE (BA.1 + BA.2), and XBB (BA.2.10.1 + BA.2.75). The XBB strain is descended from BA.2.10.1.1 and BA.2.75.3.1.1.1.
- It mutated further and became XBB.1.5. XBB.1, which also descended from XBB, accounted for 14% of new cases in India around mid-December 2022.

### How transmissible is it?

- XBB.1.5 is as immune-evasive as XBB.1. Both XBB and XBB.1 were more immune-evasive than BA.5.2 (its descendant BF.7 is surging in China) and in fact are the most evasive strains so far.
- XBB.1.5 is better at binding to ACE2 receptors in the body than XBB or XBB.1. So XBB.1.5 is more transmissible. There is already empirical data to show that it spreads faster than BQ.1.1, the subvariant that it displaced in the U.S. as the dominant strain.
- However, that XBB.1.5's ACE2 binding affinity is comparable to that of BA.2.75, the Omicron sub-variant detected in India in May 2022. The transmissibility of XBB.1.5 is otherwise still high: it allows the virus to spread more, giving it more opportunities to mutate to more potent forms.
- XBB.1.5 has an ACE2 binding affinity similar to that of BA.2.75, could be more transmissible than XBB and XBB.1, and be as immune-evading as the two.
- Overall, it has a high growth advantage. And so far, it doesn't appear to be able to cause severe disease.

### What are the implications for India?

- Variants would have been of some concern if the virus's transmission wasn't ongoing; however, as most settings have continuous virus transmission without clinical disease, even reduced efficacy against new variants in the real world has been compensated for by natural infections and booster doses.
- The research on new vaccines should continue but that it shouldn't peg them to newer sub-variants: by the time such vaccines are made available, a new subvariant might emerge.

### VIRAL NUTRITION: NEW STUDY REVEALS MICROBES NOURISHED BY CONSUMING VIRUSES



### Why in news?

- A new study by researchers at the University of Nebraska-Lincoln have reported that a particular genus of plankton can consume viruses as well as "grow and divide given only viruses to eat".
- They already know of other cells that can 'consume' viruses in an effort to destroy them such as the macrophage cells of the human immune system.
- The difference lies in being able to 'eat' viruses to fulfil one's biological imperatives.

### Background:

- At various peaks of the COVID-19 pandemic, viruses have had a reputation as destroyers of public health systems and human lives.
- They have a peculiar biology, while inert outside a living body, but inside, they hijack the cellular machinery to feed, replicate and spread.
- This association with disease and death has come to define their form in the public imagination, redeemed not even by the fact that there are other microbes that destroy viruses.

### Genus Halteria:

- Plankton of the genus Halteria, they claim to have found, can each consume 10,000 to a million virus particles a day, increase their population using the metabolised energy, and provide more food for the zooplanktons that consume the Halteria. This could be significant for the marine food chain.

### What are plankton?

- Plankton are microscopic organisms that can only move with a current. They don't have any facilities to actively propel themselves.
- Halteria plankton are ciliates, meaning they have hair-like structures called cilia on their surface.
- Sometimes they can beat some of these cilia to jump short distances, but not often as it they can't do this often because it requires too much energy.

### What do plankton do in the food chain?

- A type of plankton is found nearer the surface of many water bodies. It is an autotroph, which means it can make its own food which it does by consuming carbon dioxide, among other compounds, through photosynthesis.
- Small fish and larger plankton called zooplankton eat phytoplankton for their nutrition; they are in turn eaten by larger fish, and so forth.
- When phytoplankton die, they drift around where they are, becoming part of a coastal nutrient cycle, or they drift down towards the seafloor, where they decompose. Their constituents then become available for microbes or are sequestered into the seafloor.
- So, phytoplankton bring carbon and other nutrients from the atmosphere and sea surface down to the seafloor and help replenish the food chain (and also 'trap' carbon into their own bodies and as sediments). They are joined by bacteria that make their own food by oxidising sulphur, iron or hydrogen, in a process called chemosynthesis.

### The role of Halteria:

- Halteria plankton are found in large numbers in freshwater bodies. They are heterotrophs meaning they can't produce their own food. Instead, they are well-known bacterivores, they consume bacteria to power themselves.
- By also consuming viruses for nutrition, Halteria plankton can recover the nutrients lost in the viral shunt and bring them back into the food chain.
- This flow would depend on virion size and nutritional content, which varies among strains, but it is already clear that viruses of a wide range of sizes can be taken up.
- In the new study, the researchers found that Halteria plankton reduced the population of chloroviruses 'fed' to them while growing their own numbers whereas Paramecium ciliates consumed the chloroviruses but didn't proliferate.
- They don't yet know how Halteria feeding on viruses could have affected viral evolution.

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## INDIA'S PLAN TO ERADICATE MEASLES, RUBELLA

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### Context:

- India had set a target to eliminate measles and rubella

(MR) by 2023, having missed the earlier deadline of 2020, due to a variety of reasons, exacerbated by disruptions due to the pandemic.



- An earlier target that was set for 2015 was also missed.
- It was in 2019 that India adopted the goal of measles and rubella elimination by 2023, anticipating that the 2020 goal could not be reached.

### Why is this target crucial?

- The measles virus is one of the world's most contagious human viruses that kills more than 1,00,000 children every year globally, and rubella is a leading vaccine-preventable cause of birth defects, according to the World Health Organization (WHO).
- Both measles and rubella can be prevented by just two doses of a safe and effective vaccine.
- Over the past two decades, the measles vaccine is estimated to have averted more than 30 million deaths globally.
- In both diseases, the symptoms are a rash and fever.
- While measles has a high fatality rate, rubella infection in a pregnant woman will have an impact on the foetus, resulting in birth defects.

### Outbreak in 2022:

- From October 2022, an outbreak of measles in Maharashtra, particularly Mumbai, had the authorities worried.
- As per media reports at least 15 children died among several hundreds who contracted the infection. Coming at the cusp of a year in which India had a crucial target to achieve, it perturbed authorities.
- The 2022 outbreak was like epidemiological compensation. However, experts aver that this outbreak will contribute to ramping up herd immunity in the population which along with a robust vaccination programme will help achieve the necessary targets.

### What has India done to achieve targets?

- During 2010–2013, India conducted a phased measles catch-up immunisation for children aged 9 months–10 years in 14 States, vaccinating approximately 119 million children.
- Mission Indradhanush was launched in 2014 to ramp up vaccinating the unvaccinated population.

- During 2017–2021, India adopted a national strategic plan for measles and rubella elimination, and introduced rubella-containing vaccine (RCV) into the routine immunisation programme, besides launching a nationwide measles-rubella supplementary immunisation activity (SIA) catch-up campaign.
- It also transitioned from outbreak-based surveillance to case-based acute fever and rash surveillance, and more than doubled the number of laboratories in the measles-rubella network.

### Way Forward:

- A well-oiled machinery rests in place, and it is possible to be free of the disease as some other countries have recently demonstrated, including Sri Lanka, the Maldives and South Korea.
- It is important to provide full support to the ground level staff who implement the programme – the village health nurses, ASHA (accredited social health activists) workers, anganwadi and ICDS (Integrated Child Development Services) workers.
- The WHO has expressed hope that India could indeed reach the target.

## MISCELLANEOUS

### SUBHASH CHANDRA BOSE AAPDA PRABANDHAN PURASKAR-2023



### Why in news?

- For the year 2023, Odisha State Disaster Management Authority (OSDMA) and Lunglei Fire Station (LFS), Mizoram, both in the Institutional category, have been selected for the Subhash Chandra Bose Aapda Prabandhan Puraskar-2023 for their excellent work in Disaster Management.

### Winners:

#### OSDMA:

- Odisha State Disaster Management Authority (OSDMA), was established in 1999 in the aftermath of the Super Cyclone.
- OSDMA embarked on multiple initiatives including raising of the Odisha Disaster Response Action Force (ODRAF), Multi-hazard Early Warning Service

(MHEWS) framework, and a cutting-edge technology-enabled web/smartphone-based platform called "SATARK" (System for Assessing, Tracking, and Alerting Disaster Risk Information based on Dynamic Risk Knowledge).

- OSDMA provided effective response during various cyclones, Hudhud (2014), Fani (2019), Amphan (2020) and Odisha floods (2020).

#### Lunglei Fire Station:

- Lunglei Fire Station, Mizoram, responded efficiently and effectively to a massive forest fire which was reported on 24 April 2021 in the uninhabited forest areas that surrounded Lunglei town and spread to more than 10 village council areas.
- Lunglei Fire Station personnel assisted by local civilians worked continuously for more than 32 hours during which they motivated and provided on the spot training to residents.
- Due to the valiant, brazen and prompt efforts of Fire & Emergency staff in the putting out the flames, there was no loss to life and property and the spread of fire to other parts of the State was prevented.

#### About Subhash Chandra Bose Aapda Prabandhan Puraskar:

- The Government of India under the leadership of Prime Minister has instituted an annual award known as Subhash Chandra Bose Aapda Prabandhan Puraskar to recognize and honour the invaluable contribution and selfless service rendered by individuals and organizations in India in the field of disaster management.
- The award is announced every year on 23rd January, the birth anniversary of Netaji Subhash Chandra Bose.
- The award carries a cash prize of Rs. 51 lakh and a certificate in case of an institution and Rs. 5 lakh and a certificate in case of an individual.

### UNION SPORTS MINISTRY FORMS OVERSIGHT COMMITTEE HEADED BY KHEL RATNA MC MARY KOM TO ENQUIRE INTO ALLEGATIONS AGAINST WFI



**Why in news?**

- Recently, the Ministry of Sports has formed an Oversight Committee to enquire into the allegations of sexual misconduct, harassment and/intimidation, financial irregularities and administrative lapses, levelled by prominent sportspersons.
- The Oversight Committee will also undertake the day-to-day administration of WFI, during the course of the enquiry.

**Agenda:****The Committee has been formed**

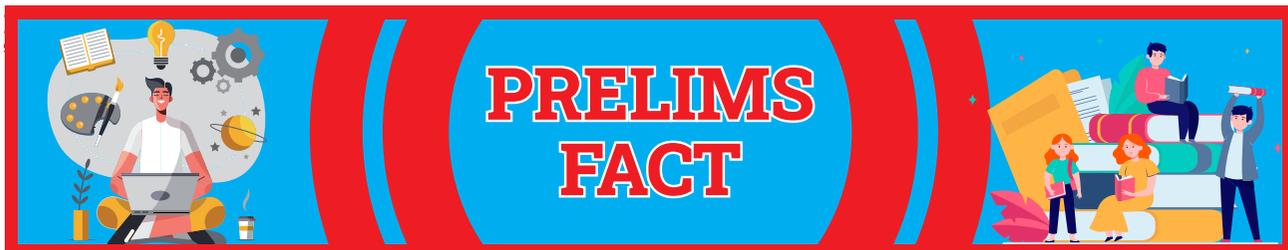
- To safeguard the interest of athletes, following complaints by wrestlers of sexual harassment by the President, other officials and coaches of the Wrestling Federation of India, and
- To promote good governance in WFI following allegations of financial mismanagement and arbitrariness by athletes.

**Members:**

- The Oversight Committee will be headed by Khel Ratna Awardee MC Mary Kom, Chairperson, Athletes Commission, Khel Ratna Awardee Yogeshwar Dutt, executive council member, IOA, Dhyanchand awardee Trupti Murgunde, member Mission Olympic Cell, Radhica Sreeman, Ex-Executive Director, TEAMS, Sports Authority of India, Crd (Retd) Rajesh Rajagopalan, Ex-CEO, Target Olympic Podium Scheme.

**What's next?**

- The oversight committee will complete the enquiry within 4 weeks.
- The Ministry has instructed the executive committee of WFI to abstain from managing the day-to-day activities of the federation, with immediate effect, until further communication.



## POLITY & GOVERNANCE

### SC UPHOLDS 2016 DECISION ON DEMONETISATION BY 4:1 MAJORITY VERDICT

#### THE VERDICT

**What the majority judgment said**

- ▶ Note-ban move had no legal or constitutional flaws
- ▶ Decision passed the test of proportionality
- ▶ There was a reasonable nexus between measures and objectives
- ▶ Bench headed by CJ can decide on validity of note ban

#### THE DISSENTING VOICE

"THERE WAS NO INDEPENDENT APPLICATION OF MIND BY THE RBI... PARLIAMENT CANNOT BE LEFT ALOOF ON SUCH IMPORTANT DECISIONS"

Justice B V Nagarathna



**DEMONETISATION IMPACT**

<b>66%:</b> Average annual growth in digital payment volumes between FY18 and FY22	<b>14%:</b> CAGR of cash in use during this period	<b>11.5%:</b> Higher cash in circulation would have been sans demonetisation
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**36.5%:** Volume of high-value notes (₹500 and ₹2,000) in March 2022, compared to 24.4% in March 2016 (for ₹500 and ₹1,000 notes)

#### Why in news?

Recently, a five-judge Constitution Bench of the Supreme Court upheld the Modi government's 2016 decision to demonetise Rs 500 and Rs 1,000 currency notes by a 4:1 majority verdict saying the decision was about executive policy and could not be reversed.

#### Details:

- The court rejected the 58 petitions challenging demonetisation and said the decision-making process of the government was not flawed.
- The judgment, authored by Justice B R Gavai, was agreed to by judges S Abdul Nazeer, A S Bopanna, and V Ramasubramanian.
- Justice B V Nagarathna faulted demonetisation in her dissenting judgment but did not quash it.

#### Test of Proportionality:

- The judgment said there was consultation between the Centre and the Reserve Bank of India (RBI) for six months, indicating a "reasonable nexus between the measures undertaken and the object sought to be achieved" and, therefore, the demonetisation notification passed the test or doctrine of "proportionality".
- Test of Proportionality means examining whether the measure (demonetisation) was in proportion with

the outcome sought to be achieved, like eradicating black marketing, terror financing, etc and whether there were consultations between the Centre and the RBI prior to the note ban.

- This means the petitioners who had not got relief from this verdict can take the issue before an appropriate Bench by the Chief Justice of India for deciding issues linked to the validity of demonetisation. However, legal experts said this issue could only be challenged if a review petition was filed against the verdict.

#### Centre's stand:

- The Centre told the Supreme Court that the step was taken after extensive consultations with the RBI and that preparations were made before the note ban was enforced.
- It had added the demonetisation exercise was a "well-considered" decision and part of a larger strategy to combat the menace of fake money, terror financing, black money, and tax evasion.

#### Dissenting view:

- Justice Nagarathna differed with the majority judgment and said it missed the main issue, namely that the RBI should initiate the demonetisation process and not the Centre.
- She differed with the majority about Section 26(2) of the RBI Act, which states the government can, through a gazette notification, declare that a denomination of a bank note can cease to be legal tender, on the recommendation of the central board of the RBI.
- She said the demonetisation process was illegal but it could not be reversed now. Parliament should have discussed the law on demonetisation and it should not have been done by a gazette notification. However, the process was well-intended and its objective was to combat the black money, terror funding, hawala transactions, and other such practices.
- The judgment will send out a strong message to the public and business communities about the need to undertake financial transactions by legitimate means and the courts are not guided by a populist agenda or public outcry in matters of critical economic policies.

#### Background:

- On November 8, 2016, Prime Minister Narendra Modi announced a ban on currency notes of Rs 500 and Rs 1,000, stating that it would reduce the use of black money and counterfeit currency.
- However, several reports of distress among citizens due to long queues and cash shortages emerged,

compounded by frequent changes in rules by the RBI over the next couple of months.

- The RBI had earlier admitted in its submission that there were “temporary hardships” and they, too, are an integral part of the nation-building process, but there was a mechanism by which problems that arose were solved.

### CINEMA HALLS, MULTIPLEXES HAVE THE RIGHT TO PROHIBIT OUTSIDE FOOD, SAYS SC



#### Why in news?

- Recently, the Supreme Court ruled the owners of cinema halls are entitled to set the terms and conditions for the sale of food and beverages and can determine whether outside food should be permitted within the theatre precincts.
- The Supreme Court set aside a direction of the Jammu and Kashmir High Court which had in July 2018 directed multiplex and cinema hall owners there not to prohibit movie goers from carrying their own food articles and water inside the theatres.

#### Details:

- A Bench of Chief Justice D.Y. Chandrachud and Justice P.S. Narasimha observed that cinema hall is a private property of the owner, who is entitled to have terms and conditions so long as they are not contrary to public interest, safety and welfare.
- The Supreme Court was hearing a batch of pleas challenging the direction given by the Jammu and Kashmir High Court.

#### Key Highlights:

- The Bench said whether or not to see a movie is entirely the choice of the viewer and, if he or she seeks to enter a cinema hall, they have to abide by the terms and conditions subject to which the entry is granted.
- The Bench observed the fundamental aspect which needs to be noted is that the trade and business of conducting a cinema theatre is subject to regulation by the state which has framed the Jammu and Kashmir Cinemas (Regulation) Rules, 1975.
- The Bench said it needed no emphasis that the rule making power of the state has to be exercised in a manner consistent with the fundamental right of

the hall owners to carry on a legitimate trade and business within the meaning of Article 19 (1)(g) of the Constitution.

#### Exceptions:

- The Supreme Court, however, said that cinemas should allow parents to bring food for infants and children and provide free drinking water to all visitors.
- It observed that whether or not to purchase, food or beverages after being given admission to the cinema hall is entirely the choice of a movie goer.

### SC TRANSFERS TO ITSELF ALL PLEAS RELATED TO SAME-SEX MARRIAGE



#### Why in news?

- Recently, the Supreme Court transferred to itself petitions pending in various High Courts seeking legal recognition of same-sex marriage.

#### Details:

- A three-judge Bench led by Chief Justice of India D.Y. Chandrachud said there was broad consensus among the petitioners to shift the cases to the Supreme Court for an authoritative ruling on the issue, especially on the question whether same-sex marriage should be brought within the ambit of the Special Marriage Act of 1954.
- Batches of petitions were pending before the Delhi, Kerala and Gujarat High Courts.

#### Petitions:

- One of the petitions said the non-recognition of same-sex marriage amounted to discrimination that struck at the root of dignity and self-fulfilment of LGBTQ+ couples.
- The court issued notice in a separate petition challenging the mandatory requirement to issue public notice and objection to marriage contemplated under the Special Marriage Act and the Foreign Marriage Act. They argued that the provisions expose same-sex couples to the risks of ostracism, persecution, and violence.
- The petitioners had argued that the case was a sequel to the 2018 Constitution Bench judgment in the Navtej Johar case in which homosexuality was decriminalised. The petitioners said the 1954 Act should be made gender-neutral.

**What's next?**

- The SC Bench directed the Centre to file its response to the petitions on or before February 15.
- The court listed the case for directions on March 13.

### PM MODI LAUNCHES ASPIRATIONAL BLOCK PROGRAMME, ASKS CHIEF SECRETARIES TO END 'MINDLESS COMPLIANCES'

**Why in news?**

- Recently, the Prime Minister launched the Aspirational Block Programme on the lines of a similar exercise aimed at developing backward districts.
- He asserted that India is focussing on the four pillars of infrastructure, investment, innovation and inclusion to be a developed country.

**Second national conference on chief secretaries:**

- Chairing the second national conference on chief secretaries from states, PM Modi said the entire world is looking to India to bring stability to the global supply chain and asked them to take steps for making the MSME sector "global champions" and a part of the global value chain.
- He said the country can take full advantage of this only if states take lead by maintaining focus on quality and making decisions with an "India-first" approach.
- He said the states should focus on pro-development governance, ease of doing business, ease of living and provision of robust infrastructure.

**About Aspirational Block Programme:**

- The Aspirational Blocks Programme is on the lines of the Aspirational District Programme that was launched in 2018 and covers 112 districts across the country.
- This new programme is aimed at improving performance of blocks lagging on various development parameters.
- This will enable holistic development in those areas that require added assistance.
- The programme will cover 500 districts across 31 states and Union Territories initially.
- Over half of these blocks are in 6 states—Uttar Pradesh (68 blocks), Bihar (61), Madhya Pradesh (42), Jharkhand (34), Odisha (29) and West Bengal (29).

### SC DIRECTS COMMITTEE TO BUILD A FRAMEWORK TO ENSURE ROAD SAFETY

**Why in news?**

- The Supreme Court directed its committee led by a former apex court judge, Justice A.M. Sapre, to meet with the Road Transport Secretary and work out a framework to mould State-specific guidelines for the electronic monitoring and enforcement of road safety.
- The court acknowledged that speeding was the main cause of fatal accidents on Indian roads.

### Provisions for electronic monitoring and enforcement of road safety:

**Section 136A:**

- A Bench led by Chief Justice D.Y. Chandrachud agreed that urgent steps need to be taken to enforce Section 136A (electronic monitoring and enforcement of road safety) of the Motor Vehicles Act, 1988.
- The provision was introduced into the Act in 2019 to keep an electronic eye on errant drivers.
- Additional Solicitor General said the government has already framed rules under sub-section (2) of Section 136A.
- Section 136 (2) mandated the Centre to "make rules for the electronic monitoring and enforcement of road safety including speed cameras, closed-circuit television cameras, speed guns, body wearable cameras, and such other technology".

**Sections 215A and B:**

- Sections 215A and B provided the functions of electronic monitoring to the States and the formation of a National Road Safety Board in an advisory capacity.
- Moreover, road safety councils were to be set up at the national, State, and district levels.

### PM MODI TO INAUGURATE PRAVASI BHARATIYA DIVAS CONVENTION IN INDORE

**Why in news?**

- The Prime Minister inaugurated the 17th edition of the Pravasi Bharatiya Divas convention in Madhya Pradesh's Indore city.



### Theme:

- The theme of the Pravasi Bharatiya Divas (PBD) Convention 2023 is: "Diaspora: Reliable Partners for India's progress in Amrit Kaal".

### Details:

- PM also inaugurated the first-ever digital PBD exhibition on the theme "Azadi Ka Amrit Mahotsav – Contribution of Diaspora in Indian Freedom Struggle" to highlight the contribution of the diaspora freedom fighters in India's Independence, an official said.
- A commemorative postal stamp 'Surakshit Jaayen, Prashikshit Jaayen' will be released to underline the importance of safe, legal, orderly and skilled migration.

### Chief Guests:

- President of the Cooperative Republic of Guyana Dr Mohamed Irfaan Ali will be the chief guest and the Republic of Suriname President Chandrikapersad Santokhi will be the special guest of honour.

### Participants:

- More than 3,500 diaspora members from 70 countries have registered for the event, which is being organised in physical mode for the first time since 2019.
- The 16th edition of the Pravasi Bharatiya Divas (PBD) convention was held in virtual mode in 2021 due to the COVID-19 pandemic.

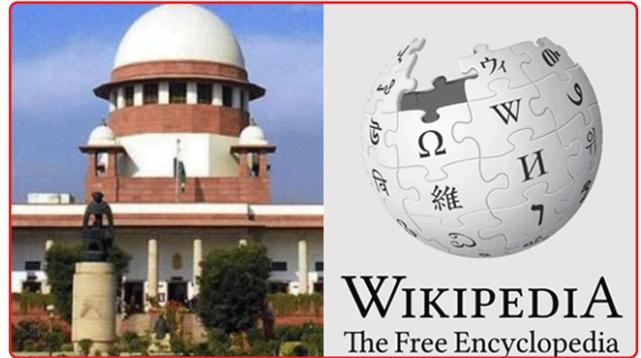
### About PBD:

- The Pravasi Bharatiya Divas is celebrated on January 9 to mark the arrival of Mahatma Gandhi in Mumbai from South Africa on that day in 1915.
- Since 2003, PBD conventions have been held annually. However, its format was revised since 2015 to celebrate the Pravasi Bharatiya Divas once every two years.

## ONLINE SOURCES SUCH AS WIKIPEDIA NOT COMPLETELY DEPENDABLE: SC

### Why in news?

- Online sources such as Wikipedia are based on a crowd sourced and user generated editing model that is not completely dependable and can promote misleading information, the Supreme Court has said.



### Details:

- A bench of Justices said it acknowledged the utility of the platforms that provide free access to knowledge across the globe but also cautioned against using such sources for legal dispute resolution.
- The apex court said courts and adjudicating authorities should endeavour to persuade counsels to rely on more reliable and authentic sources.

### What was the case before SC?

- The observations came in a judgment in a case regarding the correct classification of imported 'All in One Integrated Desktop Computer' under the First Schedule to the Central Excise Tariff Act, 1985.
- The SC noted that adjudicating authorities, especially the Commissioner of Customs (Appeal) had extensively referred to online sources such as Wikipedia to support their conclusions.

### Earlier case:

- Interestingly, former apex court judge Justice Markandey Katju had referred to Wikipedia for definition of the term "common law marriage" while delivering a judgment in 2010.
- Justice Katju had made information available on Wikipedia the basis for formulating a four-point guideline and ruled that live-in relationships must satisfy it to be categorised as a "relationship" in the nature of marriage under the Prevention of Domestic Violence Act, 2005.

## SC BACKS RIGHT TO FREE SPEECH OF 2 LAWYERS UP FOR JUDGESHIP



**Why in news?**

- The Supreme Court Collegium recently backed the right to free speech of two lawyers recommended for appointments as judges in the Madras and Bombay High Courts.

**Excerpts of judgement:**

- All citizens have the right to free speech and expression under Article 19(1)(a) of the Constitution.
- Expression of views by a candidate does not disentitle him to hold a constitutional office so long as the person proposed for judgeship is a person of competence, merit and integrity.
- It refused to drop the name of advocate R. John Sathyan for the Madras High Court merely because the government received an Intelligence Bureau report that he had shared a Web portal's article critical of Prime Minister Narendra Modi and another regarding the death of a medical aspirant who was unable to clear NEET, while portraying it as a "political betrayal".

**Decision of the collegium:**

- Instead, the collegium, said Mr. Sathyan should get precedence over all the other names recommended by the collegium on that day. It also drew the Centre's attention to the part of the same IB report which said Mr. Sathyan did not have any "overt political leanings" and his integrity was intact.
- On Bombay High Court advocate Somasekhar Sundaresan, the government had deduced that he was a "highly biased opinionated person" from his social media posts.
- It accused Mr. Sundaresan of being "selectively critical on social media on the important policies, initiatives and directions of the government".

**Other recommendations:**

- The collegium reiterated the names of advocates Amitesh Banerjee and Sakya Sen for Calcutta High Court judgeships.
- It had recommended these two names four years ago in December 2018. The government returned them in November 2022 without citing "fresh material or ground" for its objection.

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**PM PARTICIPATES IN CEREMONY TO  
NAME 21 LARGEST UNNAMED ISLANDS  
OF ANDAMAN & NICOBAR ISLANDS AFTER  
21 PARAM VIR CHAKRA AWARDEES**

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**Why in news?**

- On Parakram Diwas, the Prime Minister, participated in a ceremony to name the 21 largest unnamed islands of Andaman & Nicobar Islands after 21 Param Vir Chakra awardees via video conferencing.
- During the programme, he also unveiled the model of the National Memorial dedicated to Netaji to be built on Netaji Subhas Chandra Bose Dweep.

**Background:**

- Keeping in mind the historical significance of the Andaman & Nicobar Islands and to honour the memory of Netaji Subhas Chandra Bose, Ross Islands was renamed as Netaji Subhash Chandra Bose Dweep by the Prime Minister during his visit to the Island in 2018.
- Neil Island and Havelock Island were also renamed Shaheed Dweep and Swaraj Dweep.

**New name:**

- Giving due respect to the real-life heroes of the country has always been accorded the highest priority by the Prime Minister. Going ahead with this spirit, it has now been decided to name the 21 largest unnamed islands of the island group after 21 Param Vir Chakra awardees.
- The largest unnamed island will be named after the first Param Vir Chakra awardee, the second largest unnamed island will be named after the second Param Vir Chakra awardee, and so on. This step will be an everlasting tribute to our heroes, several of whom made the ultimate sacrifice to protect the sovereignty and integrity of the nation.
- These islands have been named after the 21 Param Vir Chakra awardees. Major Somnath Sharma; Subedar and Hony Captain (then Lance Naik) Karam Singh, MM; 2nd Lt. Rama Raghoba Rane; Nayak Jadunath Singh; Company Havildar Major Piru Singh; Capt GS Salaria; Lieutenant Colonel (then Major) Dhan Singh Thapa; Subedar Joginder Singh; Major Shaitan Singh; CQMH. Abdul Hamid; Lt Col Ardeshir Burzorji Tarapore; Lance Naik Albert Ekka; Major Hoshiar Singh; 2nd Lt. Arun Khetrapal; Flying Officer Nirmaljit Singh Sekhon; Major Ramaswamy Parameswaran; Naib Subedar Bana Singh; Captain Vikram Batra; Lt Manoj Kumar Pandey; Subedar Major (then Rifleman) Sanjay Kumar; and Subedar Major Retd (Hony Captain) Grenadier Yogendra Singh Yadav.

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**NBDA SEEKS WITHDRAWAL OF DRAFT  
AMENDMENT TO IT RULES-2021**

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**Why in news?**

- Recently, the News Broadcasters & Digital Association (NBDA) sought the withdrawal of a draft amendment to the Information Technology Rules-2021, which

empowers the Press Information Bureau's fact-check unit, or any other agency authorised by the Centre, to get the social media platforms to remove the contents identified by it as fake or false.



### Key Highlights:

- It said conferring such powers on the government without any checks and balances would result in "muzzling the fourth pillar of democracy and also have a chilling effect on the media".
- The amendment, which has been proposed by the Ministry of Electronics & Information Technology, would stifle the freedom of speech and expression of the media guaranteed under Article 19 (1) (a) of the Constitution.
- The amendment would give the PIB and the Central government excessive powers to regulate digital news content without any scrutiny.
- It would directly affect the news media as the intermediaries might be coerced or directed by the PIB or any other agency to take down alleged "fake news" content without following the principles of natural justice. This will also result in preventing any comment or criticism of the government.

### Way Forward:

- There are sufficient legislations, regulations and statutory bodies, which regulate the news media.
- Therefore, introducing the aforementioned amendment would lead to excessive regulation by the government which is neither desirable nor acceptable. This kind of censorship is not envisaged by the Constitution.

## GOVT NOTIFIES GRIEVANCES APPELLATE COMMITTEES TO LOOK INTO COMPLAINTS AGAINST SOCIAL MEDIA FIRMS

### Why in news

- The Centre recently notified three grievances appellate committees that will address users' complaints against social media and other internet-based platforms.
- The notification is part of the tighter IT rules, notified

in October 2022 for setting up government-appointed GACs.



### Details

- The objective of establishing the GACs is to settle the issues that users may have against the manner in which social media platforms initially addressed their complaints regarding content and other matters.
- Each of the three GACs (grievances appellate committees) will have a chairperson, two whole-time members from different government entities and retired senior executives from the industry for a term of three years from the date of assumption of office.

### First panel

- The first panel will be chaired by the chief executive officer of the Indian Cyber Crime Coordination Centre under the Ministry of Home Affairs.
- Retired Indian Police Service (IPS) officer Ashutosh Shukla and Punjab National Bank's (PNB) former chief general manager and chief information officer Sunil Soni have been appointed as the whole-time members of the panel.

### Second panel

- The second panel will be chaired by the joint secretary in charge of the Policy and Administration Division in the Ministry of Information and Broadcasting.
- Indian Navy's retired Commodore Sunil Kumar Gupta and Kavindra Sharma, former vice-president (consulting), L&T Infotech, have been appointed as the whole-time members of this panel.

### Third panel

- The third panel will be chaired by Kavita Bhatia, a senior scientist at the Ministry of Electronics and Information Technology.
- Former traffic service officer of the Indian Railways Sanjay Goel and former managing director and chief executive officer of IDBI Intech Krishnagiri Ragothamarao have been appointed as the whole-time members of the third panel.

### Way Forward

- The provision of safe harbour under IT laws gives internet platforms; social media, e-commerce etc. protection from the content posted by users.

## INTERNATIONAL RELATION

## INDIA AND AUSTRIA TO SIGN MIGRATION AND MOBILITY AGREEMENT, SHORE UP TIES

**Why in news?**

- India and Austria will sign five agreements on Monday and two of them are in the interest of the Indian community staying in the latter country, External Affairs Minister S Jaishankar said.
- Close on the heels of similar mobility agreements with France, the United Kingdom, Germany and Finland, India will sign a "Comprehensive Migration and Mobility Partnership Agreement" (MMPA) with Austria.

**Significance:**

- While India has been keen to finalise these agreements with European countries as a stepping stone to resolving issues over the long-pending India-European Union (EU) Free Trade Agreement and facilitating Indian professionals working in these countries, the European countries also see them as a way to curb illegal immigration from India.
- This is a much-needed agreement, especially in view of the sharp increase in illegal migration Austria was confronted with in 2022, including over 15,000 illegal migrants from India with practically no chance of asylum. The agreement is now a useful tool to combat illegal migration together, as it enables the swift return of illegal migrants.
- In addition, the agreement will regulate multiple entry visas for professionals and student exchange programmes, and will be reviewed regularly by a Joint Working Group.

**Background:**

- Indian External Affairs Minister is on an official visit to Austria.
- This will be the first EAM-level visit from India to Austria in the last 27 years, and takes place against the backdrop of 75 years of diplomatic relations in 2023.

## INDIA TAKES OVER LEADERSHIP OF THE ASIAN PACIFIC POSTAL UNION

**APPU** Asian-Pacific Postal Union  
taking posts into the future


**Why in news?**

- India will take over the leadership of the Asian Pacific Postal Union (APPU) having its Headquarters in Bangkok, Thailand in January 2023.

**Details:**

- Secretary General leads the activities of the Union and is also the Director of the Asian Pacific Postal College (APPC) which is the largest intergovernmental postal training institute in the region.
- Following the successful elections held during the 13th APPU Congress held in Bangkok during August-September 2022, Dr. Vinaya Prakash Singh, erstwhile Member (Personnel), Postal Services Board will take over the charge of Secretary General of the Union for a tenure of 4 years.

**About APPU:**

- Asian Pacific Postal Union (APPU) is an intergovernmental organization of 32-member countries of the Asian-Pacific region.
- APPU is the only Restricted Union of the Universal Postal Union (UPU) in the region, which is a specialized agency of the United Nations.
- The goal of APPU is to extend, facilitate and improve postal relations between member countries and to promote cooperation in the field of postal services.
- As the regional center for various UPU projects, APPU also takes the lead in ensuring that all technical and operational projects of the UPU are fulfilled in the region so that the region is integrated into the global postal network in the best possible way.

## INDIA DEPLOYS PLATOON OF WOMEN PEACEKEEPERS IN UN MISSION IN ABYEI

**Why in news?**

- India is deploying a platoon of women peacekeepers in Abyei, the country's largest single unit of female Blue Helmets in a UN mission since 2007.

**Details:**

- The platoon of women peacekeepers will be deployed in Abyei as part of the Indian Battalion in the United Nations Interim Security Force, Abyei (UNISFA).



- This will be India's largest single unit of women Peacekeepers in a UN Mission since the first-ever all-women's contingent in Liberia in 2007.
- The Indian contingent, comprising two officers and 25 other ranks, will form part of an engagement platoon and specialise in community outreach and will be performing extensive security-related tasks as well.

**Background:**

- The women peacekeepers are "highly regarded" in UN missions throughout the world for their ability to reach out and connect with women and children in local populations, especially victims of sexual violence in conflict zones.
- In 2014, Shakti Devi of the Jammu and Kashmir Police, who was deployed in the UN Assistance Mission in Afghanistan (UNAMA), was named the recipient of the International Female Police Peacekeeper Award by the UN's Police Division for her "exceptional achievements" with the UN mission in Afghanistan, including her efforts towards helping victims of sexual and gender-based violence.

**India's contribution:**

- As of October 31, 2022, India is the second largest contributor to UN peacekeeping missions with 5887 troops and personnel deployed across 12 missions, after Bangladesh (7,017).

**INDO-BANGLA FRIENDSHIP PIPELINE LIKELY TO BE COMMISSIONED**



**Why in news?**

- The ambitious 130-km long Indo-Bangla Friendship Pipeline (IBFPL), constructed at a cost of Rs 377.08 crore, is likely to be commissioned soon.

**Details:**

- The international oil pipeline, IBFPL, will carry fuel from Assam-based Numaligarh Refinery Ltd's (NRL) marketing terminal at Siliguri in West Bengal to the Parbatipur depot of Bangladesh Petroleum Corporation (BPC).
- In NRL, Oil India Ltd has 69.63 per cent stake, while Assam Government and Engineers India Ltd have 26 per cent and 4.37 per cent holding respectively.

**Background:**

- The ground breaking ceremony for the 130-km IBFPL was held in September 2018 in the presence of Prime Ministers of India and Bangladesh through video conferencing.
- Indian Prime Minister in 2017 had agreed to finance this pipeline with a capacity of one million metric tonne per annum (MMTPA).
- The total project cost for construction of the IBFPL is Rs 377.08 crore. Out of this, NRL's investment is Rs 91.84 crore for the India portion of the pipeline, while the remaining Rs 285.24 crore for Bangladesh portion is being funded by the Indian government as grant-in-aid.

**Way Forward:**

- The IBFPL has been successfully implemented because of the true friendship between India and Bangladesh, and it will remain as a testimony of best relationship between the two South East Asian nations, she added.

**INDIA, BRITAIN SIGN AND EXCHANGE LETTERS FOR YOUNG PROFESSIONALS SCHEME**



**Why in news?**

- The governments of India and the U.K. marked Pravasi Bharatiya Divas on January 9 by kicking off the Young Professionals Scheme, which will permit up to 3,000 of their degree-holding citizens aged between 18 and 30 to live and work in each other's countries for a period of two years.

⇒ The launch of the scheme, which was conceived as part of an India-U.K. Migration and Mobility MoU signed in May 2021, was announced in November at the G20 summit in Bali, where U.K. Prime Minister held talks with Indian Prime Minister.

### Key Highlights:

- ⇒ Young Indians and Britons would be able to travel to each other's countries either for work or study, or visit, for two years. The scheme allows for exchange visas for up to 3,000 individuals per year.
- ⇒ Successful candidates could look for a job, educational or cultural opportunity once they arrived in their host country. Or they could just visit.
- ⇒ The signing of the agreement belies more complex issues around the movement of persons across borders. Part of the Migration and Mobility agreement of 2021 seeks to address the return of illegal migrants to their home countries.
- ⇒ The government is also seeking greater ease in the movement of skilled professionals and students from India to the U.K. as part of the trade discussions, the sixth round of which took place in New Delhi in December.

### Way Forward:

- ⇒ The scheme, which will run for a period of three years initially, would hopefully be "up and running in March".

## CHINA, BHUTAN OFFICIALS MEET IN KUNMING, AGREE TO 'PUSH FORWARD' BOUNDARY TALKS



### Why in news?

- ⇒ Recently, China and Bhutan agreed to "push forward" a three-step roadmap as an expert group meeting held boundary talks in the southwestern Chinese city of Kunming.

### Key Highlights:

- ⇒ Both sides "agreed to simultaneously push forward the implementation of all the steps of the Three-Step Roadmap" as well as "increase the frequency of the expert group meetings and to keep contact through diplomatic channels on holding the 25th Round of China-Bhutan Boundary talks as soon as possible".
- ⇒ Following the talks, both sides held a handover ceremony for Chinese donations of supplies.

### Background:

- ⇒ Bhutan and China in October 2021 signed an agreement on a "Three-Step Roadmap for Expediting the Bhutan-China Boundary Negotiations". Bhutan's Foreign Ministry said then the MoU on the Three-Step Roadmap would "provide a fresh impetus to the Boundary Talks."
- ⇒ So far, 11 expert group meetings and 24 rounds of talks have been held since the process began in 1984.

### Areas of dispute:

- ⇒ Negotiations in the 24 rounds have focused broadly on two areas of dispute – Doklam and areas along the western borders of Bhutan and near the India-China-Bhutan trijunction, and the Jakarlung and Pasamlung valleys along Bhutan's northern borders.
- ⇒ However, China has recently appeared to broaden the scope of the dispute by also bringing in areas along Bhutan's eastern borders in Sakteng wildlife sanctuary, which borders India's state of Arunachal Pradesh. The Chinese Foreign Ministry subsequently referred to disputes in "western, middle and eastern" sections.
- ⇒ Some observers viewed that move as a pressure tactic to push Bhutan to accept China's earlier reported offer of a swap of Doklam in the west, which China views strategically, in exchange for Bhutan to retain its northern territories.
- ⇒ The western areas, measuring 269 sq km, are a particularly sensitive bone of contention given the proximity to India, especially after the 2017 stand-off between Indian and Chinese troops in Doklam. Since the stand-off, China has stepped up its military presence in the disputed plateau.
- ⇒ The Jakarlung and Pasamlung valleys along Bhutan's northern borders with Tibet measure 495 sq. km.

### Infrastructure push by China:

- ⇒ China has recently launched an infrastructure push in Tibet to build what it calls "xiaokang" (moderately prosperous) frontier villages, to establish civilian settlements in areas, including disputed ones, along the Tibet-Bhutan border.

## G20 INFRA WORKING GROUP DISCUSSES HOW TO MAKE CITIES SUSTAINABLE, RESILIENT



**Why in news?**

- Making cities sustainable, resilient, inclusive and how to plan these mega urban centres with a people-centric approach and meet their financial needs have been among the major themes discussed by delegates at a two-day meeting of the G20 Infrastructure Working Group (IWG).

**Details:**

- The first IWG meeting under the aegis of G20, whose presidency is currently with India, was attended by 64 delegates from 18 member countries, eight guest nations and as many international organisations.
- It discussed the '2023 Infrastructure Agenda' under the Indian G20 presidency.

**Key Highlights:**

- There major areas include making cities sustainable, resilient, inclusive and financing needs of cities.
- The funding options are government, private and multi-lateral funding and there are various innovative financing mechanisms that are evolving like land value capture.
- The key concerns for all the cities globally are the rapid pace of urbanisation and climate change. Reduction of carbon emission and moving to net-zero was a major theme around which many discussions were held.
- As per the United Nations, net zero means cutting greenhouse gas emissions to as close to zero as possible, with any remaining emissions re-absorbed from the atmosphere, by oceans and forests for instance.

**What's next?**

- The second meeting of the IWG is scheduled to be held in Vishakhapatnam, Andhra Pradesh, from March 28-29.

**About G20:**

- The G20 or Group of 20 is an intergovernmental forum of the world's major developed and developing economies.
- It comprises Argentina, Australia, Brazil, Canada, China, France, Germany, India, Italy, Indonesia, Japan, South Korea, Mexico, Russia, Saudi Arabia, South Africa, Turkey, the UK, the US and the European Union (EU).

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## INDIA NOTIFIES PAKISTAN ON "MODIFICATION" OF INDUS WATERS TREATY

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**Why in news?**

- In a significant development, India has cited Pakistan's persistent objections regarding Kishenganga and Ratle hydropower projects in Kashmir and issued a notice to Pakistan announcing "modification" of the 63-year-old Indus Waters Treaty (IWT).
- The notice was sent to Pakistan, through Commissioners for Indus Waters.

**Objective:**

- The objective of the notice for modification is to provide Pakistan an opportunity to initiate "intergovernmental negotiations" within 90 days regarding the differences that the Indian side has described as a "material breach".

**Background:**

- It was argued that a dispute in the IWT has been brewing since 2015 when Pakistan asked for the appointment of a "Neutral Expert" to probe its "technical objections" to India's Kishenganga and Ratle Hydro Electricity Projects.
- In 2016, Pakistan changed that request and proposed that a Court of Arbitration should examine the objections.
- In response, India sought the appointment of a Neutral Expert. The two processes would be contradictory and be "legally untenable".

**India's response:**

- The Indian side has alleged that by unilaterally changing the request from seeking a "Neutral Expert" to a "Court of Arbitration", Pakistan has violated the Indus Waters Treaty which has been further complicated by the World Bank recently moving to act on both Neutral Expert and Court of Arbitration.
- Such parallel considerations on the same issues is not covered under any provision of IWT.

**Indus Waters Treaty:**

- The Indus Waters Treaty was signed in 1960 between India and Pakistan and is often cited as one of the most successful international treaties in South Asia which has endured wars and tension between India and Pakistan.
- The treaty lays down terms of distribution of the waters of the Indus and its tributaries that support agriculture and other economic activities of both north India and Pakistan.
- It allocated the three western rivers; Indus, Chenab and Jhelum to Pakistan for unrestricted use, barring certain non-consumptive, agricultural and domestic uses by India and the three Eastern Rivers; Ravi, Beas and Sutlej were allocated to India for unrestricted usage.

## CHINA BUILDS NEW DAM IN TIBET NEAR INDIAN BORDER



### Why in news?

- In a development that is a matter of concern to both India and Nepal, China is constructing a new dam on the Mabja Zangbo River in Tibet, close to the tri-junction, satellite imagery has revealed.
- The new dam is located around 16 km north of the tri-junction and is opposite the Kalapani area of Uttarakhand.

### Details:

- The satellite images show the activity since May 2021 in the Burang county of Tibet that shares its border with Nepal.
- The images show the formation of an embankment type dam with a reservoir.

### Related concerns:

- In addition to using water as leverage, the possibility of a military establishment by China near the tri-junction cannot be ruled out as the country had developed the same in the Yarlung Zangbo river near Arunachal Pradesh.
- China could use this dam to not only divert but also store water which could lead to a scarcity in the regions dependent on the Mabja Zangbo river as also lead to lower water levels in rivers such as the Ghaghara and the Karnali in Nepal.
- Dams close to the border could be used by China to strengthen its claim on the disputed areas in the region.

### China's hydro project:

- In 2021, China announced that it would construct a massive dam on the lower reaches of Yarlung Zangbo to generate up to 70 GW of power, three times that of the country's Three Gorges dam, which is the world's largest hydropower plant in terms of installed capacity.
- This was among several other hydropower projects announced by China to generate clean energy and achieve carbon neutrality by 2060.

### Mabja Zangbo:

- Mabja Zangbo originates in Nagari county of Tibet, flows through Nepal into the Ghaghara river before joining the Ganga in India.

### Yarlung Zangbo:

- The Yarlung Zangbo, as the Brahmaputra is known in Tibet, originates in the Himalayas in Tibet, enters India in Arunachal Pradesh, passes through Assam and then Bangladesh before emptying into the Bay of Bengal.

## ECONOMY

## CCEA APPROVES RS 2,539 CRORE BIND SCHEME FOR MODERNISING DOORDARSHAN, AIR



### Why in news?

- The Cabinet Committee on Economic Affairs (CCEA) approved a scheme worth Rs 2,539.61 crore for Doordarshan (DD) and All India Radio (AIR), in a boost to public sector broadcasting in the country.

### BIND Scheme:

- The investment, announced under the Central Sector 'Broadcasting Infrastructure and Network Development (BIND)' scheme, will be up to 2025-26 and will aim to modernise the two entities run by Prasar Bharati.
- It is also the largest investment outlay by the government for the two public broadcasters under the BIND scheme.
- The BIND scheme is the vehicle for providing financial support to Prasar Bharati for expenses related to expansion and upgrade of its broadcasting infrastructure, content development and civil work related to the organisation.
- Prasar Bharati, as the public broadcaster of the country, is the most important vehicle of information, education, entertainment and engagement for the people, especially in remote areas of the country, through DD and AIR.

### High-quality content:

- Another priority area of the scheme would be the development of high-quality content for both domestic and international audiences and ensuring availability of diverse content to viewers by upgrade of capacity of DD FreeDish, the free-to-air DTH platform run by Prasar Bharati, to accommodate more channels.

- Purchase of OB vans and digital upgradation of DD and AIR studios to make them high-definition-ready would also be done as part of the project.

**Way Forward:**

- The BIND scheme would enable the public broadcaster to undertake major upgrade of its facilities across the country.

**PEPSICO FOUNDATION, CARE BRING GLOBAL WOMEN FARMER PROGRAMME TO BENGAL**



**Why in news?**

- Recently, PepsiCo Foundation and CARE announced the expansion of their global ‘She Feeds the World’ programme to India in West Bengal, home to the company’s first food factory in the country.

**Focus:**

- The programme ‘She Feeds the World’ focuses on strengthening the role of small-scale women producers across three dimensions: economic, social and environmental.
- At the economic level, it would build capabilities for the small-scale farmers; socially, the project aims to promote equitable access to knowledge, resources and inclusive markets and from an environmental perspective, it would tackle soil, water, biodiversity and carbon footprint issues.

**Status:**

- Through an \$18 million, five-year global partnership between the PepsiCo Foundation and CARE International, ‘She Feeds the World’ is already supporting female farmers in Egypt, Uganda, Peru, Thailand and Vietnam.
- In India, it aims to reach more than more than 48,000 women, men and children and indirectly benefit 1,500,000 individuals in West Bengal.

**PepsiCo India:**

- PepsiCo, which set up its factory in West Bengal 2004, already has a track record of engaging with women in the state as part of the PepsiCo-USAID Women Farmer Economic Empowerment Program.
- With the help of this initiative, PepsiCo has trained over 1,500 women farmers since 2019 on potato agronomy and sustainability; seven women’s groups piloted a shared land-lease programme.

- It is expected that the programme will impact more than 300,000 women through direct and community engagement.

**Way Forward:**

- PepsiCo in India works with over 27,000 farmers in 14 states in the country and out of these over 65 per cent (17,500) of farmers were from West Bengal.
- West Bengal has about 96 per cent small and marginal farmers with small landholding. The next state where the women farmer economic empowerment programme could be rolled out is Uttar Pradesh.

**DEFENCE**

**GOVERNMENT STARTS PROCESS TO BUY 100 MORE K9-VAJRAS**



**Why in news?**

- The Defence Ministry has started the process for the procurement of 100 more K9-Vajra tracked self-propelled howitzers.
- They are built in India by Larsen & Toubro (L&T) using technology transferred from South Korean defence major Hanwha Defense Co. Ltd.

**Background:**

- At the height of tensions in eastern Ladakh in 2020, the Army deployed a regiment of these howitzers to augment its long-range fire power against the backdrop of a massive build-up of forces by China across the Line of Actual Control.
- The induction of Dhanush, K9-Vajra and M777 Ultra-Light Howitzers has enhanced the reach of artillery firepower on the northern borders.
- The 100th gun was delivered to the Army in February 2021, the contract for which was signed in May 2017. The contract involved maintenance transfer of technology to an Army base workshop to support the howitzers throughout their operational life cycle.

**About K9-Vajra:**

- The K9-Vajra is a 155-mm, 52-calibre tracked self-propelled howitzer based on the K9 Thunder built by Hanwha Defense.
- The K9-Vajra was mainly bought for use in deserts, but the stand-off prompted them to be deployed in the mountains as well.

### UK VESSEL HMS TAMAR DOCKS AT ANDAMAN & NICOBAR ISLANDS, CREW TO CONDUCT EXERCISE WITH INDIAN NAVY



#### Why in news?

- The United Kingdom's HMS Tamar, an offshore patrol vessel of the Royal Navy, docked at the strategic Andaman and Nicobar Islands as part of its permanent deployment in the Indo-Pacific region.
- The ship and her crew will undertake capability demonstrations and maritime exercises with the Indian Navy.

#### Details:

- The ship's visit to India is an opportunity to further strengthen the shared maritime domain awareness effort, and underlines the UK's and India's intent to collaborate in the Indian Ocean Region and wider Indo-Pacific.
- As part of an Integrated Review of the United Kingdom in 2021, the Indo-Pacific region has been given a specific focus.
- This focus has often been described as a 'Tilt to the Indo-Pacific' by Great Britain.

#### HMS Tamar:

- The HMS Tamar is a river-class offshore patrol vessel of the Royal Navy that has been deployed in the Indo-Pacific since September 2021.
- It has been named after the Tamar River in England.
- It is the fourth of five new vessels that have been deployed to replace the existing river class vessels.
- The HMS Tamar has a top speed of 20+ knots, can accommodate a maximum crew of 60, and has a range of 5,500 nautical miles.

#### What's next?

- As set out in the Integrated Review, there will now be two Royal Navy vessels permanently deployed in the Indo-Pacific region.
- The HMS Tamar is one of the two vessels that are supposed to be in the region.
- The other is the HMS Spey, which has also been deployed in the Indo-Pacific since September 2021.

### VSHORAD MISSILE SYSTEM



#### Why in news?

- The Defence Acquisition Council (DAC) accorded Acceptance of Necessity (AoN) to procure the Very Short Range Air Defence System or VSHORAD (IR Homing) missile system, among other weapon systems for the Army and Navy at a total cost of Rs. 4,276 crore.
- The development comes amid the ongoing military standoff with China at the LAC in eastern Ladakh and reports of air violations by China along the LAC in 2022.

#### What is the missile system?

- Meant to kill low altitude aerial threats at short ranges, VSHORADS is a man portable Air Defence System (MANPAD) designed and developed indigenously by DRDO's Research Centre Imarat (RCI), Hyderabad, in collaboration with other DRDO laboratories and Indian Industry Partners.
- The DRDO, in September 2022, conducted two successful test flights of the VSHORADS missile from a ground based portable launcher at the Integrated Test Range, Chandipur, off the coast of Odisha.
- The missile which is propelled by a dual thrust solid motor incorporates many novel technologies including miniaturised Reaction Control System (RCS) and integrated avionics.

#### How will it help India?

- Being man portable and lightweight compared to the other missile systems in the Army's armoury, it can be deployed in the mountains close to the LAC at a short notice.
- Others like the Akash Short Range Surface to Air Missile System are heavier with a theatre air defence umbrella of up to 25 km and can be deployed further away from the LAC for static formations.
- When inducted, they will be a critical air defence missile for the forces, even for an all-equipped infantry unit, and will be the best option for mountain warfare.

## 21ST EDITION OF INDIA FRANCE BILATERAL NAVAL EXERCISE 'VARUNA' – 2023



### Why in news?

- The 21st Edition of the Bilateral Naval Exercise between India and France – Exercise Varuna commenced on the Western Seaboard recently.

### About 'Exercise Varuna':

- While the bilateral exercise between the two navies were initiated in 1993, it was christened as 'VARUNA' in 2001 and has become a hallmark of India – France strategic bilateral relationship.

### Key Highlights:

- This edition will witness participation of indigenous guided missile stealth destroyer INS Chennai, guided missile frigate INS Teg, maritime patrol aircraft P-8I and Dornier, integral helicopters and MiG29K fighter aircraft.
- The French Navy will be represented by the aircraft carrier Charles De Gaulle, frigates FS Forbin and Provence, support vessel FS Marne and maritime patrol aircraft Atlantique.
- The exercise will witness advanced air defence exercises, tactical manoeuvres, surface firings, underway replenishment and other maritime operations.
- Units of both navies will endeavour to hone their war-fighting skills in maritime theatre, enhance their inter-operability to undertake multi-discipline operations in the maritime domain and demonstrate their ability as an integrated force to promote peace, security and stability in the region.

### Way Foreword:

- Having grown in scope and complexity over the years, this exercise provides an opportunity to learn from each other's best practices.
- The exercise facilitates operational level interaction between the two navies to foster mutual cooperation for good order at sea, underscoring the shared commitment of both nations to security, safety and freedom of the global maritime commons.

## IAF'S MI-17 HELICOPTERS TO BECOME MORE LETHAL, WILL GET MADE-IN-INDIA ARMOUR



### Why in news?

- The Mi-17 helicopters of the Indian Air Force (IAF) are going through a 'desi' makeover.

### Details:

- The IAF will now equip its Mi-17 helicopters with indigenous armour that will improve their ability to withstand fire from small arms and snipers.
- This will enable these helicopters to perform better in operations involving close-quarters combat.
- This is part of the Atmanirbhar Bharat initiative of the Indian government which aims to boost indigenous industry, including the defence sector.

### Made-in-India armour plates:

- The made-in-India armour plates are 40 percent lighter than those imported from Russia.
- Unlike the earlier variants of the Mi-17 helicopter, the latest version – the V5 – comes with Russian clip on, clip off armour.
- However, the indigenous clip on, clip off armour, that are being manufactured by the government-run Mishra Dhatu Nigam Limited (MIDHANI) is much lighter and durable than the armour from Russia.

### Mi-17 helicopters:

- At present, the IAF has a fleet of about 250 Mi-17 helicopters. These Russian helicopters have the ability to carry up to 36 soldiers in full combat gear.
- Hindustan Aeronautics Limited (HAL) is in the process of coming up with an indigenous medium weight military helicopter that will eventually replace the Mi-17 V5.

## INAUGURAL EDITION OF INDO-EGYPT JOINT TRAINING EXERCISE CYCLONE - I COMMENCES IN RAJASTHAN

### Why in news?

- The first ever joint exercise between the special forces of the Indian Army and the Egyptian Army named "Exercise Cyclone-I" is in progress at Jaisalmer in Rajasthan since 14 January 2023.

**Aim:**

- The exercise aims to bolster defence co-operation between the two nations and focus on sharing professional skills and interoperability of Special Forces in desert terrain while undertaking counter terrorism, reconnaissance, raids and other special operations.
- Exercise "Cyclone - I" is the first exercise of its kind bringing the special forces of both the nations on a common platform.

**Key Highlights:**

- The 14 days long exercise which is being carried out in the deserts of Rajasthan engages both the contingents to advance special forces skills such as Sniping, Combat Free Fall, Reconnaissance, Surveillance & Target Designation, sharing of information on weapons, equipment, innovations, tactics, techniques & procedures.
- The participants would also undertake joint planning and drills for Special Forces operations in a mechanised warfare setting as well as surgical strikes on terrorist camps/hideouts to include sniping of High Value Targets.

**Way Forward:**

- The joint exercise would provide an insight into the culture and ethos of both armies thereby fostering military cooperation and interoperability to further strengthen the diplomatic relations between India and Egypt.

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### VAGIR: ALL ABOUT THE KALVARI CLASS SUBMARINE COMMISSIONED BY INDIAN NAVY

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**Why in news?**

- The Indian Navy is set to commission the fifth scorpene-class submarine Vagir.
- The commissioning of the submarine, built under the Project-75, is set to encourage the Navy's combat capability at a time when China has been increasing its presence in the Indian Ocean region.

**Project-75:**

- The Project-75 includes indigenous construction of six submarines of Scorpene design.
- The submarines are being constructed at Mazagon Dock Shipbuilders Limited (MDL), Mumbai under a collaboration with the Naval Group of France.
- Four Submarines of the ongoing Project-75 Scorpene programme at MDL, Kalvari, Khanderi, Karanj and Vela have been commissioned into the Indian Navy.
- The fifth submarine Vagir is being commissioned today, whilst the sixth and last submarine 'Vagsheer' will also undergo sea trials after launching.

**Vagir:**

- The erstwhile Vagir was commissioned on November 1, 1973 and undertook numerous operational missions including deterrent patrols. The submarine was decommissioned in January 2001 after serving the nation for about three decades.
- Scorpene submarines can undertake various types of missions i.e anti-surface warfare, anti-submarine warfare, intelligence gathering, mine laying, area surveillance etc.
- The Scorpene submarines are extremely potent platforms. They have advanced stealth features and are also equipped with long range guided torpedoes as well as anti-ship missiles. They also have a state of the art SONAR and sensor suite permitting outstanding operational capabilities.
- In addition, they also have advanced Permanent Magnetic Synchronous motor (PERMASYN) as its propulsion motor.
- The submarine is designed to operate in all theatres of operation, showcasing interoperability with other components of a Naval Task Force. It is a potent platform, marking a transformational shift in submarine operations.

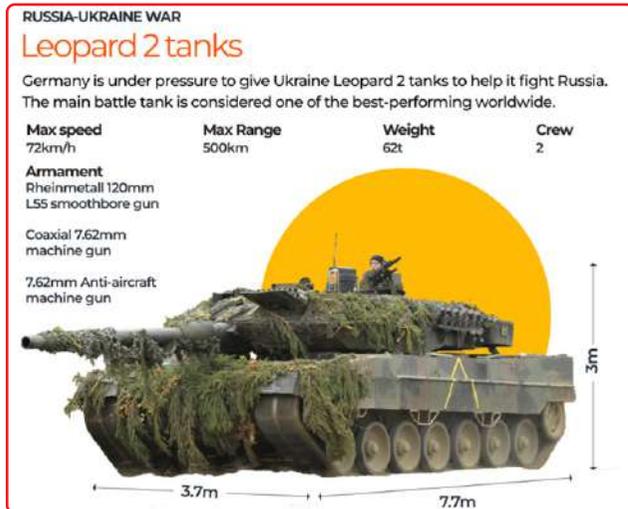
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### WHAT IS THE LEOPARD 2 TANK, AND HOW COULD IT HELP UKRAINE AGAINST RUSSIA?

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**Why in news?**

- Germany is under intense pressure to provide Ukraine with its Leopard 2 tanks, which could have a significant impact against the Russian invasion.
- European allies have already sent hundreds of modernised Soviet tanks to Ukraine since the war started nearly 11 months ago. But Ukraine has pleaded for more advanced military equipment to get the upper hand in the fight against Russia.



- Germany has not decided whether to allow its Leopard 2 tanks to be sent to Ukraine, U.S. Defense Secretary Lloyd Austin said after a U.S.-led meeting of Ukraine's allies ended with no consensus.

**What is a Leopard 2 tank?**

- The Leopard 2 is one of the world's leading battle tanks, used by the German Army for decades and by the militaries of more than a dozen other European nations, as well as by the armies of countries as far apart as Canada and Indonesia. It has seen service in conflicts in Afghanistan, Kosovo and Syria.
- The tank, which is powered by a diesel engine, features night-vision equipment and a laser range finder that can measure distance to an object, enabling it to better aim at a moving target while traveling over rough terrain.
- There are multiple iterations of the Leopard 2 with different features and designs.

**How could the tank help Ukraine?**

- Until now, both Ukraine and Russia have used Soviet-era tanks in battle, and the Leopards would offer a big step forward in capability.
- Ukraine's government has been calling for tanks on top of earlier packages of military aid from allies in the United States and Europe that included aircraft, air defense systems to protect against Russian missile and drone attacks and longer-range artillery.
- Supplies of the Leopard 2 would help offset Russia's superiority in artillery firepower, which aided Moscow in seizing two cities in eastern Ukraine's Luhansk province over the summer.
- They could be of particular value as the war approaches its second year and Ukraine looks to reclaim lost territory and expects a Russian spring offensive.

**What are the advantages of Leopards over other tanks?**

- Britain has promised to supply Ukraine with 14 of its Challenger 2 tanks, and U.S. planned to supply

nearly 100 Stryker combat vehicles, though it has not committed to sending American-made M1 Abrams tanks, which require constant upkeep and generally run on special fuel.

- The chief advantage of the Leopard 2 was the quantity that could be sent to Ukraine and the relative ease of repair and logistics.
- In addition, because several European countries use the vehicles, multiple nations could contribute either the tanks themselves, or spare parts, training capacity or logistics.

**Why does Germany have to approve the transfer of Leopards owned by other countries?**

- Re-exporting German-made tanks without its permission would be illegal.
- The contracts that a country signs to obtain weapons from German manufacturers or German military stocks require them to request a re-export license from the federal government should they wish to send such weapons to another country.
- The United States has similar requirements, as do other countries, including Switzerland.

**TROPEX-23**



**Why in news?**

- The 2023 edition of Indian Navy's major maritime exercise TROPEX, is currently underway in the Indian Ocean Region.

**Participants:**

- This operational level exercise is conducted biennially and witnesses participation not only by all Indian Navy units but also of Indian Army, Indian Air Force and Coast Guard assets.

**Key Highlights:**

- TROPEX 23 is being conducted over a duration of three months from Jan - Mar 23.
- As part of the exercise, all surface combatants of the Indian Navy including Destroyers, Frigates, Corvettes as well as submarines and aircraft are put through complex maritime operational deployments to validate and refine the Navy's Concept of Operations including operational logistics and interoperability with other Services.

- The exercise is being conducted in different phases, both in harbour and at sea, encompassing various facets of combat operations, including live weapon firings.

#### Significance:

- Having grown in scope and complexity over the years, this exercise provides an opportunity to test the combat readiness of the combined Fleets of the Indian Navy to operate in a multi-threat environment.
- The maritime exercise also facilitates operational level interaction with the Indian Army, Indian Air Force and the Coast Guard, which will further strengthen interoperability and joint operations in a complex environment.

### TRI-SERVICES AMPHIBIOUS EXERCISE, AMPHEX 2023 CONCLUDES



#### Why in news?

- The biennial Tri-Services Amphibious Exercise, AMPHEX 2023 was conducted at Kakinada, Andhra Pradesh recently.

#### Details:

- AMPHEX is aimed at joint training of elements of all three services in various facets of amphibious operations to enhance interoperability and synergy.
- AMPHEX 23 is the first time that the exercise was undertaken at Kakinada, and was the largest ever AMPHEX conducted till date.

#### Key Highlights:

- The participating forces undertook complex exercises in all domains of amphibious operations over five days.
- The exercise witnessed the participation of a number of amphibious ships consisting of Large Platform Dock (LPD), Landing Ships and Landing Crafts, Marine Commandos (MARCOS), helicopters and aircraft from the Indian Navy.
- Indian Army participated in the exercise with over 900 troops which included Special Forces, Artillery and Armoured vehicles. Jaguar fighters and C 130 aircraft from the IAF also participated in the exercise.

#### Way Forward:

- AMPHEX 2023 successfully demonstrated the

amphibious capabilities and validated the excellent coordination that exists between the three Services to undertake the full spectrum of amphibious operations.

### IAF JOINT AIR DEFENCE EXERCISE WITH JAPAN VEER GUARDIAN 2023 CONCLUDES



#### Why in news

- The inaugural edition of the bilateral air exercise 'Veer Guardian 2023' between the Indian Air Force (IAF) and Japan Air Self Defence Force (JASDF) concluded in Japan recently.

#### Background

- The two countries agreed to step up bilateral defence cooperation and engage in more military exercises during the second 2+2 Foreign and Defence Ministerial meeting held in Tokyo on September 8, 2022

#### Key Highlights

- The JASDF participated in the exercise with its F-2 and F-15 aircraft, while the IAF contingent participated with the Su-30 MKI aircraft.
- The IAF fighter contingent was complemented by one IL-78 Flight Refueling Aircraft and two C-17 Globemaster strategic airlift transport aircraft.
- During the joint training spanning 16 days, the two Air Forces engaged in complex and comprehensive aerial manoeuvres in multiple simulated operational scenarios. The exercise involved precise planning and skillful execution by both the air forces.
- IAF and JASDF engaged in air combat manoeuvring, interception and air defence missions, both in Visual and Beyond Visual Range settings. Aircrew of the two participating Air Forces also flew in each other's fighter aircraft to gain a deeper understanding of each other's operating philosophies.

#### Way Forward

- Exercise 'Veer Guardian 2023' provided the two Air Forces with an opportunity to enhance mutual understanding.
- This enabled the participating contingents to obtain an invaluable insight into each other's best practices and learn from each other's unique capabilities.

## ENVIRONMENT

### SUSTAINABLE SHRIMP CULTIVATION PROVIDES HOPE FOR MANGROVE RESTORATION IN SUNDARBANS



#### Why in news?

- A new initiative of sustainable shrimp cultivation provides hope for mangrove restoration in Sundarbans.
- For several years, environmentalists and experts have expressed concerns over unsustainable aquaculture, particularly shrimp collection, after cleaning large tracts of mangrove forests in Sunderbans.

#### SAIME:

- Under the initiative, Sustainable Aquaculture In Mangrove Ecosystem (SAIME), farmers have taken up cultivation of shrimp at 20 hectares at Chaital in West Bengal's North 24 Parganas, and 10 hectares at Madhabpur in adjoining South 24 Parganas. However, they are doing their part in restoring the mangroves as well.
- A research program on the contribution of mangrove leaf litter in the nutritional dynamics in SAIME ponds has been initiated in collaboration with the Centre for Excellence in Blue Economy (CoE-BE) of the Indian Institute of Science Education and Research (IISER), Kolkata.
- The initiative started in 2019 has established a collaborative ecosystem integrating several key stakeholders from government departments, academia, and research institutes for co-creation and comprehensive advancement of this project.
- Shrimp cultivation is integrated into the mangrove ecosystem but when people extended the fisheries inwards, they excluded the mangroves.

#### Outcome:

- This pilot project has come out with a significant result in the last three years' span, providing a per hectare average yield of fishes and shrimps amounting to 535 kg, out of which shrimp amounts average 275 kg (black tiger shrimp-200 kg and with freshwater giant prawn-75 kg).

- The rate of survival of planted mangrove saplings, which is usually 5-10%, has ranged between 30-50% in the initiative.

#### Shrimp cultivation:

- Fishing, particularly shrimp cultivation, is one of the key occupations of the people of Sundarbans, which is a complex network of rivers and low-lying islands that face a tide surge twice a day.
- Shrimp cultivation is practised in about 15,000 to 20,000 hectares of the unique ecosystem in India. The Sundarbans forest is about 10,000 sq. km across India and Bangladesh, of which 40% lies in India.
- There are 42 shrimp farmers engaged in the pilot project and a majority of them say that they have had higher incomes compared to previous years.
- They are also cultivating indigenous varieties of shrimps such as black tiger shrimp (*P. monodon*) and giant freshwater prawn (*M. rosenbergii*).

### NTPC STARTS INDIA'S FIRST GREEN HYDROGEN BLENDING OPERATION IN PNG NETWORK



#### Why in news?

- NTPC Ltd commissions India's first green hydrogen blending project.
- The green hydrogen blending has been started in the piped natural gas (PNG) network of NTPC Kawas township, Surat.
- The project is a joint effort of NTPC and Gujarat Gas Limited (GGL).

#### Background:

- NTPC and GGL have worked relentlessly towards achieving this milestone in record time after the foundation stone laying by the Prime Minister of India on 30th July 2022.

#### Details:

- This set-up is geared up to supply H<sub>2</sub>-NG (natural gas) to households of Kawas township at Adityanagar, Surat.
- Green hydrogen in Kawas is made by electrolysis of water using power from already installed 1 MW floating solar project.
- Petroleum and Natural Gas Regulatory Board (PNGRB), the regulatory body has given approval for

5% vol./vol. blending of green hydrogen with PNG to start with and the blending level would be scaled phase wise to reach 20%.

- Green hydrogen when blended with natural gas reduces CO2 emissions keeping net heating content same.

#### Way Forward:

- This feat is achieved only by few select countries like UK, Germany, and Australia etc. This would bring India at the centre stage of the global hydrogen economy.
- India would not only reduce its hydrocarbon import bill significantly but can also bring forex ashore by being a green hydrogen and green chemicals exporter to the world.

### INDIA IDENTIFIES COPPER AND LITHIUM MINES IN ARGENTINA



#### Why in news?

- India has identified two lithium mines and one copper mine in Argentina, and it may acquire or lease them soon. In November 2022, the Indian government sent a team of geologists to South America to 'assess potential lithium deposits'.

#### Details:

- The ownership or leasing rights of the mines will be with Khanij Bidesh India Ltd (Kabil). It is a joint venture of the National Aluminium Company (Nalco), Hindustan Copper (HCL) and Mineral Exploration Corporation Ltd (MECL).
- It was formed in 2019 to ensure the supply of strategic minerals in India's market.

#### Lithium reserves:

- Argentina is the fourth largest producer of lithium. It also has the third-largest reserve of the mineral in the world.
- Lithium is widely used in manufacturing batteries and other electronic products.
- Australia, US and China are the other major producers of the mineral.

#### Background:

- Kabil expressed interest in partnering with Argentina-based Camyen to prospect two areas for extracting lithium.

- Kabil also signed three agreements with Argentina government-run companies JEMSE, Camyen and YPF between July and September 2020 to explore sourcing of lithium and other mineral assets in the South American country.

#### What's next?

- Kabil is also reportedly in the process of hunting joint lithium mining projects in Chile.
- In March, the JV under the mines ministry signed a memorandum of understanding with the Department of Industry, Science and Resources, Australia, for joint investment in lithium and cobalt assets in that country.

### WHY IS SOUTHERN HEMISPHERE HIT BY SO MANY STORMS?



#### Why in news?

- The Southern Hemisphere was rocked by some of the devastating storms in 2022 that raged up to category 4. The region is about 24 per cent stormier than the Northern Hemisphere, but until now no one knew why. Scientists have now found the answer.

#### Key Findings:

- Researchers at the University of Chicago have found that the ocean circulation and the large mountain ranges in the Northern Hemisphere are the big triggers that make the Southern Hemisphere prime to be hit by storms and cyclones on an annual basis.
- They also found that this storminess asymmetry has increased since the beginning of the satellite era in the 1980s.
- The findings indicate that the increase in storminess is consistent with climate change forecasts from physics-based models. Researchers said that consistently, the Southern Hemisphere has a stronger jet stream and more extreme weather events than the Northern Hemisphere.
- They also observed that the Southern Hemisphere is getting even stormier, whereas the change on average in the Northern Hemisphere has been negligible. The Southern Hemisphere's storminess changes were connected to changes in the ocean.

**Approach:**

- They tested the topographic parameters and found that large mountain ranges, which are more in the Northern Hemisphere, disrupt airflow in a way that reduces storms in the region.
- To test the theory, they flattened every mountain on Earth in the numerical model, and about half the difference in storminess between the two hemispheres disappeared.
- They then moved to water circulation as it creates the energy difference between the two hemispheres. As they eliminated this conveyor belt, they saw the other half of the difference in storminess disappear.

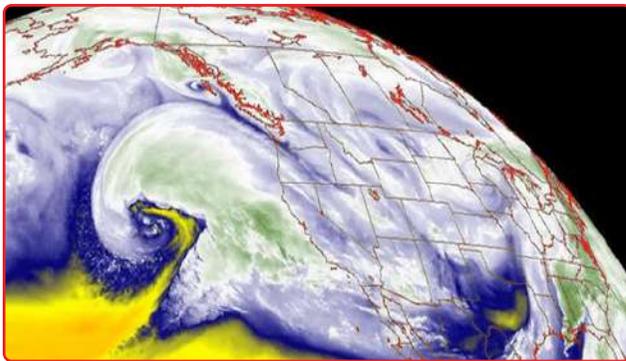
**Background:**

- Hurricane Ian became the worst tropical storm to hit the Southern Hemisphere in 2022. The storm hammered Florida with such ferocity that it wiped out whole neighborhoods, tossed boats onto highways, swept away beaches, and swamped homes in roof-deep waters.
- It killed more than 100 people, the majority of victims in Florida, making it the third-deadliest storm to hit the U.S. mainland this century.

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### WHAT IS ATMOSPHERIC RIVER THAT IS DRIVING HEAVY RAINS, FLOODS TO US?

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**Why in news?**

- As the bomb cyclone slowed down in the US, high winds and torrential rains are sweeping California, renewing the threat of power outages and deadly flooding that gripped parts of San Francisco Bay and Sacramento.
- The condition is being driven by a phenomenon known as an atmospheric river.

**What is an Atmospheric River?**

- The atmospheric river is a long, narrow region in the atmosphere that is like rivers in the sky. These atmospheric rivers transport water vapor outside of the tropics that move with the weather, carrying an amount roughly equivalent to the average flow of water at the mouth of the Mississippi River.
- When these atmospheric rivers move inland and sweep over mountains, the water vapour rises and

cools to create heavy precipitation. This water is then deposited on the surface in the form of heavy rain and snow as it makes landfall.

- Scientists have said that some of these atmospheric rivers contain the largest amounts of water vapor and the strongest winds can create extreme rainfall and floods, often by stalling over watersheds vulnerable to flooding. Most of these systems are generally weak and serve as water replenishment for the surface.

**Weather Predictions:**

- The authorities have posted high-wind warnings along the central California coast north through the Bay area and into extreme northern California and Oregon.
- The National Weather Service (NWS) said gale-force gusts were expected to uproot trees, shear off limbs, and knock down power lines, disrupting electricity service in many areas.

**About Bomb Cyclone:**

- A bomb cyclone is a large, intense midlatitude storm that has low pressure at its center, weather fronts and an array of associated weather, from blizzards to severe thunderstorms to heavy precipitation.
- Bomb cyclones put forecasters on high alert because they can produce significant harmful impacts.
- Storms form when a mass of low-pressure air (warm air mass) meets a high-pressure mass (cold air mass). The air flows from high pressure to low, creating winds.
- It occurs when a midlatitude cyclone rapidly intensifies, dropping at least 24 millibars over 24 hours.

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### TIRUPATI TO HAVE LARGEST LIQUID WASTE TREATMENT PLANT

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**Why in news?**

- The Municipal Corporation of Tirupati (MCT) is set to take a giant leap in water treatment by putting in place what is claimed to be the country's largest liquid waste treatment plant to use phytoid technology.

**Details:**

- The plant coming up next to Vinayaka Sagar will treat 5 MLD (million litres a day).

- Sewage from the MCT's seven adjoining divisions used to flow into the waterbody in the past, by way of gravity. With the advent of this plant, the water will now be treated before being let into the tank.
- The project is developed at a capital expenditure of ₹11 crore under Smart City funds, and involving an operational expenditure of ₹3 crore.

### Phytorid technology:

- The phytorid technology is developed by the CSIR's National Environmental Engineering Research Institute (NEERI).
- After the waste water is treated under sedimentation process to eliminate solid matter, the same is made to flow in a serpentine motion into a sub-surface chamber containing numerous barricades, while saplings are planted atop on a porous medium containing gravel and stones. It is here that the organic matter gets eliminated.
- Later, the water is made to pass through activated carbon filter to bring the Biochemical Oxygen Demand to 5mg, much lower than the national standard of 10mg set by the Union Ministry of Housing and Urban Affairs.

### Significance:

- The main advantage of this system is that it is cost-effective, involves no operational hassles, leaves a smaller footprint and emanates no foul odour.

## CENTRE TO SET UP MICRO-SEISMIC OBSERVATION SYSTEMS AT JOSHIMATH: MINISTER



### Why in news?

- Recently, the Centre announced that it will install micro seismic observation systems at Joshimath, the gradually sinking Himalayan town in Uttarakhand.
- Earth Sciences Minister made the announcement at the India-UK Workshop of Geosciences.

### Why it matters?

- There was a critical need for fundamental research on the physical processes that lead to failure of the brittle layers beneath the crust and sub-crust.
- The human consequences of natural disasters in India were rising rapidly and stressed on the need to devise proper mitigation strategies.

### Case of Joshimath:

- The seismic microzonation study for the area would generate risk resilient parameters for safer dwellings and infrastructure.
- They said Joshimath falls under the highest seismic hazard Zone V as it experiences continuous seismogenic stresses.
- Seismic energy generation due to micro-earthquakes may have weakened the strength of the rocks as Joshimath is located in the earthquake rupture zone of the 1999 Chamoli earthquake.
- Climatic factors such as excessive precipitation and flow of water from mountains into massive cracks and fractures in the sub-surface rocks lead to widening of cracks and hastening the slip in rock material.

### Way Forward:

- The scientific understanding of the processes behind disasters has grown immensely over the past 50 years, and there is a need for strengthening further international collaborations like the Indo-UK initiative to fight such disasters.
- The Ministry of Earth Sciences had established 37 new seismological centres in the last two years for extensive observation facilities, generating a huge database for outcome-oriented analytics.
- In the next five years, 100 more such seismological centres will be opened across the country for improving real time data monitoring and data collection.

## GREENKO GROUP TO SET UP PUMPED STORAGE PROJECT IN MP'S NEEMUCH



### Why in news?

- The Greenko Group, one of India's leading energy transition companies, will invest Rs 10,000 crores in a Pumped Storage Project (PSP) near Gandhi Sagar in Madhya Pradesh's Neemuch district.

### Key Highlights:

- The Greenko Group will set up the PSP with a daily storage capacity of 11 GWh (Gigawatt hours).
- The infirm renewable electricity stored in the PSP project during lean demand hours shall be later despatched to help meet the state's evolving peak

power demand, thus resulting in considerable cost savings.

- Besides, the PSP project shall enable MP state to meet its statutory RPO (Renewable Power Obligation) and the recently notified ESO (Energy Storage Obligation) targets.
- This project is expected to provide employment to over 4,000 people.

**Way Forward:**

- Greenko currently operates wind and solar of over 500 MW capacities, across five districts of Madhya Pradesh.
- Greenko's PSP is expected to be commissioned by December 2024 and will be connected to the ISTS (Inter-State Transmission System) network.

**CENTRE PUTS NEELAKURINJI ON THE LIST OF PROTECTED PLANTS**



**Why in news?**

- The Ministry of Environment, Forest and Climate Change (MoEF) has listed Neelakurinji (Strobilanthes kunthiana) under Schedule III of the Wildlife (Protection) Act, 1972 including it on the list of protected plants.

**Key Highlights:**

- Those who uproot or destroy the plant will invite a fine of ₹25,000 and three years imprisonment.
- The cultivation of Neelakurinji and its possession is not allowed.
- Neelakurinji was included when the Centre expanded the earlier protected list of six plant species to 19.
- As per the new order, the department will take action against those who uproot or destroy Neelakurinji in forest areas, protected areas, and national parks. The department will strictly implement the government order.

**Habitat:**

- The plant was endemic to a small stretch in the Western Ghats from the Mangaladevi hills to the Nilgiris hills.
- In the Western Ghats region, nearly 70 varieties of Neelakurinji plants have been identified.
- The most popular Neelakurinji is Strobilanthes

kunthiana that blooms once in 12 years. However, some other rare varieties of Neelakurnji are also found in the Western Ghats region.

**Recent bloom:**

- The most recent blooming of Neelakurinji was over a vast area on the Kallippara hills at Santhanpara in Idukki. An expert team had identified six varieties of the plant across the mountains.
- The Eravikulam National Park, near Munnar, is known for widespread blooming of the kurinji, with the next flowering season expected in 2030.

**ENVIRONMENT IMPACT ASSESSMENT MUST BE DONE BEFORE ALLOWING URBAN DEVELOPMENT PROJECTS: SUPREME COURT**



**Why in news?**

- The Supreme Court has urged legislators and policy experts to ensure that Environment Impact Assessment (EIA) studies are done before giving the green signal for urban development projects in India's cities.

**Background:**

- In a judgment, a Bench of Justices referred to media reports of how haphazard urban development has ruined the 'Garden City' of Bengaluru as witnessed during a major spell of rain in September 2022. The city struggled for drinking water while it lay submerged after the downpour.
- The judgment came in regard to a proposal to convert independent residential units into apartments in Chandigarh Phase 1. The court prohibited the move in order to protect the heritage status of 'Corbusian' Chandigarh.

**Key Highlights:**

- It said that the legislature, the governments and experts should put their heads together "to make necessary provisions for carrying out Environmental Impact Assessment (EIA) studies before permitting urban development".
- The apex court directed the copies of the judgment to be forwarded to the Cabinet Secretary to the Union of India and to the Chief Secretaries of all the States to take note of it.

**CDSs:**

- The judgment referred to a publication by the United Nations Environment Programme (UNEP), which underscored that more than half of the world's population was now living in urban areas.
- The publication further noted that by the year 2050, more than half of Africa and Asia's population would live in towns and cities.
- It recognised that City Development Strategies (CDSs) have shown how to integrate environmental concerns in long-term city visioning exercises.

**EIA:**

- The publication defines EIA to be an analytical process or procedure that systematically examines the possible environmental consequences of the implementation of a given activity (project).
- It is aimed to ensure that the environmental implications of decisions related to a given activity are taken into account before the decisions are made.

**EIA in India**

- EIA was introduced in India in 1978, with respect to river valley projects. Later the EIA legislation was enhanced to include other developmental sections.
- EIA comes under Notification on Environmental Impact Assessment (EIA) of developmental projects 1994 under the provisions of Environment (Protection) Act, 1986.
- Besides EIA, the Government of India under the Environment (Protection) Act 1986 issued a number of other notifications, which are related to environmental impact assessment.
- Environmental clearance or the 'go-ahead' signal is granted by the Impact Assessment Agency in the Ministry of Environment and Forests, Government of India.

**CLIMATE CHANGE ONE OF KEY CONCERNS FOR CXOS: DELOITTE SUSTAINABILITY SURVEY**

**Why in news?**

- Climate change has been ranked among the top three issues of concern by CXOs with 75 per cent of those surveyed saying that companies have increased their sustainability investments over the past year, according to the Deloitte CXO Sustainability Survey 2023.
- While globally, climate change is a bigger concern than innovation, talent, supply chain and geopolitics, it is second only to economic outlook.

**Indian CxOs:**

- In India it found climate change was a higher priority, ahead of 'economic outlook', as compared to global executives, with 57 per cent calling it a "top three priority" compared to 42 per cent of global CXOs.
- Compared to the global average, Indian CxOs are likely to report feeling more stakeholder pressure to

act from board members - 78 per cent, the government 72 per cent and shareholders 71 per cent.

- Sixty per cent of Indian CxOs rated a "just transition" to be extremely important to their organisation's sustainability efforts, as compared to 46 per cent of global executives.

- A just transition seeks to ensure that substantial benefits of transitioning to a green economy are shared widely.

**Background:**

- Deloitte surveyed 2,016 CxOs across 24 countries to gauge concerns and actions from business leaders on climate change and sustainability.

**PRESSING ISSUES FOR NEXT YEAR**

(In %)

Economic outlook	44
Climate change	42
Innovation	36
Competition for talent	34
Supply chain issues	33
Global conflicts	31

Source: Deloitte CXO Sustainability Survey 2023

**ANTS CAN'T ALTER BEHAVIOUR TO DEAL WITH WARMER CLIMATE: REPORT**



**Why in news?**

- Ants may be unable to adapt to global warming, a new study looking at their behavioural flexibility has warned.
- This leaves them highly vulnerable to impacts of climate change, as the insects could not move away from warmer sites despite costs to their well-being.

**Characteristic of ants:**

- The insects are cold-blooded creatures, also called ectotherms.
- Their body temperatures depend on external sources like sunlight. Humans (endotherms), on the other hand, maintain their body temperature without relying on the environment.

- ⇒ As ants' body temperature varies with the environment, they are thought to be highly vulnerable to climate changes.
- ⇒ Ants are often called "ecosystem's engineers". These insects move the soil during nest-building and foraging, affecting the level of nutrients in it.

**Latest research:**

- ⇒ The researchers chose five ant species. They measured air temperatures at collection sites in the forests and used a special thermometer to record the insects' temperatures. Some ants were taken to the lab and placed in a rectangular chamber with a gradient of temperatures.
- ⇒ The ants choose a particular temperature, allowing researchers to estimate their comfortable or preferred temperature.
- ⇒ However, ants in the wild did not stay in preferred cooler environments. Instead, most species were found in warmer sites. This suggests that insects are either unaware or unable to adjust their behaviour by avoiding warmer ecosystems.

**Way Forward:**

- ⇒ The researchers only studied mild habitats that experienced moderate warming. In the future, they want to explore more extreme environments to understand if ants undergo behavioural change.
- ⇒ They also want to study the link between the ants' foraging activity and the nest. Nests are typically more insulated and are hence more protected against climate change.

**SPOT BELLIED EAGLE OWL SPOTTED IN SESHACHALAM FOREST OF ANDHRA PRADESH FOR THE FIRST TIME**



**Why in news?**

- ⇒ A wildlife team recently stumbled upon a 'Spot Bellied Eagle Owl' (Bubo Nipalensis) for the first time in Seshachalam forest, and for the third time in Andhra Pradesh.

**Key Characteristics of 'Spot Bellied Eagle Owl':**

- ⇒ The bird's habitat, found on large trees in thick forests, is spread across the Indian sub-continent.
- ⇒ But it was sighted only twice in the State earlier, and

both the times it was at Nagarjunasagar Srisailem Tiger Reserve (NSTR).

- ⇒ The bold predatory bird, measuring 20-25 inches in length and weighing between 1.5 kg and 2 kg, feeds on small rodents and lizards.
- ⇒ The bird makes a strange scream similar to humans and it is hence called the 'Ghost of the Forest' in India and 'Devil Bird' in Sri Lanka.

**Mottled Wood Owl:**

- ⇒ They also spotted a 'Mottled Wood Owl' (Strix Ocellata) last weekend in the fields abutting Chamala forest on the Tirupati-Annamayya inter-district border.

**Status:**

- ⇒ Though both are labelled as 'least concern' in terms of population stability, the development assumes significance in view of their maiden sighting in the verdant Seshachalam ranges.

**NEW PLATEAU TYPE DISCOVERED FROM MAHARASHTRA COULD PROVE TO BE A REPOSITORY OF INFORMATION TO STUDY CLIMATE CHANGE EFFECTS ON SPECIES SURVIVAL**



**Why in news?**

- ⇒ Agharkar Research Institute (ARI) in Pune, recently discovered a rare low-altitude basalt plateau in Manjare village, Thane district.
- ⇒ This is the fourth type of plateau to be identified in the region; the previous three are laterites at high and low altitudes and basalt at high altitudes.

**Why it matters?**

- ⇒ A rare low-altitude basalt plateau housing 76 species of plants and shrubs from 24 different families discovered in Thane region in the Western Ghats, can prove to be a repository of information for species interactions.
- ⇒ It can help study effects of climate change on species survival and increase awareness of the conservation needs of rock outcrops and their immense biodiversity value in the global context.

**Plateaus in the Western Ghats:**

- ⇒ The Western Ghats is one of four global biodiversity hotspots in India, and ARI in Pune has been studying

its biodiversity, particularly its rock outcrops, for a decade.

- Plateaus are dominant landscapes in the Western Ghats, significant because of the predominance of endemic species.
- They are classified as a type of rock outcrop and provides unique and challenging environment for species to adapt to. These outcrops have seasonal water availability, limited soil and nutrients, making them ideal laboratories to study the effects of climate change on species survival.
- Plateaus are thus a valuable source of insight into how species can survive in extreme conditions.

#### Significance:

- Surveying the plateau, the team documented 76 species of plants and shrubs from 24 different families.
- This is an important discovery, as the plateau shares the vegetation with the three other rock outcrops, simultaneously holding a few unique species. This gives a unique model system to study the species interactions in varying environmental conditions.
- The research highlighted the importance of the newly discovered low-level basalt plateau located in Manjare Village of Thane district in the Northern western Ghats, standing 156 m above mean sea level.

### KVIC THROUGH RE-HAB PROJECT OF THE HONEY MISSION PROGRAMME AIMS TO REDUCE ELEPHANT ATTACKS ON HUMANS AND FARMERS' CROPS



#### Why in news?

- Recently, KVIC distributed live Bee Colonies, Bee-keeping equipment and 200 Bee-Boxes to the trained beneficiaries at Sulia at Dakshina Kannada, Karnataka under the RE-HAB Project, an initiative under the Honey Mission Programme of Prime Minister.

#### Project RE-HAB:

- Under the Project RE-HAB, "Bee-fences" are created by setting up bee boxes in the passage ways of elephants to block their entrance to human habitats.
- The boxes are connected with a string so that when

elephants attempt to pass through, a tug or pull causes the bees to swarm the elephant herds and dissuade them from moving further.

- Under the RE-HAB farmers are trained in bee-keeping and each of them are supplied with 10 Bee boxes and installed in the elephant corridors so bee boxes and bee hives are placed in the Elephant corridor to restrict elephants from approaching the agricultural field.
- This project has also helped in the increasing agricultural output due to enhanced pollination as well as Honey Extraction.

#### Outcome:

- This is a cost-effective way of reducing human-wild conflicts without causing any harm to the animal.
- It is scientifically recorded that elephants fear the bee swarms that can bite their sensitive inner side of the trunk and eyes. The collective buzz of the bees annoys elephants which force them to return.

#### Implementation:

- It was seen that Bees help the farmers in arresting the encroachment of elephants in their agricultural fields and destroy them.
- Taking an initiative, KVIC initiated a pilot project with the Technical assistance of the College of Forestry, Ponnampet, Kodagu District and the results were encouraging.
- Hence, 6 such projects were sanctioned in the most wanted states namely Assam, Maharastra, west Bengal, Orissa, Uttarkhand apart from Karnataka.

### INTER GOVERNMENTAL AGREEMENT TO RE INTRODUCE CHEETAH TO INDIA FROM SOUTH AFRICA



#### Why in news

- Recently, South Africa and India have signed a Memorandum of Understanding on Cooperation in the Re-introduction of Cheetah to the Asian country.

#### Key Highlights

- The Memorandum of Understanding (MoU) on Reintroduction of Cheetah to India facilitates cooperation between the parties to establish a viable and secure cheetah population in India; promotes

conservation and ensures that expertise is shared and exchanged, and capacity built, to promote cheetah conservation.

- This includes human-wildlife conflict resolution, capture and translocation of wildlife and community participation in conservation in the two countries.
- In terms of the MoU, the countries will collaborate and exchange best practices in large carnivore conservation through the transfer of technology, training of professionals in management, policy, and science, and to establish a bilateral custodianship arrangement for cheetah translocated between the two countries.
- The terms of the MoU will be reviewed every five years to ensure it remains relevant.

### Why cheetah to be restored

- Restoring cheetah populations is considered to be a priority for India and will have vital and far-reaching conservation consequences, which would aim to achieve a number of ecological objectives, including re-establishing the function role of cheetah within their historical range in India and improving the enhancing the livelihood options and economies of the local communities.
- Following the import of the 12 cheetah in February, the plan is to translocate a further 12 annually for the next eight to 10 years.
- The initiative to reintroduce cheetah to a former range state following the local extinction of this iconic species due to over hunting and loss of habitat in the last century is being carried out following the request received from the government of the Republic of India.

### Way Forward

- In terms of the agreement, an initial batch of 12 cheetahs are to be flown from South Africa to India during February 2023. The cats will join eight cheetah introduced to India from Namibia during 2022.

### NOBLE'S HELEN: ARUNACHAL PRADESH YIELDS INDIA'S NEWEST BUTTERFLY



### Why in news?

- A swallowtail butterfly disappearing from its

previously known ranges from Myanmar and southern China to Vietnam has been recorded for the first time in India.

- Three butterfly enthusiasts recorded the "extremely rare" Noble's Helen (*Papilio noblei*) from three locations in the Namdapha National Park of Arunachal Pradesh between September 2019 and September 2021.

### Details:

- Butterflies are considered vital indicators representing the state of biodiversity and key ecosystem functions.
- The trio photographed the Noble's Helen live from 19th Mile, Lunkai Nala, and near Deban Camp within the 1,985 sq. km-Namdapha, also India's easternmost tiger reserve.
- The locations are approximately 80 km aerially from Putao of Myanmar's Kachin State, where this species of swallowtail butterfly was last recorded in April 1999.

### Habitat:

- The Noble's Helen, closest to the *Papilio antonio* from the Philippines and characterised by a much large dorsal white spot, was once common in the montane forest at moderate elevations in northern Thailand.
- Apart from Thailand, this species of swallowtail butterfly has been reported from Myanmar, Yunnan and Hubai regions of China, Laos, Cambodia and Vietnam.

### Characteristic feature:

- The Noble's Helen with a wingspan of 100-120 mm was initially thought to be an aberration of the *Papilio helenus* although the former has an extra white spot in the dorsum of the forewing.
- A closer study showed the *Papilio noblei* sports a consistent white spot and has a complete row of red lunules on the underside of the hind wing and discal white areas on the upper side of the hind wing.

### SEA WINDS ERODE SUNDARBANS TEMPLE



### Why in news?

- An ancient terracotta temple in West Bengal's Sundarbans, which has survived the ravages of time for a millennia, is now facing a very modern threat.

- ⇒ The impact of climate change, especially the increase in air salinity, is gradually eroding the outer wall of Jatar Deul, an 11th century Shiva temple, which is located at Raidighi in South 24 Parganas, only a few kilometres from the sea.

#### Visible erosion:

- ⇒ While the temple is 98 feet high, the archaeologist said the erosion is particularly seen in the bricks on the outer wall up to a height of 15 feet.
- ⇒ The temple stands on a vacant site. There are some trees to provide a barrier to coastal winds, particularly on the upper part of the temple, and that can be the reason that erosion is less on the upper side of the temple.
- ⇒ Amphan, the tropical cyclone that ravaged coastal West Bengal, particularly the Sundarbans, in May 2020, had destroyed three trees at Jatar Deul, further exposing the temple to the gusty salt-laden coastal winds.
- ⇒ The archaeologist said that along with the restoration of the structure, the ASI has also planted trees at the site so that they can serve as a barrier to the temple.

#### Historical aspect:

- ⇒ The Jatar Deul is traditionally connected to an inscription, no longer traceable, by one Raja Jayantachandra, purported to have been issued in 975 AD.
- ⇒ The temple is datable to the 10th or 11th century AD on the basis of its architecture.
- ⇒ An expert on West Bengal temples, disagrees with the dating estimate, saying that the temple was more likely to have been built around the beginning of the 13th century based on its architectural features.

#### Architecture:

- ⇒ The stone temples located along the coast such as the famed Konark temple of Odisha are less affected by salinity since the porosity of stone is far less than that of brick.
- ⇒ Jatar Deul is the tallest standing temple in the Sundarbans on the bank of the river Moni.
- ⇒ The temple has a curvilinear tower similar to temple architecture of the Nagara order of Odisha temples.

## SCIENCE & TECH

### MEXICO SEEKS ISRO'S HELP TO BUILD AND LAUNCH SATELLITE

#### Why in news?

- ⇒ The Mexican Space Agency (AEM) has sought the Indian Space Research Organisation's (ISRO) help to build and launch a remote sensing satellite for Mexico.
- ⇒ The request seeking ISRO's support was made at a recent meeting between heads of both agencies.



#### Key Highlights:

- ⇒ In June 2022, ISRO and AEM signed a Scientific Cooperation Agreement on Crop Monitoring and Capacity Building and in 2014 the two space agencies had signed a Memorandum of Understanding for peaceful purposes.
- ⇒ As per the agreement, the two space agencies would explore the development of remote sensing techniques for crop monitoring using Earth Observation data for the United Mexican States and generate user friendly operational tools, techniques, procedures for agricultural drought monitoring over agricultural regions of United Mexican States using open access earth observation data products, drought indices and products at suitable spatial and temporal resolutions for monitoring at aggregate level.

#### Way Forward:

- ⇒ India's interest in expanding space cooperation in the Latin American and Caribbean region through ALCE was also discussed.
- ⇒ ISRO will work on this proposal with the Ministry of External Affairs' (MEA) support.

### MICROSOFT COLLABORATES WITH ISRO TO SUPPORT SPACE-TECH STARTUPS IN INDIA



#### Why in news?

- ⇒ Recently, Microsoft joined hands with the Indian Space Research Organisation (ISRO) to support space-tech startups in the country. A Memorandum of Understanding was signed to empower space tech start-ups across the country.

**Details:**

- Under the new agreement, space tech startups identified by ISRO will be onboarded onto the Microsoft for Startups Founders Hub platform, which supports startups at every stage of their journey from idea to a unicorn.
- The opportunity will provide the startup founders with free access to the tech tools and resources they need to build and run their businesses.

**Key Highlights:**

- The collaboration will provide technical support to build and scale on Azure, best-in-class developer and productivity tools including GitHub Enterprise, Visual Studio Enterprise, and Microsoft 365, and access to smart analytics with Power BI and Dynamics 365.
- As part of the agreement, Microsoft will also provide mentoring support to space tech entrepreneurs in areas ranging from space engineering to cloud technologies, product and design, fundraising, and sales and marketing.
- The startups will also get access to Microsoft Learn for tailored startup-centric training content and programs to help them build connections with the industry and potential customers.
- Meanwhile, leadership sessions will also be organised sessions for startups with space industry experts.

**Way Forward:**

- ISRO's collaboration with Microsoft will greatly benefit space tech startups in their analysis and processing of vast amounts of satellite data for various applications, using cutting-edge methods like AI, Machine Learning, and Deep Learning.
- The Microsoft for Startups Founders Hub is a useful platform for bringing together startups and providers of technology solutions to support the national space technology ecosystem.

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**PERSEVERANCE DROPS 50% BACKUP  
SAMPLES ON MARS FOR FUTURE  
MISSIONS TO BRING HOME**

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**Why in news?**

- The Perseverance rover, which recently completed its one Martian year of operations on the Red Planet, has

successfully dropped five of the 10 sampling tubes with rock cores in them.

- The backup tubes will be picked up by future missions to bring them to Earth in case they are unable to encounter the rover.

**Why rock samples matter?**

- The rock samples are of different natures and the latest one formed from magma, and scientists believe that it was then altered by water several times.
- The rocket could help scientists understand the early history of this area, when life may have been present in the presently barren world.
- Researchers had recently discovered that the bedrock their six-wheeled explorer has been driving on since landing in February likely formed from red-hot magma.
- Even before Perseverance touched down on Mars, the mission's science team had wondered about the origin of the rocks in the area.

**About Perseverance rover:**

- It was launched in 2020 aboard a United Launch Alliance Atlas V.
- It carried a unique instrument, MOXIE or Mars Oxygen ISRU Experiment: which for the first time manufactured molecular oxygen on Mars using carbon dioxide from the carbon-dioxide-rich atmosphere (ISRU means In Situ Resource Utilization: or the use of local resources to meet human needs or requirements of the spacecraft).
- It carried Ingenuity, the first ever helicopter to fly on Mars.
- It is the planned first step to bring back rock samples from Mars for analysis in sophisticated laboratories on Earth: with the goal of looking for biosignatures: or signatures of present or past life.

**What's next?**

- During its one year of Martian operations, the rover has revealed that rocks in the Jazero crater have interacted with water multiple times over the eons and that some contain organic molecules.
- The rover is currently making a sample depot on the surface for future sample return campaign missions to pick and bring to Earth for deeper and better analysis.

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**UNION MINISTER UNVEILED THE THEME  
FOR NATIONAL SCIENCE DAY 2023**

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**Why in news?**

- Recently, the Union Minister of Science & Technology released the theme for the "National Science Day 2023", titled "Global Science for Global Wellbeing".
- As India enters 2023, the theme indicates India's emerging global role and rising visibility in the international arena.



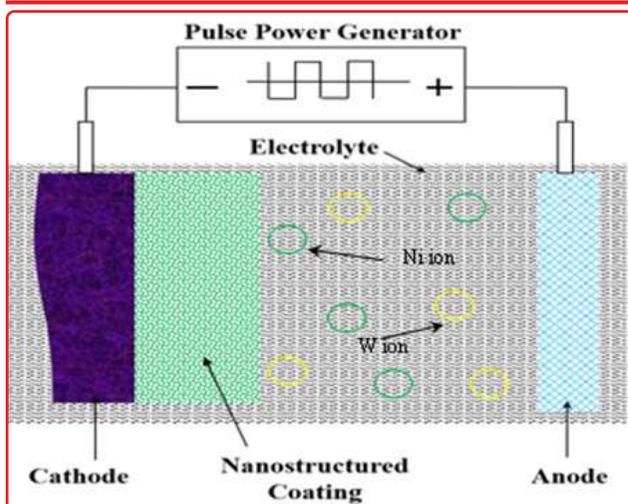
### G20 presidency:

- The theme of "Global Science for Global Wellbeing" is perfectly in sync with India assuming the Presidency of G-20, where she will become the voice of the global south that is the developing countries of Asia, Africa and South America.

### NSD:

- The National Science Day (NSD) is celebrated every year on 28 February to commemorate the discovery of the 'Raman Effect'. Government of India designated 28 February as National Science Day (NSD) in 1986.
- On this day Sir C.V. Raman announced the discovery of the 'Raman Effect' for which he was awarded the Nobel Prize in 1930.
- On this occasion, theme-based science communication activities are carried out all over the country.

## NEW TECHNIQUE OF CORROSION-RESISTANT NICKEL ALLOY COATINGS CAN REPLACE TOXIC CHROME PLATING



### Why in news?

- Scientists at the Centre for Engineered Coatings at International Advanced Research Centre for Powder Metallurgy & New Materials (ARCI), has developed a lab-scale process to deposit novel nanostructured Nickel alloy coatings.

### Background:

- With ever-increasing demand for high-performance materials in engineering applications, nano-crystalline coatings can cater to the need for the replacement of environmental hazardous chrome coatings.
- Chrome coatings have been used in plastic bottling industry to improve the service life of die-casting components.
- However, chrome plating is a toxic process, and the stringent standard permissible exposure limit (PEL) for toxic hexavalent chromium and all its compounds has to be complied in all chrome plating industrial workplaces.
- Finding a procedure for adhering to this limit is a challenge for scientists.

### New research:

- The process uses pulsed current electroplating, which is environmentally benign with high production capacity. In contrast to conventional, direct current used for chrome plating, the research group have used electric current in the form of pulses of duration of a few milliseconds for electroplating purpose.
- The process consists of environment-friendly electrolyte consisting of nickel and tungsten ions that is the source of strengthening elemental tungsten (W) and nickel (Ni).

### Pulsed current effect:

- The pulsed current is applied between the components to be coated, acting as cathode and non-consumable anode.
- The pulsed current effect was used for nano-crystalline coatings wherein high instantaneous current density for very small duration resulted in high rate of nucleation.
- Unlike in conventional direct current plating, the coatings were virtually porosity free, crack free with minimal hydrogen uptake.
- The use of pulsed current resulted in the nano-crystallization of nickel tungsten alloy coatings with high hardness (700-1200 HV) and wear resistance. The coatings were extremely corrosion resistance and could withstand up to 700 hrs of salt spray.

### Outcome:

- The coatings developed at ARCI can withstand temperatures up to 500°C without thermal softening and can improve the life of die components by at least two times than conventional chrome plating.
- They were successfully applied to die-casting components used in plastic bottling industry, wherein the temperatures at the die interface can be over 280°C.

### Way Forward:

- With numerous applications in automotive, defense, and aerospace for these coatings, the process know-

how is ready for transfer as a replacement for conventional chrome plating.

### SCIENTISTS FIND UNDERGROUND AREAS ON MARS THAT COULD BE MORE HABITABLE THAN SURFACE



#### Why in news?

- The Curiosity rover, operating on the surface of the Gale crater on Mars, has made a revealing discovery.

#### Details:

- Scientists have found that the fracture halos under the surface contain water-rich opal, potentially serving as an important resource for human exploration.
- Analysis of data by neutron spectrometer Dynamic Albedo of Neutrons, or DAN revealed that the vast subsurface fracture networks would have provided water-rich and radiation-shielded conditions. These could be potentially more habitable than those on the surface.

#### Fracture halos:

- The fracture halos are light-toned opaline silica features found throughout rocks and are made from the exposed roots of a vast fluid event in recent Martian geologic history.
- Researchers looked at the old images captured by the Curiosity rover and found a huge expanse of fracture halos extending far into the distance.
- They found that these halos not only looked like halos found much later in the mission, in completely different rock units but were similar in their composition: a whole lot of silica and water.

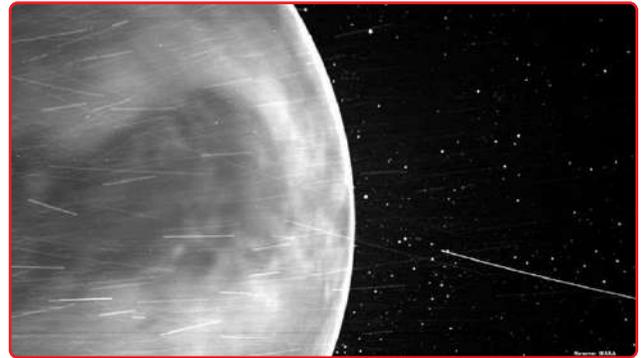
#### Formation:

- The discovery of opal is noteworthy as it can form in scenarios where silica is in solution with water, a similar process to dissolving sugar or salt in water. If there is too much salt, or conditions change, it begins to settle at the bottom.
- Water-rich environments in the subsurface of Mars could have provided a safe haven from the harsh conditions on Mars' surface, which is rather inhospitable compared to Earth.

#### Gale Crater:

- The Gale Crater on Mars is known for cold and harsh temperatures that go down to -70 degrees Celsius.
- Given the widespread fracture networks discovered in Gale Crater, it's reasonable to expect that these potentially habitable subsurface conditions extended to many other regions of Gale Crater as well, and perhaps in other regions of Mars.
- These environments would have formed long after the ancient lakes in Gale Crater dried up.

### ISRO PUSHING VENUS MISSION 'SHUKRAYAAN' TO 2031



#### Why in news?

- The Indian Space Research Organisation (ISRO) is yet to receive approval from the Indian government for the Venus mission and that the mission could as a result be postponed to 2031.

#### Background:

- ISRO's Venus mission, called Shukrayaan I, was expected to be launched in December 2024.
- The idea was born in 2012; five years later, ISRO commenced preliminary studies after the Department of Space received a 23% hike in the 2017-2018 budget.
- The organisation sought payload proposals from research institutes in April 2017.
- Optimal launch windows from Earth to Venus occur once around every 19 months. This is why ISRO has 'backup' launch dates in 2026 and 2028 should it miss the 2024 opportunity.

#### Other missions to Venus:

- But even more optimal windows, which further reduce the amount of fuel required at liftoff, come around every eight years.
- Both the U.S. and the European space agencies have Venus missions planned for 2031 referring to VERITAS and EnVision, respectively while China might go anytime: 2026, 2027, whenever they want to go.

#### Shukrayaan I:

- ISRO had originally hoped to launch Shukrayaan I in mid-2023 but cited the pandemic when it pushed the date to December 2024. Other ISRO missions,

including Aditya L1 and Chandrayaan III, have also been affected by manufacturing delays and commercial launch commitments.

- Shukrayaan I will be an orbiter mission. Its scientific payloads currently include a high-resolution synthetic aperture radar and a ground-penetrating radar.
- The mission is expected to study Venus's geological and volcanic activity, emissions on the ground, wind speed, cloud cover, and other planetary characteristics from an elliptical orbit.

#### Budget:

- ISRO received an allocation of ₹13,700 crore in the 2022-2023 budget, marginally higher than the year before. The bulk was diverted to the human spaceflight mission, Gaganyaan.
- Ahead of the forthcoming budget announcement, and following recent reforms in the private spaceflight sector, various industry groups have drafted a wishlist, including boosts to local manufacturing and procurement.

### MUSK'S SPACEX LAUNCHES SECRET SATELLITE FOR US SPACE FORCE, LAND TWIN ROCKETS



#### Why in news?

- In what was the first Falcon-Heavy launch of the year, Elon Musk's SpaceX launched a classified mission for the United States Space Force (USSF) from the Kennedy Space Center (KSC) in Florida.
- The mission also carried the Long Duration Propulsive ESPA (LDPE)-3A payload adapter that can hold up to six small satellites and five of those slots were filled on the mission.

#### CBAS-2:

- The primary satellite for the mission was Continuous Broadcast Augmenting SATCOM 2 (CBAS-2) which was sent into geostationary orbit over 35,000 kilometers above Earth.
- The satellite provides communications relay capabilities in support of our senior leaders and combatant commanders.
- The mission of CBAS-2 is to augment existing military satellite communication capabilities and

continuously broadcast military data through space-based satellite relay links.

#### Falcon-Heavy:

- The Falcon-Heavy is the most powerful rocket built by the company that is propelled by three modified first stages of the Falcon-9 rocket. The three boosters are strapped together with the central booster pushing the payload into the designated orbit around the planet.
- So far, the Falcon-Heavy has conducted five launches and a total of 11 landings.
- As one of the world's most powerful operational rockets, Falcon Heavy can lift nearly 64 metric tons to orbit.
- The rocket is powered by 27 Merlin engines that together generate more than 5 million pounds of thrust at liftoff, equal to approximately eighteen 747 aircraft.

### FIRST EVIDENCE OF SOLITARY WAVES NEAR MARS MAY DECODE THE MYSTERY BEHIND ION LOSS IN THE PLANET



#### Why in news?

- Scientists have reported the first evidence of the presence of solitary waves or distinct electric field fluctuations in the Martian magnetosphere.
- The study of these waves is crucial as they directly control particle energization, plasma loss, transport, etc., through wave-particle interactions.

#### Background:

- The Earth is a giant magnet, and its magnetic field protects us from high-speed charged particles that are continuously emitted from the Sun in the form of solar wind. Unlike Earth, the planet Mars do not have any intrinsic magnetic field. This allows the high-speed solar wind to interact directly with the Mars atmosphere, like an obstacle in flow.
- It has been suggested that even in a weak and thin magnetosphere as that of the Mars, one can observe frequent occurrences of solitary waves. However, despite several missions to Mars, the presence of solitary waves in the Martian magnetosphere has never been reported earlier.

**Recent research:**

- For the first time, a research team from the Indian Institute of Geomagnetism (IIG) has identified and reported the solitary waves in the Martian magnetosphere with the help of high-resolution electric field data recorded by Langmuir Probe and Waves instrument on the Mars Atmosphere and Volatile Evolution (MAVEN) spacecraft of NASA.
- The magnetosphere is weak but highly dynamic and formed due to the direct interaction of solar winds with the Martian atmosphere.

**Solitary waves:**

- Solitary waves are the distinct electric field fluctuations (bipolar or monopolar) that follow constant amplitude-phase relations. Their shape and size are less affected during their propagation.
- The magnitude and duration of these pulses are found to be 1-25 millivolt/meter and 0.2-1.7 milliseconds, respectively. These pulses are dominantly seen in the dawn and afternoon-dusk sectors at an altitude of 1000-3500 km around the Mars.
- The dominant occurrence of solitary waves in the dawn and dusk sector is still a mystery and needs further investigation. Through simulations, it is found that the spatial extent of these structures is very small (30-330 meters).

**Way Forward:**

- As these waves are known to be responsible for the plasma energization and its transport in Earth's magnetosphere, the team is further exploring their role in the particle dynamics in the Martian magnetosphere and whether such waves play any role in the loss of atmospheric ions on the Mars.

**SII'S COVID VACCINE COVOVAX GETS HETEROLOGOUS BOOSTER DOSE APPROVAL**



**Why in news?**

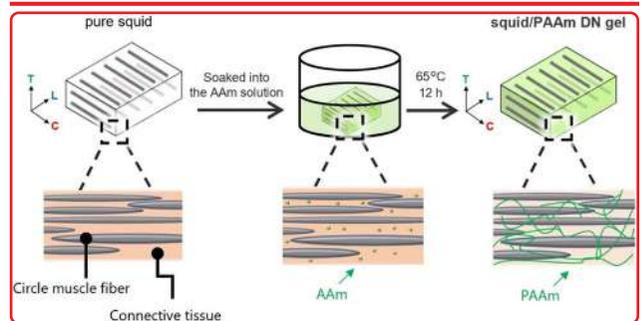
- Recently, the Drug Controller General of India (DCGI) has approved market authorisation to COVID-19 vaccine Covovax as a heterologous booster dose for adults who have been administered two doses of Covishield or Covaxin.

- The DCGI's approval came following recommendation by the Subject Expert Committee of the Central Drugs Standard Control Organisation (CDSCO).

**Covovax:**

- Covovax is manufactured through technology transfer from Novavax.
- It has been approved by the European Medicines Agency for conditional marketing authorisation. It was granted emergency-use listing by the World Health Organization (WHO) on December 17, 2021.
- In August 2020, US-based vaccine maker Novavax Inc. had announced a licence agreement with the SII for the development and commercialisation of NVX-CoV2373, its COVID-19 vaccine candidate in India and low-and-middle-income countries.

**RESEARCHERS COMBINE NATURAL SQUID TISSUES WITH SYNTHETIC POLYMERS TO DEVELOP HYDROGEL**



**Why in news?**

- Natural squid tissues and synthetic polymers were blended by scientists at Hokkaido University in Japan to create a robust hydrogel that closely resembles the special characteristics of biological tissues.
- There are numerous applications for hydrogels, which are polymer networks that contain a lot of water, including soft robotic parts, new sensing systems, and medical prosthetics.

**Why it matters?**

- Natural biological tissues exhibit unique properties essential for their functions, which researchers are seeking to replicate in hydrogels.
- Muscles, for example, in addition to strength and flexibility, have physical properties that vary in different directions and are built from a hierarchy of structures working together. Bones and blood vessels also display these features, known as hierarchical anisotropy.
- Unlike the natural tissues that researchers wish to mimic, most synthetic hydrogels have uniform properties in all directions and are structurally weak.

**How gel was prepared?**

- The manufacturing process begins with commercially available frozen squid mantle, the main outer part of a

squid. In live squid, the mantle expands to take water into the body, and then strongly contracts to shoot water outwards as a jet.

- This ability depends on the anisotropic muscles within squid connective tissue. The researchers took advantage of the molecular arrangements within this natural system to build their bio-mimicking gel.
- Chemical and heat treatment of thin slices of the defrosted squid tissue mixed with polyacrylamide polymer molecules initiated formation of the cross-linked hybrid hydrogel.
- It has what is known as a double-network structure, with the synthetic polymer network embedded and linked within the more natural muscle fiber network derived from squid mantle.

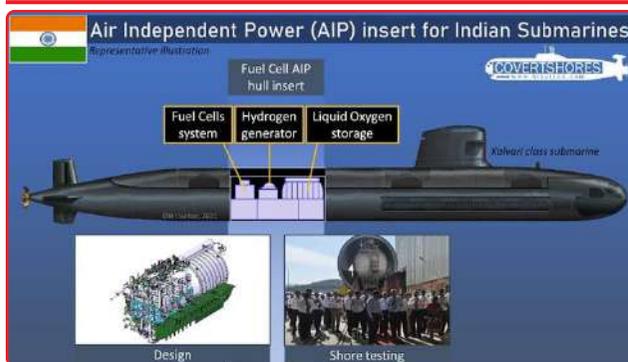
#### Potential:

- The current proof-of-concept work should be just the start for exploring many other hybrid hydrogels that could exploit the unique properties of other natural systems.
- Jellyfish have already been used as a source of material for simpler single-network hydrogels, so are an obvious next choice for exploring hybrid double-network options.
- Possible applications include load-bearing artificial fibrous tissues, such as artificial ligaments and tendons, for medical use.

#### Way Forward:

- Further work by the team will explore the biocompatibility of the gels and investigate options for making a range of gels suitable for different uses.

### DRDO'S FUEL CELL-BASED AIR INDEPENDENT PROPULSION SYSTEM TO SOON BE FITTED ONBOARD INS KALVARI



#### Why in news?

- In a major boost to 'Aatmanirbhar Bharat', Fuel Cell-based Air Independent Propulsion (AIP) system of DRDO's Naval Materials Research Laboratory (NMRL) will soon be fitted onboard INS Kalvari.

#### Details:

- An agreement was signed between NMRL and Naval Group France in Mumbai to extend cooperation to

enter into the detailed design phase for integration of indigenous AIP in the Kalvari class submarines.

- As part of the agreement, Naval Group France will certify the AIP design for integration in the submarines.

#### Air Independent Propulsion (AIP):

- The AIP has a force multiplier effect on lethality of a diesel electric submarine as it enhances the submerged endurance by several folds.
- It has merits in performance compared to other technologies and is unique as the hydrogen is generated onboard.
- This technology has been successfully developed by NMRL with the support of Indian industry partners. The technology has now reached the stage of maturity for industrialisation.

#### Next step:

- The land-based prototype of the NMRL's AIP has been tested successfully.
- This new endeavour will be a significant step towards the detailed design certification of the energy module, which will be performed by NMRL along with Indian industry and design of the platforms impacted by the integration of the indigenous AIP inside the Indian submarine by Naval Group.
- These actions will seamlessly lead the way to start of localisation and industrialization of AIP including the hull fabrication by the Indian industry for future fitment on-board the submarines.

### THE SCIENCE OF PEE-BACK PAINT: IT IS INSPIRED FROM NATURE

#### Why in news?

- Badly hit by the menace of public urination, London has a plan to deter people who are 'stenching' the city's reputation.
- Officials in Soho, a London area famous for bars, restaurants, theatres, and other entertainment venues are coating walls with unique paint.

#### Why unique?

- It splashes back the liquid thrown on it. The anti-pee paint creates a transparent water-repellent layer that splashes back urine when the layer comes in contact with the pee.

#### What is Anti-Pee Paint?

- The paint is mostly made up of acetone and silica with the major constituent being sand.
- The superhydrophobic coating keeps objects dry and is capable of repelling almost every liquid that is thrown on it.
- The paint uses an omniphobic technology to coat an object and create surface chemistry and texture with patterns of geometric shapes that have peaks or high points. These high points repel water, some oils, wet concrete, and other liquids.

**Lotus effect:**

- A 2015 study revealed that the lotus effect is attributed to a surface structure that is covered with needle-shaped wax tubes, and the remaining surface allows invasion of the water droplet and enlarges the interaction with water. The paint creates those high points.
- The coating is to be applied in two stages, with the first stage acting as a base primer. This primer smoothens the surface, making it hydrophobic after which the topcoat is applied.
- A hydrophobic surface does not allow liquid to stick to it, unlike a hydrophilic surface where water sticks.
- The paint repels dirty water and some oils, and remains clean and virtually bacteria-free.

**Background:**

- London is, however, not the first city to use this unique recipe of chemicals to deter public urinators.
- Cologne in Germany was the first to use this paint about seven years ago in 2015.

**HEALTH****'SMART' PROGRAM FOR AYURVEDA PROFESSIONALS TO BOOST R&D IN AYURVEDA****Why in news?**

- Recently, 'SMART' (Scope for Mainstreaming Ayurveda Research in Teaching Professionals) program aimed to boost scientific research in priority healthcare research areas through Ayurveda colleges and hospitals was launched.
- It was launched by the National Commission for Indian System of Medicine (NCISM) and the Central Council for Research in Ayurvedic Sciences (CCRAS), the two prominent institutions under the Ministry of Ayush.

**Objective:**

- The proposed initiative is conceptualised with an objective to identify, support and promote innovative research ideas in healthcare research areas including Osteoarthritis, Iron Deficiency Anaemia, Chronic Bronchitis, Dyslipidemia, Rheumatoid Arthritis, Obesity, Diabetes Mellitus, Psoriasis, Generalised

Anxiety Disorder, Non-alcoholic fatty liver disease (NAFLD).

**Way Forward:**

- The large network of Ayurveda colleges and hospitals across the country is an asset for the country in terms of its healthcare needs.
- The 'SMART' program will certainly motivate teachers for taking up projects in designated areas of healthcare research and create a large database.

**INDIA'S KALA-AZAR CASES DECLINED 98.7% SINCE 2007: HEALTH MINISTRY****Why in news?**

- According to Union Health Minister, Kala-azar cases in India fell to 834 in 2022 from 44,533 in 2007, a 98.7 per cent decline.

**Details:**

- As many as 632 endemic blocks (99.8 per cent) spread across Bihar, Uttar Pradesh, Jharkhand and West Bengal have received elimination status (less than one case per 10,000). He was chairing a high-level review meeting on the status of the disease in these four endemic states.
- Only one block (Littipara) of Pakur district, Jharkhand is in the endemic category (1.23 cases / 10,000 population).

**Kala-azar:**

- After malaria, kala-azar is the deadliest parasitic disease in the world. It is one of the three conditions in the disease group called leishmaniasis caused by the protozoa parasite Leishmania.
- The parasite is transmitted to humans by the bite of an infected female phlebotomine sandfly, a tiny 2-3 mm long insect vector, according to the World Health Organization (WHO).

**Global burden:**

- Visceral leishmaniasis or kala-azar is the most serious form of the disease and as of November 2022, about 89 per cent of the global cases were reported from eight countries: Brazil, Eritrea, Ethiopia, India, Kenya, Somalia, South Sudan and Sudan, WHO noted. India contributes 11.5 per cent of total cases reported globally.

- The disease mainly affects poor people in Africa, Asia and Latin America, and is associated with malnutrition and poor housing, population displacement, weak immune system and lack of resources.

#### India's status:

- India is committed to eliminating Kala-azar or Black Fever from the country by 2023.
- To this goal, the central government has taken steps such as building of pucca houses through PM-AWAS yojana, rural electrification, testing, treatment and periodic high-level review, incentivising through award distribution, among others.
- The Centre is supporting the states in active case detection, surveillance, treatment as well as supply of diagnostic kits, medicines, sprays.
- Currently, more than 90 per cent of the Kala-azar cases are contributed by Bihar and Jharkhand, according to PTI. Uttar Pradesh (2019) and West Bengal (2017) states have achieved their elimination targets at the block level.

### NEW SYSTEM TO MEASURE AND GRADE PERFORMANCE OF HOSPITALS EMPANELED UNDER AYUSHMAN BHARAT PM-JAY SCHEME.

#### Why in news?

- With an objective to shift the focus of measuring performance of hospitals from volume of services provided to the value of healthcare services, National Health Authority (NHA) is introducing a new system to measure and grade hospital performance under the flagship scheme Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB PM-JAY).

#### Value-based care:

- Traditionally, from the payer's perspective, the healthcare model has been focussed on the quantity of services delivered, where case-based bundled payment is made on the basis of the number of services provided.
- The new initiative will introduce the concept of 'value- based care', where payment will be outcome based and providers will be rewarded according to the quality of the treatment delivered. Under the new model, the providers will be rewarded for helping the patients improve their health, which consequently will reduce the effects of disease in the population in the long term.
- The step promises significant increase in the overall health gains and is expected to be a win-win for all concerned stakeholders from patients to healthcare providers, payers and suppliers.
- While the patients will get better health outcomes and higher satisfaction out of the services they receive, providers stand to get better care efficiencies. Similarly, payers will be able to maximize the health

benefits generated out of the spending incurred.

- In a value-based healthcare system, the payers can also exercise strong cost controls. A healthier population with fewer claims translates into less drain on payers' premium pools and investments. Suppliers would benefit from being able to align their products and services with positive patient outcomes and reduced cost.
- Altogether, value-based care promises to significantly improve healthcare landscape in India by incentivizing and encouraging healthcare providers to focus more on delivering patient centric services.

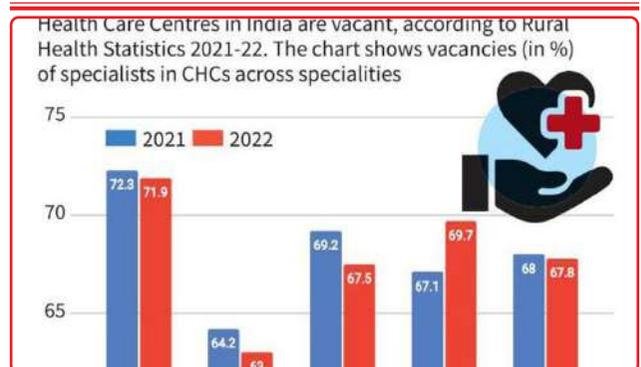
#### Indicators:

- Under value-based care, the performance of AB PM-JAY empanelled hospitals will be measured based on five performance indicators such as:
  - a) Beneficiary Satisfaction;
  - b) Hospital Readmission Rate;
  - c) The extent of Out-of-Pocket Expenditure;
  - d) Confirmed Grievances and
  - e) Improvement in-patient's Health-Related Quality of Life.
- The performance of the hospitals based on the above indicators shall also be made available on a public dashboard that will help the beneficiaries to make an informed decision.
- In this way, the hospital performance shall not only determine the financial incentive of the hospital but also create a demand for quality treatment of beneficiaries under PMJAY.

#### Way Forward:

- Collectively these interventions of performance assessment and value-based incentives, use of health technology assessment, and use of digital tools to monitor the quality of care will transform AB PM-JAY and the Indian health system from a volume-based to a value-based health care delivery system.

### 80% SHORTFALL OF SPECIALIST DOCTORS IN CHCS: HEALTH MINISTRY REPORT



#### Why in news?

- Recently, the Rural Health Statistics report was published by Ministry of Health and Family Welfare.

**Vacancy in CHCs:**

- India is reeling under an acute shortage of specialist doctors, with a shortfall of nearly 80% of the required specialists at Community Health Centres (CHCs).
- CHCs are 30-bed block-level health facilities which are ideally supposed to provide basic care related to surgery, gynaecology, paediatrics and general medicine.

**Key Highlights:**

- There is a shortfall of specialist doctors, including surgeons (83.2%), obstetricians and gynaecologists (74.2%), physicians (79.1%) and paediatricians (81.6%).
- There are 6,064 CHCs across India and the Health Ministry has been unsuccessful in meeting the requirement for specialist doctors in most of these centres.
- This is despite the fact that, in 2005, the number of specialist doctors in CHCs was 3,550, which has seen a 25% increase to 4,485 in 2022. However, with the number of CHCs growing, the requirement for specialist doctors required to make the centres functional has also increased.
- Requirements of specialist doctors in CHCs has increased by 63.8%, whereas there is only an increase of 26.3% in the actual number of in-position specialists.
- Apart from specialist doctors, there is also a shortage of female health workers and auxiliary nursing midwives, with upto 14.4% of these posts lying vacant in primary health centres and sub-centres.

**Recommendations:**

- The funds should be provided for outsourcing and providing support services according to the need of each centre.
- It recommends that nursing orderlies be trained in the assistive procedures required for surgery.

**UNION HEALTH MINISTER DR. MANSUKH MANDAVIYA UNVEILS WORLD'S FIRST INTRANASAL COVID19 VACCINE, INNCOVACC**



**Why in news?**

- Recently, Dr. Mansukh Mandaviya, Union Minister of Health & Family Welfare unveiled the iNNCOVACC COVID19 vaccine.

**About iNNCOVACC:**

- iNNCOVACC is the world's first intranasal COVID19 vaccine to receive approval for the primary 2-dose schedule, and as a heterologous booster dose.
- It is developed by Bharat Biotech International Limited (BBIL) in collaboration with Biotechnology Industry Research Assistance (BIRAC), a PSU under the Dept of Biotechnology, Ministry of Science and Technology.

**Features:**

- iNCOVACC is a cost effective covid vaccine which does not require syringes, needles, alcohol wipes, bandage, etc, saving costs related to procurement, distribution, storage, and biomedical waste disposal, that is routinely required for injectable vaccines.
- It utilizes a vector-based platform, which can be easily updated with emerging variants leading to large scale production, within a few months.
- These rapid response timelines combined with the ability of cost effective and easy intranasal delivery, makes it an ideal vaccine to address future infectious diseases.

**ZyCoV-D:**

- ZyCoV-D, the world's first and India's indigenously developed DNA based vaccine for Covid-19 to be administered in humans including children and adults 12 years and above, was also developed in partnership with the Department of Biotechnology in the Ministry of Science & Technology under 'Mission Covid Suraksha' through BIRAC.

**CULTURE**

**WHY IS THE JAIN COMMUNITY PROTESTING ACROSS THE COUNTRY?**



**Why in news?**

- India crawled its way into 2023 with widespread protests taking place across the nation. Cities including Delhi, Mumbai, and Ahmedabad saw people from the Jain community pour into the streets against the Jharkhand government's latest decision to declare the holy Shri Sammed Shikharji in Giridih district as an eco-tourist place.

➤ Hundreds of members of the Jain community also carried out parallel rallies in Ahmedabad and Mumbai, demanding action against anti-social elements allegedly desecrating the sacred Shetrunjaya Hills in Gujarat's Bhavnagar district.

### Sammed Shikharji:

- Located on Parasnath Hills in Jharkhand's Giridih district, Shri Sammed Shikharji is considered one of the most sacred shrines of Jains.
- The state government's decision to use it to boost religious tourism has not gone down well with the community, which believes it will impact the sanctity of the site.
- The pilgrimage site is important for both the Digambara and Svetambara sects as 20 out of 24 Jain Tirthankaras along with monks attained moksha in the place.

### Background:

- The Jharkhand government announced the decision to convert the site into a tourist spot as part of its Tourism Policy launched in July 2022.
- In November, the community had written to the chief secretary of the Government of Jharkhand, urging the administration to declare the Shri Sammed Shikharji temple a holy place only as it is considered the highest place of pilgrimage of the Jain religion. However, no action has been taken so far.

### Demand of the NCM:

- The National Commission for Minorities (NCM) has written to the chief secretary of the Jharkhand administration about denotifying Parasnath Parvatraj Giridih (Jharkhand) as an eco-tourism centre and declaring the same as a holy place.

### About NCM:

- National Commission for Minorities (NCM) was set up under the National Commission for Minorities Act, 1992.
- It monitors the working of the safeguards for minorities provided in the Constitution and in laws enacted by Parliament and the state legislatures.
- Six religious communities, viz; Muslims, Christians, Sikhs, Buddhists, Zoroastrians (Parsis) and Jains have been notified in Gazette of India as minority communities by the Union Government all over India.

## 'VIGYANIKA – SCIENCE LITERATURE FESTIVAL' EVENT IN IISF, BHOPAL

### Why in news?

- Vigyanika, a Science Literature Festival is going to be organised during 22 & 23 January, 2023 in the Indian International Science Festival (IISF), MANIT, Bhopal.
- "Science Literature Festival" is being organised as part of the 8th India International Science Festival (IISF).



### IISF:

- The annual India International Science Festival, which is in its 8th edition this time, showcases and celebrates the fruits of science and technology.
- IISF aims to engage the public with science and demonstrate how science, technology, engineering and mathematics (STEM) provide solutions to improve our lives.
- In 2023, IISF is being coordinated and organised by the Ministry of Earth Sciences, Ministry of Science & Technology and Vijnana Bharati.
- Since the launch of IISF in 2015, the "Science Literature Festival" has emerged as one of the well-attended events.

### Vigyanika:

- Aligned to the larger objective of IISF, the Vigyanika will showcase India's rich legacy of promoting science & inculcating scientific temper among the public through multilingual scientific literature, science poetry, science drama and folk art.
- Vigyanika seeks to promote discussions and deliberations on challenges and future roadmap for effective communication of scientific knowledge.
- As India is celebrating Azadi ka Amrit Mahotsav to mark 75 years of Indian independence, Vigyanika will also commemorate the Amrit Kaal aligned with science and technology in India through discussions.

### S20:

- India is also going through the Presidency phase of the G20 and Indian Institute of Science is the Secretariat for Science 20 (S20).
- S20 will address the scientific aspects such as climate change, food security and health.
- Vigyanika will have six sessions, including keynote lectures, panel discussions, and interactions with authors, depiction of scientific ideas through drama & folk dance, and Vigyan Kavi Sammelan.

## PYRAMID-LIKE AHOM BURIAL MOUNDS IN ASSAM TO VIE FOR UNESCO WORLD HERITAGE SITE TAG

### Why in news?

- The Centre has decided to nominate Assam's Charaideo Maidams, the Ahom equivalent of the

ancient Egyptian pyramids, for the UNESCO World Heritage Centre in 2023.



### Ahom Dynasty:

- Prime Minister chose the maidams, representing the late medieval (13th-19th century CE) mound burial tradition of the Tai Ahom community in Assam, from among 52 sites across the country seeking the World Heritage Site tag.
- The Ahom rule lasted for about 600 years until the British annexed Assam in 1826.
- Charaideo, more than 400 km east of Guwahati, was the first capital of the Ahom dynasty founded by Chao Lung Siu-Ka-Pha in 1253.

### What are Charaideo Maidams?

- Out of 386 Maidams or Moidams explored so far, 90 royal burials at Charaideo are the best preserved, representative of and the most complete examples of mound burial tradition of the Ahoms.
- The Charaideo Maidams enshrine the mortal remains of the members of the Ahom royalty, who used to be buried with their paraphernalia.
- After the 18th century, the Ahom rulers adopted the Hindu method of cremation and began entombing the cremated bones and ashes in a Maidam at Charaideo.

### Lachit Barphukan:

- The nomination of the Charaideo Maidams has attained significance at a time when the country is celebrating the 400th birth anniversary of Lachit Barphukan.
- Lachit Barphukan is a legendary Ahom general whose battle against the Mughals in 1671 made him a BJP icon.

## MISCELLANEOUS

### MUGHAL GARDENS IS NOW AMRIT UDYAN



### Why in news?

- The Rashtrapati Bhavan gardens, popularly known as the Mughal Gardens, was renamed Amrit Udyan.
- The garden is thrown open to the public for a limited period during spring each year.

### About Amrit Udyan:

- Designed by Edwin Lutyens, the iconic garden is spread across 15 acres and it incorporates both Mughal and English landscaping styles.
- The main garden has two channels intersecting at right angles dividing the garden into grid of squares, a Charbagh (a four-cornered garden), a typical characteristic of the Mughal landscaping.
- There are six lotus-shaped fountains at the crossings of these channels rising to a height of 12 feet. The garden houses nearly 2,500 varieties of dahlias and 120 varieties of roses.

### New additions:

- During the term of former Presidents Dr. APJ Abdul Kalam and Ram Nath Kovind more gardens were developed including- two herbal gardens, a tactile garden and a Bonsai Garden.
- President Kalam had also constructed a Manipuri style thinking hut at the gardens, where he claimed he wrote two of his books.
- In 2010, an expert restoration committee- demolished the hut since the committee felt that it interfered with the original design.
- One of the modern-day musical fountains that President Kalam had installed was also removed since the committee felt that it defiled the heritage character of the gardens.



## PRACTICE QUESTION FOR UPSC PRELIMS EXAM

1. Consider the following statement:
  1. Larsen & Toubro (L&T) are building K9-Vajra in India.
  2. Larsen & Toubro is building using technology transfer from South Korean defence major Hanwha Defense Co. Ltd.
  3. The K9-Vajra was mainly bought for use in High altitude of Ladakh.
 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 Sustainable Aquaculture In Mangrove Ecosystem (SAIME):
  1. Under this initiative, farmers have taken up cultivation of Mangroves.
  2. Contribution of mangrove leaf litter in the nutritional dynamics in SAIME ponds has been initiated.
  3. The initiative started in 2019 has established a collaborative ecosystem.
 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:
  1. Shrimp cultivation is a unique ecosystem in India.
  2. Black tiger shrimp and giant freshwater prawn (*M. rosenbergii*) are important variety of shrimp.
 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 Lumpi-ProVacind:
  1. It is used in animals.
  2. It induces LSDV-specific antibody-and cell-mediated immune response.
  3. Lumpi-ProVacind is used for the prophylactic immunization of animals against Lumpy Skin Disease.
 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 Lumpy Disease:
  1. The disease has been controlled and contained with Goatpox vaccine in the country.
  2. The first case of this disease was reported from the state of Uttar Pradesh.
 Choose the correct option from the codes given below:
 

a) 1 Only	b) 2 Only
c) 1 and 2	d) None of the above
  
6. Consider the following statement:
  1. UN General Assembly had accepted India's proposal for International Year of Millets (IYM) 2023.
  2. 'Millets' were among the first crops to be domesticated in India.
  3. Millets are primarily a rabi crop.
 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 photorespiration:
  1. It is a process in which it gives out carbon and energy after the food is prepared.
  2. It incorporates carbon into other molecules or metabolites.
 Choose the correct option from the codes given below:
 

a) 1 Only	b) 2 Only
c) 1 and 2	d) None of the above
  
8. Consider the following statement regarding Coral Preservation:
  1. It is a technique that involves preserving coral tissue or gametes.
  2. It aims is to maintain the genetic diversity of coral species.
 Choose the correct option from the codes given below:
 

a) 1 Only	b) 2 Only
c) 1 and 2	d) None of the above
  
9. Consider the following:
 

1. Coastal protection	2. Carbon sequestration
3. Medicine	

 Which among the following is the significance of coral-reef?



20. Consider the following:
1. Part IV
  2. Part IV A
  3. Part III
- Which among the following Part of the Indian Constitution are conferred on animals?
- a) 1 and 2
  - b) 2 and 3
  - c) 1 and 3
  - d) 1, 2 and 3
21. Consider the following statement:
1. Argentina has the third-largest reserve of the mineral in the world.
  2. Lithium is used in manufacturing batteries.
  3. Argentina is the largest producer of lithium in the world.
- 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
22. Consider the following statement regarding Broadcasting Infrastructure and Network Development (BIND) Scheme:
1. It is a scheme to provide financial support private broadcasting companies.
  2. It aims to development high-quality content for both domestic and international audiences.
- Choose the correct option from the codes given below:
- a) 1 Only
  - b) 2 Only
  - c) 1 and 2
  - d) None of the above
23. Recently, the Union Cabinet has approved National Green Hydrogen Mission. Consider the following:
1. Cumulative reduction in fossil fuel imports.
  2. Creation of jobs.
- Which among the following is the outcome of this mission by 2030?
- a) 1 Only
  - b) 2 Only
  - c) 1 and 2
  - d) None of the above
24. Consider the following:
1. Ocean circulation
  2. Large Mountain range
  3. Climate change
- Which among the following are the major cause for which southern hemisphere is hit by storm?
- a) 1 and 2
  - b) 2 and 3
  - c) 1 and 3
  - d) 1, 2 and 3
25. Consider the following statement regarding the sixth schedule:
1. Under article 244, Constitution protects the autonomy of tribal populations.
  2. Ten autonomous councils exist in Assam, Meghalaya, Tripura and Mizoram.
  3. As per the 2011 Census, out of the total population of Ladakh, and nearly 20% of them are tribals.
- 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
26. Consider the following statement regarding "Bomb Cyclone"
1. It is a large, intense midlatitude storm.
  2. Storms form when a mass of low-pressure air meets a high-pressure mass.
  3. It does not cause precipitation.
- 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
27. Consider the following statement regarding Phytotrid technology:
1. The technology is developed by Israel.
  2. It is used to treat waste water under sedimentation process to eliminate solid matter.
  3. Through this process organic matter gets eliminated.
- 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
28. Consider the following statement regarding Jal Shakti Abhiyan:
1. It brought various organisation like NGOs and Panchayats together.
  2. This has led to a reduction in the over exploited, critical and semi critical number of blocks.
- Choose the correct option from the codes given below:
- a) 1 Only
  - b) 2 Only
  - c) 1 and 2
  - d) None of the above
29. Consider the following statement:
1. Hydrogen is a key industrial fuel.
  2. Grey hydrogen is produced from natural gas.
  3. 'Blue' hydrogen is produced from fossil fuel.
- 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
30. Consider the following statement regarding "Atmospheric River":
1. It transports water vapor outside of the tropics.
  2. It carries water at the mouth of the Mississippi River.
  3. This water is then deposited on the surface but fails to bring rain.
- 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
31. Consider the following statement regarding HMS Tamar:
1. It is deployed to replace existing river class vessels.
  2. It has been named after the Tamar River in France.























## PRACTICE QUESTION FOR UPSC MAINS EXAM

1. Give a brief note on remote electronic voting machines (RVMS) newly devised by the Election Commission of India (ECI). How significant is the migrant vote? What are the challenges to remote voting?
2. What are the ways in which AI-manipulated digital media can impact the lives of individuals as well as influence the public discourse? How is it employed by various groups and how can society overcome the 'infodemic'?
3. 'Every saint has a past, and every sinner has a future.' In the light of above statement discuss how the judiciary, executive, and legislature must work together to help to decarcerate and stop building more prisons in India?
4. 'Legislating to prevent animal cruelty is no longer an option; it transforms into a binding duty cast on the state'. Elaborate
5. December 2022, marks the 30th anniversary of the 73rd and 74th constitutional amendments. Discuss why debates on federalism should include larger discussions on how power should be divided and shared between governments at the Union, State, and local level?
6. What are the objectives of the National Green Hydrogen Mission? What are the two umbrella sub-programmes under the Mission? Why does the country want to be a leading exporter of green hydrogen?
7. 'With no global consensus or frameworks in place, cryptocurrency regulation is one area where India can lead the way by leveraging the G20 presidency'. Comment.
8. What has the Australian Strategic Policy Institute found about the clash between Indian and Chinese troops in the Yangtse area of the Tawang region in Arunachal Pradesh? Give a suitable way out to avoid skirmish in future.
9. Discuss why India cannot afford to further delay its Census? What are the implications of Census delay?
10. 'The recent Joshimath episode is a warning that the Himalayan environment is at a tipping point and it may not be able to withstand another push generated by intrusive anthropogenic activities. Comment.
11. 'The Kashi-Tamil Sangamam upholds the spirit of 'Ek Bharat Sreshtha Bharat'. It has ignited a new cultural zeal in India and whetted the country's appetite for more.' Elaborate.
12. The rates and number of both preterm births and stillbirths are unacceptably high and drive the neonatal, infant and child mortalities upwards in India. Discuss how a majority of them can be prevented by scaling up known and proven interventions and improving the quality of health services.
13. Discuss BRICS's future as a forum of constructive dialogue and as a promoter for a multipolar shift in world politics, giving more visibility to Global South's perspective, in current scenario.
14. Give a brief on constitutional provisions related special address at the first session of Parliament as well as State Legislative Assembly and to both Houses wherever the State also has a Legislative Council. What is the purpose of this convention being followed in India?
15. What is land subsidence and why does it happen? What are the reasons for recent Joshimath crisis and how it is linked with ongoing infrastructure and development project?
16. 'For India, there are clear economic and strategic payoffs to investing in critical emerging technologies (CETs) development, and without the right enabling measures, both sustained economic growth and national security would be under a cloud'. Discuss.
17. 'Election Commission's initiative to enfranchise migrant voters is a step in the right direction but the consensus approach is imperative not only to keep intact the democratic heritage of the Commission but to help further entrench its popular trust and institutional integrity'. Elaborate.
18. Why is there opposition against the new Remote Electronic Voting Machine (RVM)? What will be the administrative and logistical challenges? Are there doubts regarding the existing EVMs? What are VVPATs and why were they introduced inside the voting units?
19. What mandate does the Forest Rights Act give gram sabhas? What is the difference between reserve forests, protected areas, community forest resource and ecologically sensitive zones? What were the problems with the implementation of ESZs? Why were there protests in Kerala against ESZs?
20. Ten years have passed since the Protection of Children from Sexual Offences (POCSO) Act, 2012, came into effect. A decade is a reasonable time period to analyse how this legislation has been functioning and how far it has achieved its stated objectives. Discuss need to take a review of the way the Act has been implemented, as there are still imperfections despite its impact.
21. 'The powers of local elected officials remain curtailed by State governments and local bureaucrats in multiple ways, thereby diluting the spirit of the constitutional amendments aimed at local empowerment. Sarpanchs need to have administrative or financial autonomy for meaningful decentralization'. Comment.

22. To what extent is the 'one-child policy' responsible for China's shrinking population? Why has the country now announced a 'three-child policy' including financial inducements? Will this help stop the slide?
23. 'A recent report by the World Bank on financing India's urban infrastructure needs, focuses on private investments ameliorating urban problems. It is another reminder of the tragedy which Indian urbanisation is witnessing policy paralysis from the top'. Comment.
24. What is the Ken-Betwa link? What are the legal problems with the approval granted to the KBLP? Discuss how it will impact Panna Tiger Reserve?
25. 'Terrorist crimes, cybercrimes, drug trafficking, etc, are important subjects. But if we neglect the issues at the level of the police station, it will be like raising a superstructure on foundations of sand.' Elaborate.
26. Why is the Japanese government flushing 1.25 million tonnes of wastewater into the Pacific Ocean? How will this discharge affect the ocean? Has the TEPCO treated the water? What impact will this decision have globally?
27. 'Despite several challenges to its democracy, the embedded values of India's constitutional morality have played a pivotal role in strengthening it.' Illustrate.
28. Are provisions of the Prevention of Child Marriage Act being diluted by custom and personal laws? What are the consequences of girls getting married before they become adults? What needs to be done to prevent child marriage?

## 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. (c)  | 16. (a)  | 17. (b)  | 18. (c)  | 19. (d)  | 20. (a)  |
| 21. (a)  | 22. (b)  | 23. (c)  | 24. (d)  | 25. (a)  | 26. (a)  | 27. (b)  | 28. (c)  | 29. (d)  | 30. (a)  |
| 31. (a)  | 32. (b)  | 33. (c)  | 34. (d)  | 35. (a)  | 36. (a)  | 37. (b)  | 38. (c)  | 39. (d)  | 40. (a)  |
| 41. (a)  | 42. (b)  | 43. (c)  | 44. (d)  | 45. (a)  | 46. (a)  | 47. (b)  | 48. (c)  | 49. (d)  | 50. (a)  |
| 51. (a)  | 52. (b)  | 53. (c)  | 54. (d)  | 55. (a)  | 56. (a)  | 57. (b)  | 58. (c)  | 59. (d)  | 60. (a)  |
| 61. (a)  | 62. (b)  | 63. (c)  | 64. (d)  | 65. (a)  | 66. (a)  | 67. (b)  | 68. (c)  | 69. (d)  | 70. (a)  |
| 71. (a)  | 72. (b)  | 73. (c)  | 74. (d)  | 75. (a)  | 76. (a)  | 77. (b)  | 78. (c)  | 79. (d)  | 80. (a)  |
| 81. (a)  | 82. (b)  | 83. (c)  | 84. (d)  | 85. (a)  | 86. (a)  | 87. (b)  | 88. (c)  | 89. (d)  | 90. (a)  |
| 91. (a)  | 92. (b)  | 93. (c)  | 94. (d)  | 95. (a)  | 96. (a)  | 97. (b)  | 98. (c)  | 99. (d)  | 100. (a) |
| 101. (a) | 102. (b) | 103. (c) | 104. (d) | 105. (a) | 106. (a) | 107. (b) | 108. (c) | 109. (d) | 110. (a) |
| 111. (a) | 112. (b) | 113. (c) | 114. (d) | 115. (a) | 116. (a) | 117. (b) | 118. (c) | 119. (d) | 120. (a) |
| 121. (a) | 122. (b) | 123. (c) | 124. (d) | 125. (a) | 126. (a) | 127. (b) | 128. (c) | 129. (d) | 130. (a) |
| 131. (a) | 132. (b) | 133. (c) | 134. (d) | 135. (a) | 136. (a) | 137. (b) | 138. (c) | 139. (d) | 140. (a) |



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