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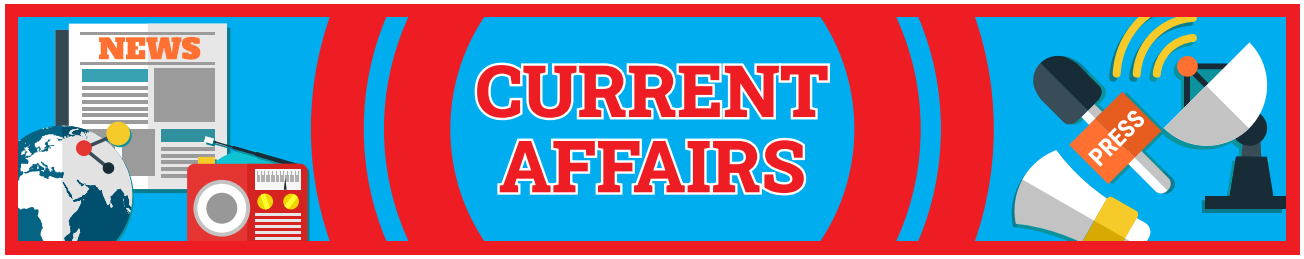


POLITY & GOVERNANCE

SEDITION LAW CAN BE RETAINED BUT WITH SAFEGUARDS, LAW COMMISSION

Why in news?

- The Section 124A of the Indian Penal Code (IPC) dealing with sedition needs to be retained but certain amendments could be made for greater clarity regarding its usage, the 22nd Law Commission has said in its recent report.
- The commission said sedition being a "colonial legacy" is not a valid ground for its repeal but in view of the misuse of Section 124A, the panel has recommended that the Centre issue model guidelines to curb any misuse.

Term of reference:

- The Law Commission received a reference from the Home Ministry through a letter dated March 29, 2016, addressed to the Department of Legal Affairs in the Law Ministry for a study of the usage of the provision of Section 124A and suggest amendments.

Observations by Law Commission:

- The Law Commission said the existence of laws such as Unlawful Activities (Prevention) Act (UAPA) and the National Security Act (NSA) does not by implication cover all elements of the offence envisaged under Section 124A of the IPC.
- Further, in the absence of a provision like Section 124A of IPC, any expression that incites violence against the government would invariably be tried under the special laws and counter-terror legislation, which contain much more stringent provisions to deal with the accused.

Question of colonial legacy:

- The report pointed out that it is often said that the offence of sedition is a colonial legacy based on the era in which it was enacted, especially given its history of usage against India's freedom fighters.
- However, going by that virtue, the entire framework of the Indian legal system is a colonial legacy. The police force and the idea of an All-India Civil Service are also temporal remnants of the British era. Merely ascribing the term 'colonial' to a law or institution does not by itself ascribe to it an idea of anachronism.
- The colonial origins of a law are by themselves normatively neutral. The mere fact that a particular legal provision is colonial in its origin does not ipso facto validate the case for its repeal.

Guidelines to prevent misuse:

- It is imperative to lay down certain procedural guidelines for curbing any misuse of Section 124A of IPC by the law enforcement authorities, any allegation of misuse of this provision does not by implication warrant a call for its repeal," it said.
- It noted that there are plethora of examples of various laws being misused by ill-intentioned individuals only to settle their scores in cases of personal rivalries and vested interests and even the Supreme Court recognised the same in a number of decisions.
- However, any alleged misused can be reined in by laying down procedural safeguards.

UGC (INSTITUTIONS DEEMED TO BE UNIVERSITIES) REGULATIONS, 2023

Why in news?

- Recently, Ministry of Education released the UGC (Institutions Deemed to be Universities) Regulations, 2023.

Background (UGC Act 1956 – 2020):

- The UGC Act 1956 provides for Central Government to declare any institution other than a University to a status of Institution Deemed to be University as if it

were a university within the meaning of Section 2(f). Upon declaration, such institution shall be deemed to be a university.

- The procedure for the declaration of status (General) & De Novo, the establishment of off-campus centre, minimum eligibility to acquire the status, its governance, etc. are regulated by UGC Regulations. The first set of Regulations was notified in the year 2010, which was revised in 2016 and 2019.
- With the announcement of the National Education Policy 2020 and in order to make the Regulations simple the UGC constituted an expert committee to review and revise the Regulations.
- The draft Regulations passed through several stages in the process of finalization. The expert committee's guidance, public feedback, and suggestions of the Commission are all taken into consideration before sending the final draft Regulations to the Ministry of Education for concurrence.
- Superseding the UGC (Institutions Deemed to be Universities) Regulations 2019, the new Regulations are built on the principle of a "light but tight" regulatory framework envisioned in the National Education Policy 2020.

Salient features of the regulations are as follows:

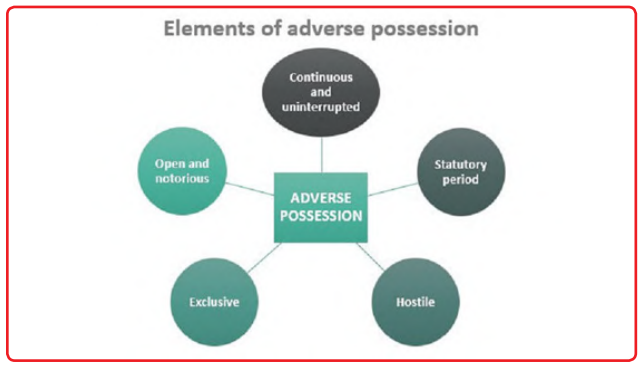
- Regulations are aligned with National Education Policy 2020. The objectives of the deemed to be universities, among other things, include providing higher education leading to excellence in different branches of knowledge, primarily at undergraduate, post-graduate, and research degree levels, fully conforming to the concept of a University, to strengthen the research ecosystem and to contribute for social transformation through socially responsive teaching, learning, research, and fieldwork.
- The eligibility criteria to apply for deemed to be university status is NAAC 'A' grade with at least a 3.01 CGPA for three consecutive cycles or NBA accreditation for two third of eligible programmes for three consecutive cycles or in the top 50 of any specific category of NIRF for the last three years continuously or in top 100 of overall NIRF Ranking for last three years continuously.
- A cluster of institutions managed by more than one sponsoring body can also apply for deemed to be university status.
- Sponsoring bodies seeking deemed to be university status to their institutions may apply 'online'. The Expert Committee assesses the facilities, interacts with stakeholders, and verifies the documents, all in virtual mode.
- Institution deemed to be University may start new courses or programmes in any field in their existing campus and approved off-campus centres, with the prior approval of its Executive Council and, also wherever applicable, with the approval of the relevant statutory council.
- An existing institution or an institution starting from the beginning with the focus on teaching and research in unique disciplines and/or addressing the strategic needs of the country or engaged in the preservation of Indian cultural heritage or preservation of the environment or dedicated to Skill Development or dedicated to Sports or languages or any other discipline(s), so determined by the Expert Committee of Commission, will be considered under 'Distinct Institution' category. Such Institutions will be exempted from eligibility criteria.
- Institutions deemed to be Universities with minimum 'A' grade and above or ranked from 1 to 100 in the "Universities" category of NIRF rankings of the relevant year are eligible to set up off-campus centres. Institutions declared as deemed to be Universities under a "distinct category" can apply for off-campuses after five years of their declaration if they are accredited with an A grade or figured in the top 100 in the "universities" category of NIRF.
- The Regulations are quality-focused. Deemed to be Universities with NAAC less than an 'A' grade or ranked more than 100 in the current NIRF ranking (Universities category) will be monitored on the academic parameters by UGC Expert Committee.
- The institutions deemed to be Universities shall follow the rules and regulations regarding fee structure, number of seats, etc., issued by the relevant statutory bodies, and in case an institution deemed to be University offers different courses which come under the regulatory ambit of different statutory bodies, namely the University Grants Commission, the All India Council of Technical Education, National Medical Council, etc., the rules and regulations regarding fee structure, number of seats, etc., issued by such statutory body concerned shall be applicable.
- The institution deemed to be University may provide fee concession or scholarships or may allocate seats to meritorious students belonging to socially and economically deprived groups of the society.
- The institutions deemed to be Universities shall compulsorily create Academic Bank of Credits (ABC) identities of their students and upload their credit scores in digital lockers and ensure that the credit scores are reflected in ABC portal and adopt Samarth e-Gov. Further, institutions can offer Twinning Programmes, Joint Degree Programmes, and Dual Degree Programmes in accordance with the provisions stipulated in the regulations concerned.
- Transparency in the functioning of the deemed to be university helps build a stronger relationship between students and institutions. The regulatory provisions enable institutions to be more transparent.

Way Forward:

- The new simplified guidelines will encourage universities to focus on quality & excellence, strengthen the research ecosystem and have a long-

term impact in transforming our higher education landscape.

ADVERSE POSSESSION



Why in news?

- Recently, the 22nd Law Commission in its recent report said there is no justification for introducing any change in the law relating to adverse possession.

Details:

- The Law Commission, headed by former Chief Justice of Karnataka High Court Ritu Raj Awasthi and comprising retired Kerala High Court judge KT Sankaran, said in its 280th report that there is no reason for increasing the period of limitation.
- However, two of its ex officio members filed a dissent note stating that the law does not stand judicial scrutiny and "promotes false claims under the colour of adverse possession".

What is adverse possession?

- The concept of adverse possession stems from the idea that land must not be left vacant but instead, be put to judicious use. Essentially, adverse possession refers to the hostile possession of property, which must be continuous, uninterrupted, and peaceful.
- The rationale behind this comes from considerations that the "title to land should not long be in doubt", "society will benefit from someone making use of land the owner leaves idle," and "persons who come to regard the occupant as owner may be protected."
- The maxim that the law does not help those who sleep over their rights is invoked in support of adverse possession. The original title holder who neglected to enforce his rights over the land cannot be permitted to re-enter the land after a long passage of time.

Concept:

- While the concept originally dates back to 2000 BC, finding its roots in the Hammurabi Code, the historical basis of "title by adverse possession" is the development of the statutes of limitation on actions for recovery of land in England. The first such statute was the Statute of Westminster, 1275.
- However, it was the Property Limitation Act, 1874, that set the period of limitation at twelve years from when the cause of action first arose, which laid the groundwork for the limitations model inherited by colonial India.
- The first attempt to bring the law of limitation to domestic shores was the "Act XIV of 1859", which regulated the limitation of civil suits in British India. After the passage of the Limitation Act in 1963, the law on adverse possession underwent significant changes.

What provisions did the Limitation Act, 1963 bring with it?

- The 1963 Act fortified the position of the true owner of the land, as he now had to merely prove his title, while the burden of proof of adverse possession shifted to the person claiming it.
- Under the Limitation Act, 1963, any person in possession of private land for over 12 years or government land for over 30 years can become the owner of that property, as laid down in Articles 64, 65, 111, or 112 of the 1963 Act, relating to suits for possession of immovable property.
- According to Article 65 of Schedule I of the 1963 Act, a person in adverse possession of immovable property acquires title to that property. However, the possession must be open, continuous, and "in defiance of the title of the real owner for twelve years." Similarly, Article 64 governs suits for possession based on previous possession and not on title.
- Meanwhile, Article 112, which applies to government property, mandates a requirement of 30 years for granting a title by adverse position.
- Further, Article 111 says that the limitation period for the State will be 30 years from the date of dispossession for land belonging to a private person where any public street or road or any part of it has been dispossessed and no suit has been moved for its possession "by or on behalf of any local authority".

What are the main ingredients of adverse possession?

- In the 2004 Apex Court ruling in Karnataka Board of Wakf v Government of India, the court dealt with the ingredients of adverse possession.
- According to the observations made by former SC judge S. Rajendra Babu in the case, "A person who claims adverse possession should show: (a) on what date he came into possession, (b) what was the nature of his possession, (c) whether the factum of possession was known to the other party, (d) how long his possession has continued, and (e) his possession was open and undisturbed."
- For the adverse possession to be "open," or without any attempt at concealment, it doesn't need to be brought to the specific knowledge of the owner. However, such a requirement may be insisted on where an ouster of title is pleaded.
- Further, the mandate for such possession to be "undisturbed" requires a "consistent course of conduct, which means that it cannot be shown by

a "stray or sporadic act of possession." In the 1981 ruling in Kshitish Chandra Bose vs. Commissioner of Ranchi, the SC delineated the requirements of openness and continuity.

- However, in a series of decisions, the SC recommended that the government seriously consider the issue of "adverse possession" and make suitable changes.

Why did the SC suggest changes to the law on adverse possession?

- A two-judge SC bench, in its 2008 ruling in Hemaji Waghaji Jat v. Bhikhabhai Khengarbhai Harijan and Others, while dealing with Article 65 of the Schedule of the Limitation Act, 1963, observed that the law of adverse possession "ousts an owner on the basis of inaction within limitation" and is "irrational, illogical, and wholly disproportionate".
- Emphasising the "urgent need" for "a fresh look regarding the law on adverse possession", the court recommended the government "to seriously consider and make suitable changes in the law of adverse possession".
- Following this, on December 19, 2008, a reference was made to the Law Commission by the Ministry of Law and Justice, requesting it to examine the matter and furnish its report on the same.
- Owing to the importance of the subject, coupled with the fact that the reference had been pending since 2008, the present Law Commission found it "expedient to deliberate afresh over the subject."
- While the Commission's opinion was that the law on adverse possession should stay the same, two of its ex officio members, filed a dissent note saying that the law promotes false claims.

What did the dissent note say?

- Asserting that courts have rarely ruled in favour of adverse possession owing to its contradictory requirement that the nature of possession is "peaceful as well as hostile", the dissenting opinion said that the law should be struck off.
- Citing troubles that true owners have been subjected to, such as "avoidable and expensive litigation" by unscrupulous persons" who are acquainted with fraud, that the already overburdened machinery of the courts is further saddled with avoidable work, much to the misery of the litigants.
- If the law of adverse possession is struck off from the Limitation Act it will not hinder anybody's right nor will it cause any neglect of land resources.

'SEXUAL INTENT' IN POCSO, DEFINITION OF OBSCENITY, WHY KERALA HC THREW OUT CASE AGAINST ACTIVIST

Why in news?

- Kerala High Court recently, quashed a case filed under the POCSO Act, India's child protection law, against a woman accused of subjecting her children to an obscene act.

- The mere sight of a woman's naked upper body should not be deemed sexual by default and it should be considered in the context in which it was published, the court observed.

What was the POSCO case?

- In June 2020, a Kerala-based women's rights activist, posted a video on social media that showed her two children, aged 14 and 8 years, painting on her "semi-nude torso" with the hashtag "Body Art and Politics".
- There was outrage, and she was accused of subjecting her children to an obscene act.
- Police registered a case, and in a final report filed at the Additional Sessions Court, Ernakulam, charged her with offences under Sections 10 read with Section 9 (n), Section 14 read with Section 13 (b), and Section 15 of the Protection of Children from Sexual Offences (POCSO) Act, 2012.
- The offences under Section 9 (n), read with Section 10, involve sexual assault by a child's relative. Sections 13-14 are about using children for pornographic purposes and its punishment. Section 15 of the Act lays down the punishment for storing child pornographic material.
- The Ernakulam court granted her bail but refused to discharge her, reasoning that there were grounds for assuming she committed the offences.

IT Act and JJ Act:

- The police also charged the activist under Section 67B (a), (b), and (c) of the Information Technology (IT) Act, 2000, and Section 75 of the Juvenile Justice (JJ) Act, 2015.
- Section 67B (a) (b) and (c) of the IT Act lays down the punishment for publishing or electronically transmitting obscene material, which depicts children in sexually explicit acts.
- Section 67B (a) is attracted when the material depicts children engaged in sexually explicit acts, and Section 67(B) (b) is attracted when children are depicted in an obscene, indecent, or sexually explicit manner.
- Section 67B (c) is about the cultivation, enticement, or induction of children into online relationships for sexually explicit acts.

- Section 75 of the JJ Act prescribes punishment for cruelty to children, which includes assaulting, abandoning, abusing, exposing, and wilfully neglecting them to cause unnecessary mental or physical suffering.

Highlights of the judgement:

- After viewing the video, the court said that although it showed the activist's son painting her chest, the crucial question was whether there was any sexual intent on the mother's part.
- Dismissing the POCSO charges against her, the court said that Sections 9 (n) and 10 are attracted when a child's relative commits "sexual assault". However, "sexual assault" under Section 7 of the Act requires "sexual intent" while touching the child's private parts or making the child touch one's own or another person's private parts.
- It also includes "any other act with sexual intent" involving physical contact, without penetration, the court said.
- Quashing the POCSO charges under Sections 13 (b) and 14 of the Act that involve using children for sexual gratification in any form of media, the court said, "there is nothing to show that the children were used for pornography."
- On the use of Section 15 (punishment for storing pornographic material involving children), the court said the children in the video were clothed, and participating in a harmless and creative activity.
- Observing that the lower court had "completely overlooked the context" in which the video was published, the High Court discharged the activist of the remaining charges under the IT and JJ Act(s). "There is no sufficient ground for proceeding against the petitioner".

Bodily autonomy:

- "Bodily autonomy", the court said, meant the freedom to make one's own choices about their body, but "this right is diluted or denied to the fairer sex". Relying on the Supreme Court's 2018 ruling in 'Joseph Shine v. Union of India', the court underlined women's autonomy as a facet of human dignity.
- In 'K.S. Puttaswamy v Union of India' (2017), a nine-judge Bench of the Supreme Court unanimously recognized the right to privacy as a fundamental right under Article 21 of the Constitution, and declared bodily autonomy to be an integral part of it, the court said.
- Clearing the accused of charges under Sections 67B (a), (b), and (c) of the IT Act, the court said that Section 67B (b) is attracted only when the material "depicts children in an obscene or indecent, or sexually explicit manner".

Definition of obscenity:

- The court referred to the Constitution Bench ruling in 'Ranjit D. Udeshi v. State of Maharashtra' (1965) where the Supreme Court followed the 'Hicklin test' that was laid down in the 1868 ruling in the UK, 'Queen vs. Hicklin'.
- The test is whether the "tendency of the matter charged as obscene must be to deprave and corrupt those, whose minds are open to such immoral influences and into whose hands a publication of the sort may fall," the top court had said, holding D H Lawrence's book, 'Lady Chatterley's Lover', to be 'obscene' under Section 292 of the Indian Penal Code, 1860, which punishes the sale of obscene books, pamphlets, etc.
- However, in 2014, in its ruling in 'Aveek Sarkar v. State of Bengal', the top court applied the contemporary community standards test, which says 'obscenity' should be gauged according to standards that "reflect the sensibilities" and "tolerance levels of an average reasonable person".
- In the 'Aveek Sarkar' case, Sportsworld magazine and Kolkata-based newspaper Anandabazar Patrika reproduced an article alongside a nude photograph of tennis star Boris Becker and his wife that was originally published in the German magazine Stern. This led a lawyer to file a case against the editors of the publications under Section 292 IPC. However, the court held that a nude picture cannot be called obscene unless it tends to arouse feelings or reveal an overt sexual desire.
- In the 1996 case 'Bobby Art International v. Om Pal Singh Hoon and Others', the top court said that depicting nudity and sexual violence in the film 'Bandit Queen' did not amount to obscenity as it was done to underscore a social reality.
- Observing that the film's "objectionable scenes" must be considered in the context of the message that it was trying to send, the court allowed the film's release.

Conclusion:

- The Kerala High Court asserted that "nudity and obscenity are not always synonymous", and it was wrong to consider nudity immoral.
- This is a State where women of certain lower castes had once fought for the right to cover their breasts. We have murals, statues, and art of deities displayed in the seminude in ancient temples" all over the country, the court said, adding that such paintings are considered artistic, or even holy.
- "Even though the idols of all Goddesses are bare-chested, when one prays at the temple, the feeling is not of sexual explicitness but of divinity," the court said while providing examples of men's body painting traditions during Puli Kali folk festivals and Theyyam rituals in Kerala.
- Lamenting the double standards that allow men to walk around without shirts while women's bodies are "overly sexualised" and construed as something "meant for erotic purposes", the court said that Rehana's intention was to expose precisely these double standards.

UNIFORM CIVIL CODE, WHAT IS IT AND WHAT ARE THE ARGUMENTS AGAINST IT?

Why in news?

- The 22nd Law Commission of India recently sought fresh suggestions from various stakeholders, including public and religious organisations on the Uniform Civil Code (UCC).
- The commission sought suggestions as the consultation paper issued by the previous law commission on the subject was more than three years old.
- UCC calls for the formulation of one law for India, which would be applicable to all religious communities in matters such as marriage, divorce, inheritance, maintenance, and adoption.

What is UCC?

- The term 'Uniform Civil Code' is mentioned in Part IV, Article 44 of the Indian Constitution. Article 44 states that "the State shall endeavour to secure for the citizens a uniform civil code throughout the territory of India".
- Part IV of the Constitution outlines the Directive Principles of State Policy, which, while not enforceable or justiciable in a court of law, are fundamental to the country's governance.
- The objective of Article 44 was to address discrimination against vulnerable groups and harmonise diverse cultural groups across the country.
- Dr B R Ambedkar, while formulating the Constitution, had said that a UCC is desirable but, for the moment, it should remain voluntary, and thus Article 35 of the draft Constitution was added as a part of the Directive Principles of the State Policy in Part IV of the Constitution of India as Article 44.
- It was incorporated in the Constitution as an aspect that would be fulfilled when the nation would be ready to accept it and the social acceptance to the UCC could be made.

Origin of the Uniform Civil Code

- The debate for a uniform civil code dates back to the colonial period in India. In 1835, the British government tried to reform local social and religious customs and stressed upon the need for uniformity in the codification of Indian law relating to crimes, evidence, and contracts, specifically recommending that personal laws of Hindus and Muslims be kept outside such codification.
- Under the East India Company, the Muslim Personal Law (Shariat) Application Act was passed in 1937 to formulate an Islamic law code for Indian Muslims. It had no uniformity in its application at lower courts due to the diversity of the local cultures of Muslims in different parts of India.
- The increase in legislation by British rule forced the government to form the B N Rau Committee to codify the Hindu law in 1941. The task of the Hindu Law Committee was to examine the question of the necessity of common Hindu laws.
- The committee recommended a codified Hindu law, which would give equal rights to women. The 1937 Act was reviewed and the committee recommended a civil code of marriage and succession for Hindus.

Mohd Ahmed Khan vs Shah Bano Begum case (1985)

- Shah Bano (73) was divorced by her husband through triple talaq, and she was denied maintenance. She approached the court demanding maintenance for herself and her five children after her divorce from her husband.
- The Supreme Court ruled in her favour under the "maintenance of wives, children and parents" provision (Section 125) of the All India Criminal Code, which applied to all citizens, irrespective of religion.
- Further, it recommended that a uniform civil code be set up. Following this, Bano's husband appealed in the Supreme Court, stating that he had fulfilled all his obligations under the Islamic law.
- After the court's judgement, nationwide meetings and agitations were held. Under pressure, the then government passed the Muslim Women's (Right to protection on divorce) Act (MWA) in 1986, which made Section 125 of the Criminal Procedure Code inapplicable to Muslim women.

Why are people opposing the UCC?

- The main argument against the UCC is that it violates the constitutional freedom to practice the religion of choice, which allows religious communities to follow their respective personal laws. For example, Article 25 gives every religious group the right to manage its own affairs, and Article 29 gives them the right to conserve their distinct culture.
- Secondly, it is argued that if codified civil laws and criminal laws such as the Code of Criminal Procedure (CrPC) and the Indian Penal Code (IPC) don't follow 'one nation, one law', then how can this diktat be applied to personal laws of communities? For example, the law of anticipatory bail differs from one state to another.
- Experts argue that the UCC will impose a 'Hinduised' code for all communities. For example, a UCC could

include provisions for family disputes on property inheritance, which may be in line with Hindu customs and will legally force other communities to follow the same.

- The UCC is likely to bring multiple changes to the Muslim Personal Law, including the abolition of polygamy practices.
- However, some experts feel that a uniform civil code will help in integrating India more than it has ever been since independence. It will help in bringing Indians, regardless of their caste, religion or tribe, under one national civil code of conduct. They also feel that a UCC will help in improving the condition of women in India.

Has any state implemented the UCC?

- UCC is in force only in the state of Goa. The Goa Civil Code was given by the Portuguese in 1867.
- However, Uttarakhand is set to be the first state in post-Independent to implement UCC. The Bharatiya Janata Party (BJP) has vowed to implement UCC in Assam and Gujarat as well.

What has the Law Commission said?

- In 2016, the Union government had requested the Law Commission of India to determine how to form a code in the presence of "thousands of personal laws" in the country.
- In 2018, the Law Commission submitted a 185-page consultation paper on the reform of family law. The paper stated that a unified nation did not necessarily need "uniformity", adding that secularism could not contradict the plurality prevalent in the country. The Commission noted that the term "secularism" had meaning only if it assured the expression of any form of difference.
- While saying that a UCC "is neither necessary nor desirable at this stage", the Law Commission recommended that discriminatory practices, prejudices, and stereotypes within a particular religion and its personal laws should be studied and amended.
- Some of these amendments include fixing the marriageable age for boys and girls at 18 years so that they are married as equals, making adultery a ground for divorce for men and women and simplifying the divorce procedure.

NITI AAYOG AND THE UNITED NATIONS SIGN THE GOI UNSDCF 2023-2027 FRAMEWORK

Why in news?

- NITI Aayog and the United Nations in India signed the Government of India - United Nations Sustainable Development Cooperation Framework 2023-2027 recently.

What is GoI-UNSDCF 2023-2027?

- GoI-UNSDCF 2023-2027 represents the UN development system's collective offer to the Government of India, in line with the national vision for development, for the achievement of the Sustainable Development Goals, promoting gender equality, youth empowerment and human rights.

- The UN General Assembly Resolution designates the United Nations Sustainable Development Cooperation Framework as the principal planning and implementation instrument for the UN Development System at country level.
- Programme priorities of the UN entities working at the country are derived from the GoI-UNSDCF.

Strategic pillars:

- The GoI-UNSDCF 2023-2027 is built on four strategic pillars derived from the 2030 Agenda – People, Prosperity, Planet and Participation.
- The four interlinked pillars have six outcome areas focusing on
  a) Health and Well Being;
  b) Nutrition and Food Security;
  c) Quality Education;
  d) Economic Growth and Decent Work;
  e) Environment, Climate, WASH and Resilience; and
  f) Empowering People, Communities, and Institutions.

SDG localisation & South-South cooperation:

- To further deepen cooperation in critical areas, for the first time, the GoI-UNSDCF will have specific focus on SDG localisation and South-South cooperation, in line with India's leadership towards the implementation and acceleration of the SDGs; and India's championing of South-South cooperation. Showcasing Indian models of development globally will be central to the effort.

Implementation:

- The implementation, monitoring and reporting of GoI-UNSDCF 2023-2027 will be co-led by Government of India and the United Nations, India through a Joint Steering Committee.

Way Forward:

- The new Framework comes at a critical juncture as the world reaches the halfway mark to achieve the 2030 Agenda for Sustainable Development, and India envisions a 'Viksit Bharat' over the next 25 years.

CHILDLINE 1098 TO BE MERGED WITH 112 LINE IN 9 STATES

Why in news?

- In a first, the Women and Child Development (WCD) Ministry has decided to do away with the concept of NGOs running Childline (a counselling and distress relief helpline for children) which has been attending to children under emergency since 1995.

Key Highlights:

- In the first phase, the Ministry has merged the 1098 helpline with the 112 Emergency Response Support System (ERSS) in nine States Union Territories where operations will start by June-end.
- They are Andhra Pradesh, Arunachal Pradesh, Bihar, Dadra and Nagar Haveli & Daman & Diu, Gujarat, Goa, Ladakh, Mizoram and Puducherry. The others will be on board in a phased manner.
- The merger was being done as part of the broader vision of "One nation, one helpline". Hence, Childline (1098) is being merged with the ERSS-112.

Standard Operating Procedures (SoPs) for the merger:

- The States had to ensure a dedicated 24x7 WCD Control Room which will be integrated with the ERSS.
- Further, at the district level, the Child Helpline (CHL) unit at the District Child Protection Unit will be available round the clock to provide outreach services for children in crisis, linking them to emergency and long-term care and rehabilitation services.

Helpdesk at stations:

- The States and Union Territories, as per the SoPs of Railways, would continue setting up child helpdesks or booths at selected railway stations and bus stands.
- The Ministry has entrusted the Centre for Development of Advanced Computing, Kerala as a total solution provider for automation of Child Helpline 1098 and its integration with the ERSS-112.
- The incoming calls to 1098 will be classified into three categories: emergency, non-emergency and information calls.
- All emergency calls can be forwarded from 1098 to 112 or vice versa at the switch of a button.

Childline India Foundation (CIF):

- The Ministry, under the erstwhile Child Protection Services Scheme, was supporting the 24x7 helpline Childline service, through Childline India Foundation (CIF) and its partner NGOs.
- The CIF had been rendering Childline Services in 568 districts, 135 railway stations and 11 bus stands through its network of 1,000-plus units.
- The CIF network could cover only 568 districts which had left almost 200 districts uncovered under Childline, which is why the decision of merger of Childline was taken.

INTERNATIONAL RELATIONS

INDIA, US FINALISE ROADMAP FOR FAST TRACKING DEFENCE TECHNOLOGY TRANSFER

Why in news?

- India and the US recently concluded an ambitious roadmap for defence industrial cooperation to fast-track technology tie-ups and co-production of military platforms such as air combat and land systems, a move that comes in the wake of China's increasingly aggressive behaviour in the Indo-Pacific region.
- The new framework for cooperation was finalised during talks between Defence Minister Rajnath Singh and his visiting American counterpart Lloyd Austin.

Key Highlights:

- They decided to initiate negotiations on a framework for the security of supply arrangement and a reciprocal defence procurement agreement, which will promote long-term supply chain stability.
- The initiative aims to change the "paradigm" for cooperation between the US and Indian defence sectors, including the implementation of a set of specific proposals that could provide India access to cutting-edge technologies and support its defence modernisation plans.
- They also committed to strengthening operational collaboration across all military services, with an eye to supporting India's leading role as a security provider in the Indo-Pacific.

- US welcomed India's leadership role in the Quad Indo-Pacific Maritime Domain Awareness Initiative (IPMDA), which will provide cutting-edge domain awareness capability to countries across the Indo-Pacific region.

INDUS-X:

- They welcomed the establishment of the India-US Defence Acceleration Ecosystem (INDUS-X), a new initiative to advance cutting-edge technology cooperation.
- The initiative, which will be launched by the US-India Business Council on June 21, is designed to complement existing government-to-government collaboration by promoting innovative partnerships between US and Indian companies, investors, start-up accelerators, and academic research institutions.

Defence Secretary level talks:

- The US defence secretary also held separate talks with National Security Advisor.
- Both sides will identify opportunities for the co-development of new technologies and the co-production of existing and new systems besides facilitating increasing collaboration between defence start-up ecosystems of the two countries.
- Towards these objectives, they concluded a roadmap for US-India defence industrial cooperation which shall guide the policy direction for the next few years.
- The new roadmap will "fast-track technology cooperation and co-production in areas such as air combat and land mobility systems; intelligence, surveillance, and reconnaissance; munitions; and the undersea domain.

iCET:

- In a major move, US President and Indian Prime Minister announced in May 2022, the US-India initiative on Critical and Emerging Technology (iCET) to elevate and expand the strategic technology partnership and defence industrial cooperation between the two countries.
- The iCET is expected to forge closer linkages between the government, academia and industry of the two countries in areas such as artificial intelligence, quantum computing, 5G and 6G, biotech, space and semiconductors.
- The India-US defence and strategic ties have been on an upswing in the last few years.

Defence Pacts:

- The two countries have inked key defence and security pacts over the past few years, including the Logistics Exchange Memorandum of Agreement (LEMOA) in 2016 that allows their militaries to use each other's bases for repair and replenishment of supplies.
- The two sides also signed COMCASA (Communications Compatibility and Security Agreement) in 2018 which provides for interoperability between the two militaries and provides for the sale of high-end technology from the US to India.
- In October 2020, India and the US sealed the BECA (Basic Exchange and Cooperation Agreement) agreement to further boost bilateral defence ties.
- The pact provides for sharing of high-end military technology, logistics and geospatial maps between the two countries.

WHY IS THERE TROUBLE IN KOSOVO AGAIN?

Why in news?

- In the aftermath of one of the worst escalation of tensions between Kosovo and Serbia in at least a decade, the North Atlantic Treaty Organization (NATO) recently sent 700 more of its peacekeeping troops to Kosovo.

Details:

- Clashes broke out between Serbs protesting in North Kosovo and the NATO-led Kosovo Force (KFor), leaving about 30 NATO soldiers and 50 Serbs injured.
- Since then, the Presidents of Serbia and Kosovo have met once under pressure from the European Union (EU) in the presence of French and German leaders. However, a resolution to the long-standing conflict remains uncertain.

What are the roots of the conflict?

- Both Kosovo and Serbia lie in the Balkans, a region of Europe made up of countries that were once a part of the erstwhile Republic of Yugoslavia. Kosovo, a former province of Serbia, unilaterally declared Independence in 2008 and is recognised as a country by about 100 nations including the U.S. and a number of EU-member countries.
- Serbia, however, does not recognise Kosovo's sovereignty and continues to consider it as a part of itself despite having no administrative control over it.

Historical aspect:

- The Serbian Empire had gained control of Kosovo in the 12th century, and the latter went on to become

the heart of the kingdom with several Serb Orthodox Christian churches and monasteries of significance being built in Kosovo.

- Serbia lost Kosovo for 500 years to the Ottoman Empire in the 1389 Battle of Kosovo. During the Ottoman Rule, the ethnic and religious balance shifted in Kosovo, leading it to become a majority ethnic Albanian region with Muslims.
- After five centuries of Ottoman rule, Kosovo became part of Serbia in the early 20th century and post the Second World War, it was eventually made a province (with autonomy) of Serbia, which was then one of the six republics of Yugoslavia.
- Serbia considered this the rightful return of Kosovo, but the ethnic Albanians, who currently make up 90% of Kosovo's population considered it unfair. In the 1980s, Kosovo Albanians increasingly mobilised and sought separation from Serbia.

1990s afterwards:

- In the late 1990s, the Kosovo Liberation Army (KLA), consisting mainly Kosovo Albanians, led an insurgency against the Serbian rule of Kosovo. Serbia responded by cracking down on the rebellion by deploying heavy forces in 1998 and 1999. Nearly 13,000 lives, mainly of ethnic Albanians, were lost during this period.
- However, in 1999, NATO intervened by carrying out air raids and bombardment of Serb targets, forcing Serbia to end hostilities and pull out of Kosovo. Subsequently, NATO deployed 50,000 peacekeepers and through the UN Security Council (UNSC) Resolution 1244, a transitional UN-led administration began to head Kosovo.
- In 2008, Kosovo declared independence from Serbia. While Serbia challenged Kosovo's actions before the International Court of Justice (ICJ), the ICJ was of the opinion that Kosovo's declaration was not against international law.

What has happened since 2008?

- Currently, an ethnic Serb minority of more than 50,000 resides in multiple municipalities in the northern part of Kosovo bordering Serbia, making up about 5.3% of the country's population. The Kosovo Serbs do not recognise Kosovo state institutions, receive pay and benefits from Serbia's budget, and pay no taxes either to Pristina, the capital of Kosovo or Belgrade, the Serbian Capital.
- Since 2008, clashes have broken out on and off in Kosovo's northern region, either when Serbs have clashed with Kosovo's police or due to the larger issue of Serbia not recognising Kosovo's independent status.
- Meanwhile, Kosovo cannot become a member country of the UN without Serbia's approval as it has its diplomatic allies in Russia and China who would veto such a decision.
- In 2011, EU, backed by the U.S, initiated talks to resolve the conflict between the two countries, offering the prospect that the two could only become a part of the EU if they bilaterally normalised relations.
- In 2013, the two reached the Brussels Agreement brokered by the EU, which included measures to dismantle Serbia-backed parallel structures in Kosovo's north and the creation of the Association of Serb Municipalities to administratively link Kosovo's 10 Serb-majority municipalities. While the agreement was not fully implemented on the ground, the participation of Serbs in elections was facilitated.

What prompted the recent clashes?

- In April 2023, Kosovo held mayoral elections in municipalities. These elections were boycotted by ethnic Serbs in the northern municipalities and saw only about a 3% turnout, as a result of which ethnic Albanian mayors got elected in these municipalities.
- Notably, protesting the July 2022 move by Kosovo asking for a change of number plates, ethnic Serb mayors in northern municipalities, along with local judges and 600 police officers had resigned in November and opposed fresh elections to their posts.
- With the support of the Kosovo police, ethnic Albanian mayors took office in northern Kosovo's Serb-majority area and faced protests by Serbs. The move by Kosovo to install Albanian members led the U.S. and its allies to rebuke Pristina, as it triggered clashes.

Where do the resolution talks stand?

- In March 2023, both Serbia and Kosovo tentatively agreed to EU's plan which proposed that Belgrade should stop lobbying against Kosovo's candidature in international organisations including the United Nations. In turn, Kosovo was to form an association of Serb-majority municipalities.
- Additionally, both sides were to also open representative offices in each other's capital to help resolve outstanding disputes.
- However, the two parties eventually walked out of singing the deal as Kosovo's Prime Minister Albin Kurti faced nationalist opposition for not being assertive enough while Serbia's populist leader Mr.Vučić was criticised back home for engaging in a compromise.
- Talks have also stalled because both sides now doubt the EU's seriousness about granting them membership as many of the EU countries, including France, are against the bloc's further expansion.

What about Serbia's ties with Russia?

- Kosovo's current leader and the West are also concerned about Serbia's strong historic and military ties with Russia and its political closeness with President Vladimir Putin who has maintained support for the Serbian claim. The concerns have intensified after the start of the Ukraine conflict and

Mr. Kurti has warned of a spillover in the Balkans backed by Russia.

- Besides, Serbia's dependence on Russia for diplomatic support to counter Kosovo's bids at the UN puts Russia in a position of influence.

What next?

- Since the Presidents of both sides met on June 1, Kosovo has indicated that a solution for de-escalation is close and it is open to holding fresh elections in Serb dominant municipalities, provided they are held in a free and fair manner, without Belgrade pressuring ethnic Serbs to boycott the vote.

WHO REPORT HIGHLIGHTS SIGNIFICANT IMPACT OF 'HAR GHAR JAL' PROGRAM ON PUBLIC HEALTH AND ECONOMIC SAVINGS

Why in news?

- Recently, a groundbreaking report of WHO highlighting the substantial benefits of the 'Har Ghar Jal' program in India was released.

Focus:

- The 'Har Ghar Jal' report focuses on diarrheal diseases as they contribute significantly to the overall disease burden related to water, sanitation, and hygiene (WASH) issues.
- The analysis underscores the urgent need to address these diseases and the potential for substantial gains in public health and economic well-being.

Key Highlights:

- The report estimates that ensuring safely managed drinking water for all households in the country could avert nearly 400,000 deaths caused by diarrheal diseases and prevent approximately 14 million Disability Adjusted Life Years (DALYs) related to these diseases.
- This achievement alone would result in estimated cost savings of up to $101 billion.
- Prior to 2019, the situation of water supply in rural areas was challenging. The report reveals that in 2018, 36% of India's total population, including 44% of the rural population, lacked access to improved drinking-water sources on their premises.
- The direct consumption of unsafe drinking water had severe health and societal consequences. The analysis indicates that in 2019, unsafe drinking water, along with inadequate sanitation and hygiene, contributed to 1.4 million deaths and 74 million DALYs globally.

Related SDGs:

- The World Health Organization (WHO) monitors various Sustainable Development Goal (SDG) indicators, including the proportion of the population using safely managed drinking water services (Indicator 6.1.1) and mortality related to unsafe water, sanitation, and hygiene (Indicator 3.9.2).
- WHO has developed methods and tools to estimate the health gains associated with improvements in water, sanitation, and hygiene, particularly in reducing diarrheal diseases and other related health outcomes.

Universal coverage:

- The report emphasizes the tremendous time and effort saved for women and girls through the provision of tap water. In 2018, women in India spent an average of 45.5 minutes daily collecting water to meet household needs.
- Overall, households without on-premises water spent a staggering 66.6 million hours each day collecting water, with the majority (55.8 million hours) occurring in rural areas.
- Universal coverage through tap water provision will result in substantial savings by eliminating the need for daily water collection efforts.
- The rural tap water connections increased from 16.64% in 2019 to 62.84% within a span of 41 months, representing an average annual increase of 13.5% compared to a mere 0.23% per annum.

About 'Har Ghar Jal' programme:

- The Har Ghar Jal Programme, implemented by the Jal Jeevan Mission under the Ministry of Jal Shakti, was announced by Prime Minister Shri Narendra Modi on August 15, 2019.
- The program aims to provide every rural household with affordable and regular access to an adequate supply of safe drinking water through taps.
- The program's components align with the WHO/ UNICEF Joint Monitoring Programme for Water Supply, Sanitation, and Hygiene (JMP) to monitor progress on SDG 6.1 for safely managed drinking water services.

HAP TO TAKE AI GOVERNANCE GLOBAL

Why in news?

- The annual Group of Seven (G-7) Summit, hosted by Japan, took place in Hiroshima from May 19-21. Among other matters, the G-7 Hiroshima Leaders' Communiqué initiated the Hiroshima AI Process (HAP), an effort by this bloc to determine a way forward to regulate Artificial Intelligence (AI).

Details:

- The ministerial declaration of the G-7 Digital and Tech Ministers' Meeting, discussed "responsible AI" and global AI governance, and reaffirmed commitment to promote human-centric and trustworthy AI based on the OECD AI Principles and to foster collaboration to maximise the benefits for all brought by AI technologies.
- Even as the G-7 countries are using such fora to deliberate AI regulation, they are acting on their own instead of waiting for the outcomes from the HAP. So while there is an accord to regulate AI, the discord will also continue.

What is the Hiroshima AI process?

- The communiqué accorded more importance to AI than the technology has ever received in such a forum even as G-7 leaders were engaged with other issues like the war in Ukraine, economic security, supply chain disruptions, and nuclear disarmament.
- It said that the G-7 is determined to work with others to "advance international discussions on inclusive AI governance and interoperability to achieve our common vision and goal of trustworthy AI, in line with our shared democratic value".
- The HAP is likely to conclude by December 2023. The first meeting under this process was held on May 30. Per the communiqué, the process will be organised through a G-7 working group, although the exact details are not clear.

Why is the process notable?

- While the communiqué doesn't indicate the expected outcomes from the HAP, there is enough in there to indicate what values and norms will guide it and from where it will derive its guiding principles, based on which it will govern AI.
- The communiqué as well as the ministerial declaration also say more than once that AI development and implementation must be aligned with values such as freedom, democracy, and human rights. Values need to be linked to principles that drive regulation.
- To this end, the communiqué also stresses fairness, accountability, transparency, and safety. It spoke of "the importance of procedures that advance transparency, openness, and fair processes" for developing responsible AI.

What does the process entail?

- An emphasis on freedom, democracy, and human rights, and mentions of "multi-stakeholder international organisations" and "multi-stakeholder processes" indicate that the HAP isn't expected to address AI regulation from a state-centric perspective.
- Instead, it exists to account for the importance of involving multiple stakeholders in various processes and to ensure the latter are fair and transparent.
- The task before the HAP is really challenging considering the divergence among G-7 countries in, among other things, regulating risks arising out of applying AI.
- It can help these countries develop a common understanding on some key regulatory issues while ensuring that any disagreement doesn't result in complete discord.
- For now, there are three ways in which the HAP can move forward —
  a) it can enable the G-7 countries to move towards a divergent regulation based on shared norms, principles and guiding values;
  b) it can become overwhelmed by the divergent views among the G-7 countries and fail to deliver any meaningful solution; or
  c) it can deliver a mixed outcome with some convergence on certain issues and at the same time a lack of common ground on many others.

Way Forward:

- The G7 communiqué states that "the common vision and goal of trustworthy AI may vary across G7 members."
- The emphasis on working with others, including OECD countries and on developing an interoperable AI governance framework, suggests that while the HAP is a process established by the G-7, it still has to respond to the concerns of other country-groups as well as the people and bodies involved in developing international technical standards in AI.
- It is also possible that countries that aren't part of the G-7 would want to influence the global governance of AI, and may launch a process of their own like the HAP.
- Overall, the establishment of the HAP makes one thing clear: AI governance has become a truly global issue that is likely to only become more contested in the future.

INDIA, US TO ENHANCE TECH COMMERCE; TO FOCUS ON SEMICONDUCTOR, TELECOM

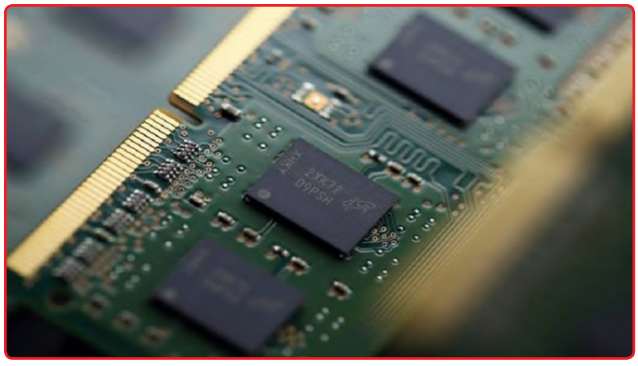
Why in news?

- Recently, a joint statement was released by the Indian Prime Minister and US President in the US.

Key Highlights:

- Both governments have committed to promote policies and adapt regulations to facilitate greater

technology sharing, co-development, and co-production opportunities between US and Indian industry, government, and academic institutions.



- India and US have signed multiple pacts to push bilateral commerce, technology transfer, joint development of technologies in the area of semiconductor, 5G and 6G telecom and open source based telecom network, quantum and high performance computing etc. as both nations enhance commitment towards trusted network and supply chain ecosystem.

New engagements:

- The hailed the signing of an MoU on Semiconductor Supply Chain and Innovation Partnership as a significant step in the coordination of our countries' semiconductor incentive programs.
- They welcomed computer memory chip maker Micron Technology's announcement to set up a semiconductor assembly and test facility in Gujarat entailing an investment of USD 2.75 billion with support from the Indian government. The plant is expected to create up to 5,000 new direct and 15,000 community jobs opportunities in next five years.
- They welcomed Lam Research's proposal to train 60,000 Indian engineers through its Semiverse Solution virtual fabrication platform to accelerate India's semiconductor education and workforce development goals, and an announcement by Applied Materials Inc, to invest USD 400 million to establish a collaborative engineering centre in India.

Joint task forces on advanced telecommunications:

- With the vision of creating secure and trusted telecommunications, resilient supply chains, and enabling global digital inclusion, they launched two joint task forces on advanced telecommunications, focused on Open RAN and research and development in 5G/6G technologies.
- Public-private cooperation between vendors and operators will be led by India's Bharat 6G Alliance and the U.S. Next G Alliance.
- They di emphasised on the need to put in place a "Trusted Network" and "Trusted Sources" bilateral framework.
- They committed to develop joint and international collaboration on trustworthy and responsible AI, including generative AI, to advance AI education and workforce initiatives, promote commercial opportunities, and mitigate against discrimination and bias.
- India and US have set up a joint Indo-US. Quantum Coordination Mechanism for collaboration among industry, academia, and governments. It will work towards a comprehensive Quantum Information Science and Technology agreement between the two countries.

US-India Science and Technology Endowment fund:

- They welcomed the launch of a USD 2-million grant programme under the US-India Science and Technology Endowment fund for the joint development and commercialization of Artificial Intelligence (AI) and quantum technologies, and encouraged public-private collaborations to develop high performance computing (HPC) facilities in India.
- As part of the collaboration, the US side has pledged to make its best efforts in support of India's Center for Development of Advanced Computing (C-DAC) joining the US Accelerated Data Analytics and Computing (ADAC) Institute.

Joint research collaborations:

- US National Science Foundation (NSF) and the Indian Department of Science and Technology (DST) are jointly funding 35 innovative joint research collaborations in emerging technologies.
- Under a new implementation arrangement between NSF and DST, both sides will fund joint research projects in computer and information science and engineering, cyber physical systems, and secure and trustworthy cyberspace.
- Furthermore, NSF and India's Ministry of Electronics and Information Technology will bring fresh funding for joint projects in applied research areas such as semiconductors, next generation communication, cyber security, sustainability and green technologies and intelligent transportation systems.

Digital Public Infrastructure (DPI):

- The United States and India will explore ways to partner align efforts to advance the development and deployment of robust Digital Public Infrastructure (DPI), including appropriate safeguards to protect privacy, data security and intellectual property.
- India has developed a unique ID Aadhaar, unified payment interface to lower and ease financial transactions, CoWin platform to facilitate vaccination etc as part of DPI.

US-India Global Digital Development Partnership:

- The US and India will explore developing a US-India Global Digital Development Partnership to

bring together technology and resources from both countries to enable development and deployment of DPIs in developing countries, the statement said.

RESOLUTION OF SIX OUTSTANDING WTO DISPUTES BETWEEN US AND INDIA THROUGH MUTUALLY AGREED SOLUTIONS

Why in news?

- Recently, the Union Minister of Commerce and Industry, highlighted the resolution of six outstanding World Trade Organisation (WTO) disputes between US and India through mutually agreed solutions as jointly communicated by the Prime Minister of India and President of the United States of America.

The six trade disputes that will be terminated are as follows:

- Three of them have been filed by India against the USA namely,
  a) Countervailing Measures on Certain Hot-Rolled Carbon Steel Flat Products from India (DS436);
  b) Certain Measures Relating to the Renewable Energy Sector (DS510); and
  c) Certain Measures on Steel and Aluminum Products (DS547).
- While the other three disputes, which have been filed by the USA against India are:
  a) Certain Measures Relating to Solar Cells and Solar Modules (DS456);
  b) Export Related Measures (DS541), and
  c) Additional Duties on Certain Products from the United States (DS585).

Highlights of Mutually Agreed Solution (MAS):

- As a part of the agreement, the US has agreed to grant market access to steel and aluminium products under the exclusion process of Section 232 of the Trade Expansion Act 1962.
- India has agreed to remove the additional duty, i.e., retaliatory tariffs on certain products. However, the prevailing basic import duty on these products applicable to all imports will continue.
- This market access will restore opportunities for Indian steel and aluminium exporters, which were restricted since 14th June 2018 because of the US 232 measure under which additional duties of 25% and 10% were levied on steel and aluminium products respectively.
- As part of the market access, going forward, the US Department of Commerce will clear 70% of steel and 80% of aluminium applications for products originating in India.
- These applications will be made under the exclusion process of Sec. 232 by the importers on behalf of the exporters. It would provide significant impetus to raise India's Steel and Aluminium exports by about 35%.

Background:

- India and the US have actively engaged in discussions during the last two years to terminate these six outstanding disputes at the WTO.
- These disputes have been filed by India and the US over a decade, representing certain key sectors of the economy such as steel, aluminium, renewable energy, solar products, and certain key export-related measures.

MINERALS SECURITY PARTNERSHIP

Why in news?

- India has been inducted into the Mineral Security Partnership (MSP), a US-led collaboration of 14 countries that aims to catalyse public and private investment in critical mineral supply chains globally.

What is MSP?

- The Minerals Security Partnership (MSP) is a global initiative by the US to bolster critical mineral supply chains. It is also known as the critical minerals alliance.
- It was announced by the US and other key partner countries in June 2022 with an aim to ensure that critical minerals are produced, processed and recycled in a way that helps countries secure a stable supply of critical minerals for their economies.
- It also aims to weaken China's grip on supplies of critical minerals worldwide.
- The focus is primarily on the supply chains of critical minerals such as cobalt, nickel, lithium and the 17 'rare earth' minerals.

Critical minerals

- A critical mineral is a mineral resource that is essential to the economy and has high economic vulnerability and high global supply chain risk.
- Critical minerals have a supply chain at risk of disruption. They are used to manufacture advanced technologies, such as mobile phones, tablets, electric vehicles, solar panels, wind turbines, fibre optic cables, and defence and medical applications.
- Many critical minerals, including rare earth minerals and metals such as lithium, gallium, tellurium, and indium, are central to high-tech sectors. Rare earth (RE) comprises 17 elements which are classified as light RE elements (LREE) and heavy RE elements (HREE).
- Individual countries develop their own list of critical minerals depending on the importance of particular minerals in the industrial sector and the strategic assessment of supply risks.
- The major critical minerals are graphite, lithium and cobalt. They are critical for making semiconductors and high-end electronics manufacturing. They are also used in manufacturing fighter jets, drones, and radio sets.

Top producers of critical minerals

- The major producers of critical minerals are China, Congo, Chile, Indonesia, South Africa, and Australia. China has global dominance in terms of processing.

Rare earth minerals

- Rare earth minerals are a set of 17 metallic elements, which includes scandium, yttrium, and the 15 lanthanides (15 metallic chemical elements with atomic numbers 57–71, from lanthanum to lutetium).
- Rare earth minerals are necessary components of a wide range of applications such as cellular telephones, flat-screen monitors and televisions, and electric vehicles.

Countries part of the MSP

- Japan, Australia, Finland, the US, Germany, the UK, Canada, the Republic of Korea, France, Sweden, and the European Union are part of the Minerals Security Partnership,

India's concerns

- Some rare earth elements available in India are: neodymium, lanthanum, cerium, samarium, and praseodymium.
- Some elements classified as heavy RE elements, such as dysprosium, terbium, and europium, are not available in the country in extractable quantities. It relies heavily on China for HREE.
- India has recently witnessed a shift from public and private transport to electric vehicles. This underlines the need to secure the supply of critical minerals.
- India needs a multi-dimensional mineral policy to address the issues posed by the uneven distribution of rare earth elements, the Economic Survey 2022-23 had pointed out.

India-Australia Critical Minerals Investment Partnership:

- India and Australia decided to strengthen their partnership in the field of projects and supply chains for critical minerals under the Australia-India Critical Minerals Investment Partnership.
- In March 2022, Australia allocated $5.8 million to the three-year partnership.
- Under this partnership, India can take resources from Australia to meet the growing demand for critical minerals to help India's space and defence industries and the manufacture of electric vehicles.
-

DOES CHINA-PAK N-DEAL FLOUT GLOBAL RULES?

Why in news?

- Recently, China and Pakistan signed an agreement for a 1,200 MW nuclear power plant in the Chashma nuclear complex in Pakistan.
- The deal, reported to be worth $4.8 billion, comes amid Pakistan facing a dual energy and economic crisis.
- The latest nuclear deal between China and Pakistan has implications not only for the crisis-hit country but also for the global governance of nuclear commerce, with China proceeding with the recent deal without seeking necessary waivers from the Nuclear Suppliers Group (NSG).

What is the latest deal?

- This is the fifth reactor at the Chashma nuclear complex (C-5).
- C-5 will be the biggest reactor at Chashma, where China has already constructed four phases of the complex, with four reactors of around 325 MW each.
- It will use China's Hualong One reactor, which has also been installed in two plants in Karachi.

How many other nuclear plants has China built for Pakistan?

- Pakistan is currently operating six China-built nuclear plants, four smaller reactors at the Chashma

complex and two at the Karachi Nuclear Power Plant (KANUPP).

- Pakistan's oldest reactor, the Canada-built KANUPP-1, is now decommissioned, while KANUPP-2 and KANUPP-3 both use 1,100 MW Chinese Hualong
- One reactors. KANUPP-3, with a $2.7 billion investment, went fully online in 2022.
- An agreement for KANUPP-3 was signed in 2013, the year Chinese President Xi Jinping launched his Belt and Road Initiative (BRI), and became a flagship energy project as part of the China Pakistan Economic Corridor (CPEC) of the BRI.
- The Alternative and Renewable Energy Policy rolled out in 2019 envisages increasing the share of renewables to 30% by 2030.
- Currently, thermal sources account for 61% of the energy mix, while hydropower accounts for 24%, nuclear 12%, and wind and solar only 3%, according to the 2021-22 Economic Survey. On the nuclear side, gross capacity of nuclear plants had increased by 39% annually to 3,530 MW.

What are the broader implications?

- China's civilian nuclear projects with Pakistan have come under scrutiny because the Nuclear Suppliers Group (NSG), which describes itself as a group of nuclear supplier countries "that seeks to contribute to the non-proliferation of nuclear weapons through the implementation of two sets of Guidelines for nuclear exports and nuclear-related exports", explicitly prohibits the transfer of nuclear technology by its members to countries that have not signed the nuclear Non-Proliferation Treaty (NPT).
- China joined the 48-member grouping in 2004, and argued subsequently that the Chashma 3 and Chashma 4 reactors were "grandfathered" under its earlier Chashma deals with Pakistan that pre-dated its joining of the NSG.
- Chinese analysts have now justified the continuing nuclear commerce, despite it's NSG commitments, by pointing to the India-U.S. nuclear deal. There are, however, significant differences.

NSG Waiver:

- For one, India and the U.S. had to seek a waiver from the NSG for their civilian nuclear deal, which was granted in 2008, paving the way for India to enter the tent of global nuclear commerce.
- That was, however, only granted after India undertook a number of commitments such as placing facilities under International Atomic Energy Agency (IAEA) safeguards, separating civilian and military nuclear programmes and a continued moratorium on testing.
- Neither has China sought any such waiver from the NSG nor has Pakistan undertaken similar commitments. China has suggested that the reactors being under IAEA safeguards would suffice.
- While China had explained its C-4 and C-5 deals as being part of an earlier agreement, the KANUPP-2 and KANUPP-3 plants were agreed to in 2013, a decade into its NSG membership.

Concerns:

- Experts fear the latest deals have only further eroded the global rules governing nuclear commerce, and also raised questions about both the continuing relevance and future of the NSG and governance of global nuclear commerce.

ECONOMY

CABINET APPROVES CITY INVESTMENTS TO INNOVATE, INTEGRATE AND SUSTAIN 2.0 (CITIIS 2.0)

Why in news?

- Recently, the Union Cabinet has approved the City Investments to Innovate, Integrate and Sustain 2.0 (CITIIS 2.0).

Details:

- CITIIS 2.0 is a program conceived by the Ministry of Housing and Urban Affairs (MoHUA) in partnership with the French Development Agency (AFD), Kreditanstalt für Wiederaufbau (KfW), the European Union (EU), and National Institute of Urban Affairs (NIUA).
- The program will run for a period of four years, i.e., from 2023 till 2027.
- The program envisages to support competitively selected projects promoting circular economy with focus on integrated waste management at the city level, climate-oriented reform actions at the State level, and institutional strengthening and knowledge dissemination at the National level.
- The funding for CITIIS 2.0 would include a loan of Rs.1760 crore (EUR 200 million) from AFD and KfW (EUR 100 million each) and a technical assistance grant of Rs.106 cr. (EUR 12 million) from the EU.
- CITIIS 2.0 aims to leverage and scale up the learnings and successes of CITIIS 1.0.

CITIIS 1.0:

- CITIIS 1.0 was launched jointly in 2018 by MoHUA, AFD, EU, and NIUA, with a total outlay of ₹933 crore (EUR 106 million).

CITIIS 1.0 consisted of three components:

- Component 1: 12 city-level projects selected through a competitive process.
- Component 2: Capacity-development activities in the State of Odisha.
- Component 3: Promoting integrated urban management at the national level through activities undertaken by NIUA, which was the Program Management Unit (PMU) for CITIIS 1.0

Following the CITIIS 1.0 model, CITIIS 2.0 has three major components:

Component 1:

- Financial and technical support for developing projects focused on building climate resilience, adaptation and mitigation in up to 18 smart cities through selection of competitively selected projects promoting circular economy with focus on integrated waste management.

Component 2:

- All States and UTs will be eligible for support on demand basis. The States will be provided support to
  a) set-up/strengthen their existing State climate centres/ Climate cells/ equivalents
  b) create State and city level Climate Data Observatories
  c) facilitate climate-data driven planning, develop climate action plans and
  d) build capacities of municipal functionaries.
- To achieve these objectives, the PMU at NIUA will coordinate provision of technical assistance and strategic support to State Governments.

Component 3:

- Interventions at all three levels; Centre, State and City to further climate governance in urban India through institutional strengthening, knowledge dissemination, partnerships, building capacity, research and development to support scale up across all States and Cities.

Way Forward:

- CITIIS 2.0 will supplement the climate actions of Government of India through its ongoing National programs (National Mission on Sustainable Habitat, AMRUT 2.0, Swachh Bharat Mission 2.0 and Smart Cities Mission), as well as contributing positively to India's Intended Nationally Determined Contributions (INDCs) and Conference of the Parties (COP26) commitments.

WORLD'S LARGEST GRAIN STORAGE PLAN IN COOPERATIVE SECTOR

Why in news?

- Recently, the Union Cabinet approved the constitution and empowerment of an Inter Ministerial Committee (IMC) for facilitation of the "World's Largest Grain Storage Plan in Cooperative Sector" by convergence of various schemes of the Ministry of Agriculture and Farmers Welfare, Ministry of Consumer Affairs, Food and Public Distribution and Ministry of Food Processing Industries.

Pilot Project:

- The Ministry of Cooperation will implement a pilot project in at least 10 selected Districts of different States/ UTs in the country.
- The Pilot would provide valuable insights into the various regional requirements of the project, the learnings from which will be suitably incorporated for the country-wide implementation of the Plan.

Implementation

- An Inter-Ministerial Committee (IMC) will be constituted under the Chairmanship of Minister of Cooperation, with Minister of Agriculture and Farmers Welfare, Minister of Consumer Affairs, Food and Public Distribution, Minister of Food Processing Industries and Secretaries concerned as members to modify guidelines/ implementation methodologies of the schemes of the respective Ministries as and when need arises, within the approved outlays and prescribed goals, for facilitation of the 'World's Largest Grain Storage Plan in Cooperative Sector' by creation of infrastructure such as godowns, etc. for Agriculture and Allied purposes, at selected 'viable' Primary Agricultural Credit Societies (PACS).
- The Plan would be implemented by utilizing the available outlays provided under the identified schemes of the respective Ministries.

Following schemes have been identified for convergence under the Plan:

Ministry of Agriculture and Farmers Welfare:

- Agriculture Infrastructure Fund (AIF),
- Agricultural Marketing Infrastructure Scheme (AMI),
- Mission for Integrated Development of Horticulture (MIDH),
- Sub Mission on Agricultural Mechanization (SMAM)

Ministry of Food Processing Industries:

- Pradhan Mantri Formalization of Micro Food Processing Enterprises Scheme (PMFME),
- Pradhan Mantri Kisan Sampada Yojana (PMKSY)

Ministry of Consumer Affairs, Food and Public Distribution:

- Allocation of food grains under the National Food Security Act,
- Procurement operations at Minimum Support Price

Benefits of the Plan:

- The plan is multi-pronged – it aims to address not just the shortage of agricultural storage infrastructure in the country by facilitating establishment of godowns at the level of PACS, but would also enable PACS to undertake various other activities, viz:
  - Functioning as Procurement centres for State Agencies/ Food Corporation of India (FCI);
  - Serving as Fair Price Shops (FPS);
  - Setting up custom hiring centers;
  - Setting up common processing units, including assaying, sorting, grading units for agricultural produce, etc.
- Further, creation of decentralized storage capacity at the local level would reduce food grain wastage and strengthening food security of the country.
- By providing various options to the farmers, it would prevent distress sale of crops, thus enabling the farmers to realise better prices for their produce.
- It would hugely reduce the cost incurred in transportation of food grains to procurement centres and again transporting the stocks back from warehouses to FPS.
- Through 'whole-of-Government' approach, the Plan would strengthen PACS by enabling them to diversify their business activities, thus enhancing the incomes of the farmer members as well.

Time-frame and manner of implementation:

- National Level Coordination Committee will be formed within one week of the Cabinet approval.
- Implementation guidelines will be issued within 15 days of the Cabinet approval.
- A portal for the linkage of PACS with Govt. of India and State Governments will be rolled out within 45 days of the Cabinet approval.
- Implementation of proposal will start within 45 days of the Cabinet approval.

NATIONAL TRAINING CENTRE FOR FOOD SAFETY AND STANDARDS AUTHORITY OF INDIA

Why in news?

- Recently, the Union Minister for Health and Family Welfare, inaugurated the state-of-the-art National Training Centre for Food Safety and Standards Authority of India (FSSAI) at Ghaziabad, Uttar Pradesh yesterday.

Key Highlights:

- The National Training Centre of the Food Safety and Standards Authority of India (FSSAI) at Ghaziabad, Uttar Pradesh is an essential initiative aimed at providing structured instruction, practice, and learning experiences to bridge the gap between existing knowledge or skills and desired knowledge or skills in the field of food safety and standards.

- As mandated by the Food Safety and Standards (FSS) Act 2006 and the Food Safety and Standards Rules, 2011, FSSAI is responsible for providing training to individuals involved in food businesses, including food business operators, employees, Food Safety Officers, and designated officers.
- Recognizing the importance of continuous skill upgrading for officials, food business operators, and other stakeholders, FSSAI has established the National Training Centre to offer various training programs.
- This dedicated center fills the void that previously existed, ensuring the development of a future-ready workforce committed to ensuring safe and wholesome food for the citizens of India.

Other releases:

- On this occasion, an e- learning app- Food Safety and Certification (FoSTaC) developed by FSSAI that contains learning and training modules about food safety guidelines, such as proper food handling, storage, and hygiene practices etc., for street vendors was also launched.
- He also released two books developed by FSSAI - Millets (Shree Anna) Recipes- A Healthy Menu for Mess/Canteens and Healthy Gut, Healthy You - Traditional recipes with potential probiotic benefits.

OIL RESERVES IN SALT CAVERNS, THE POTENTIAL IN INDIA

Why in news?

- Engineers India (EIL) is studying the prospects and feasibility of developing salt cavern-based strategic oil reserves in Rajasthan, in line with the government's objective of increasing the country's strategic oil storage capacity.
- If the idea comes to fruition, India could get its first salt cavern-based oil storage facility.

Why strategic crude oil reserves?

- India's three existing strategic oil storage facilities, at Mangaluru and Padur in Karnataka, and Visakhapatnam in Andhra Pradesh are made up of excavated rock caverns.
- Countries build strategic crude oil reserves to mitigate major supply disruptions in the global supply chain. India, the world's third-largest consumer of crude, depends on imports for more than 85% of its requirement and strategic petroleum reserves (SPR) could help ensure energy security and availability during global supply shocks and other emergencies.
- India currently has an SPR capacity of 5.33 million tonnes, or around 39 million barrels of crude, that can meet around 9.5 days of demand. India is in the process of expanding its SPR capacity by a cumulative 6.5 million tonnes at two locations; Chandikhol in Odisha (4 million tonnes) and Padur (2.5 million tonnes).
- India's strategic oil reserves come under the Petroleum Ministry's special purpose vehicle Indian Strategic Petroleum Reserve (ISPRL). EIL was instrumental in setting up the country's existing SPR as the project management consultant.
- Salt cavern-based storage, which is considered cheaper and less labour- and cost-intensive than rock caverns, could add a new, much needed chapter to India's SPR story.

Salt cavern-based reserves v. rock cavern-based reserves

- Unlike underground rock caverns, which are developed through excavation, salt caverns are developed by the process of solution mining, which involves pumping water into geological formations with large salt deposits to dissolve the salt.
- After the brine (water with dissolved salt) is pumped out of the formation, the space can be used to store crude oil. The process is simpler, faster, and less cost-intensive than developing excavated rock caverns.
- Salt cavern-based oil storage facilities are also naturally well-sealed, and engineered for rapid injection and extraction of oil. This makes them a more attractive option than storing oil in other geological formations.
- The salt that lines the inside of these caverns has extremely low oil absorbency, which creates a natural impermeable barrier against liquid and gaseous hydrocarbons, making the caverns apt for storage. Also, unlike rock caverns, salt cavern-based storages can be created and operated almost entirely from the surface.
- Salt caverns are also used to store liquid fuels and natural gas in various parts of the world. They are also considered suitable for storing compressed air and hydrogen.

US Strategic Petroleum Reserve:

- The entire SPR programme of the United States has so far been based on salt cavern-based storage facilities.
- The US Strategic Petroleum Reserve, the world's largest emergency oil storage, consists of four sites with deep underground storage caverns created in salt domes along the Gulf of Mexico coast in Texas and Louisiana. The US strategic oil reserves have a cumulative capacity of around 727 million barrels.

Potential in India for storing crude, petroleum products

- Rajasthan, which has the bulk of requisite salt formations in India, is seen as the most conducive for developing salt cavern-based strategic storage facilities.
- Plans over the past decade to build a strategic oil reserve in Bikaner did not take off and the exploration of the possibility of salt cavern-based strategic storage in Rajasthan can be seen as a renewal of that proposal.
- A refinery is coming up in Barmer, and Rajasthan has crude pipelines as well; such infrastructure is conducive for building strategic oil reserves. However, no Indian company, including EIL, had the requisite technical know-how to build salt cavern-based strategic hydrocarbon storage.
- This gap in access to technology has been bridged by EIL's recent partnership with Germany's DEEP.KBB GmbH, a company that specialises in cavern storage and solution mining technology.

Strategic petroleum reserves programme:

- India's strategic oil reserves are part of the effort to build sufficient emergency stockpiles on the lines of the reserves that the US and its Western allies set up after the first oil crisis of the 1970s. The three existing rock cavern-based facilities were built during the first phase of the programme.
- Crude oil from the reserves are to be released by an empowered committee set up by the government, in the event of supply disruptions due to a natural calamity or an unforeseen global event leading to an abnormal increase in prices.
- The International Energy Agency (IEA), a Paris-based autonomous intergovernmental organisation in

which India is an 'Association' country, recommends that all countries should hold an emergency oil stockpile sufficient to provide 90 days of import protection.

- In India, apart from the SPR that are sufficient to meet 9.5 days of oil requirement, the oil marketing companies (OMCs) have storage facilities for crude oil and petroleum products for 64.5 days — which means there is sufficient storage to meet around 74 days of the country's petroleum demand.

Commercialization:

- India has also decided to commercialise its strategic petroleum reserves, as part of which the Abu Dhabi National Oil Company (ADNOC) stored about 0.8 million tonnes of crude oil in the Mangaluru strategic reserve.
- In the second phase of the programme, the government wants to develop strategic reserves through public-private partnerships so as to reduce government spending and exploit the commercial potential of the reserves.
- Taking advantage of low crude oil prices in April-May 2020, the government completely filled these reserves, leading to estimated savings of around Rs 5,000 crore.
- In late 2021, India released 5 million barrels from its strategic reserves as part of a coordinated US-led action by major oil consuming countries against the joint decision of major oil producing nations to curb output.

WHAT IS AFFECTING TRADE MOMENTUM?

Why in news?

- Mired in a slowing economy, inflationary setting and tighter monetary controls worldover, India's merchandise exports shrunk 12.7% on a year-on-year (YoY) basis to $34.66 billion in April, a six-month low. Imports fell sharper by 14% to $49.90 billion during the same period.
- The fall in imports and exports is not limited to India as other countries too have recorded similar declines, affirming the notion about slowing global demand.

What are the current underlying trends in global trade?

- The essential headwinds observed with respect to global trade are weaker economic activities worldwide, inflation and tightening of monetary policies, disrupted supply chains because of the Russia-Ukraine conflict and financial instability because of the collapse of several financial institutions in advanced economies.
- The ongoing conflict in Eastern Europe continues to have a bearing on the prices of energy, food and commodities. The impact of energy prices was strongest during the winter months in Europe as Russia was among the largest suppliers of energy to Europe before it was sanctioned.
- Europe responded to the loss of gas shipments from Russia by shifting to other suppliers, including the U.S., Qatar, Norway and Algeria. This potentially increased LNG prices elsewhere such as Japan, where the prices doubled between January 2022 to February 2023.
- The collapse of financial institutions such as of the crypto exchange FTX (November 2022) alongside three banks in the U.S. since March (the Silicon Valley Bank, Signature Bank and First Republic Bank), and the loss of confidence in Credit Suisse added to the troubled scenario.

Inflation scenario:

- The EU is India's third largest trading partner after the U.S. and China. The European Economic Forecast held that the region would "narrowly escape the recession" that took shape around September.
- As for the U.S., inflation had "somewhat" moderated since the middle of the last year. Nonetheless, inflation pressures continued to run high with expectations of it receding to 2% having a "long way to go".
- The JP Morgan Global Manufacturing Purchasing Managers' Index (PMI), compiled by S&P, registered 49.6 in May, unchanged for the third consecutive month and indicating a marginal deterioration of business conditions. The indicator is used to assess manufacturing business conditions.

How are these related to trade?

- In a period of economic slowdown, international trade, both exports and imports, falls sharply as overall demand for goods and services stand reduced. There is an aversion for discretionary spending which particularly weighs on some imports and postponable expenditures.
- It is in this light that the exports of engineering goods, gems and jewellery, chemicals, and readymade garments and plastics, along with petroleum products contracted or grew at a slower pace in 2023.
- Similarly, inflation, the uneven rise in prices especially of essentials such as food and energy erodes the purchasing power of an individual.

- Additionally, inflation also affects the flow of capital to a developing country. Important to note, the share of exports of goods and services combined in GDP stood at 21.4% in FY 2021-22.

WHY IS CRS, THE BODY INVESTIGATING THE ODISHA RAIL ACCIDENT, UNDER THE AVIATION MINISTRY

Why in news?

- Investigation into the recent tragic train accident in Odisha is being conducted by the Commissioner of Railway Safety for the south-eastern circle.
- Rail safety commissioners are part of the Commission of Railway Safety (CRS), a government body that acts as the railway safety authority in the country.

Role of CRS:

- CRS deals with matters related to safety of rail travel and operations, among some other statutory functions; inspectorial, investigatory, and advisory as laid down in the Railways Act, 1989.
- Investigating serious train accidents is one of the key responsibilities of the CRS, which is headquartered in Lucknow, Uttar Pradesh.
- The CRS does not report to the Ministry of Railways of the Railway Board. It is, in fact, under the administrative control of the Ministry of Civil Aviation (MoCA).
- The reason or principle behind this is to keep the CRS insulated from the influence of the country's railway establishment and prevent conflicts of interest. One needs to go back in time to understand the evolution of the CRS and its unique relationship with MoCA.

Evolution of safety oversight in railways in India:

- The first railways in India came into being in the 1800s and were constructed and operated by private companies. At the time, the British Indian government appointed 'consulting engineers' for effective control and oversight of the developing railway network and operations.
- Later, when the British Indian government undertook construction of railways in the country, the consulting engineers were re-designated as 'government inspectors', and in 1883, their position was recognised statutorily. In the first decade of the twentieth century, the Railway Inspectorate was placed under the Railway Board, which was established in 1905.
- As per the Indian Railway Board Act, 1905, and a notification by the then Department of Commerce and Industry, the Railway Board was entrusted with powers and functions of the government under various sections of the Railway Act and was also authorised to make rules for railway operations in India. This effectively made the Railway Board the safety controlling authority for railways in India.

Separation of safety supervision function and Railway Board:

- The Government of India Act, 1935 said that functions for securing the safety of railway operations, both for the travelling public and personnel operating the railways, should be performed by an authority independent of the federal railway authority or the Railway Board.
- These functions included conducting railway accident probes. But due to the outbreak of the Second World War in 1939, the idea did not take off and the Railway Inspectorate continued to function under the control of the Railway Board.
- In 1939, a panel headed by the then chief inspecting officer of the British Railways, A.H.L. Mount, said that the separation of the Railway Inspectorate from the Railway Board was "very desirable" as it will do away with the anomaly of the Railway Board being the "inspecting as well as the executive authority" for railway operations in India.

Transfer of Railway Inspectorate from Railway Board's control:

- In 1940, the Central Legislature endorsed the idea and principle of separation of the Railway Inspectorate from the Railway Board, and recommended that the senior government inspectors of the railways should be placed under the administrative control of a different authority under the government.
- Consequently, in May 1941, the Railway Inspectorate was separated from the Railway Board and put under the administrative control of the then Department of Posts and Air.
- Since then, the Inspectorate, which was re-designated as the CRS in 1961, has been under the control of the central ministry exercising control over civil aviation in India.

INDIA HAS EMERGED AS THE 2ND LARGEST PRODUCER OF CRUDE STEEL IN THE WORLD

Why in news?

- Recently, the Union Minister of Steel and Civil Aviation, held a press conference on the theme 9-years of Government's "Seva, Sushasan and Gareeb kalyan" focusing on the Steel sector.

India achievements:

- India currently ranks as the World's 2nd Largest Producer of Crude Steel, surpassing Japan in 2018.
- India stands as a net exporter of steel witnessing an export of 6.72 MT of finished steel against the import of 6.02 MT in 2022-23. The country was a net importer of steel in 2014-15 with 9.32 MT imports Vis-à-vis the export of 5.59 MT.
- In the past 9 years (2014-15 to 2022-23), Steel CPSEs viz. SAIL, NMDC, MOIL, KIOCL, MSTC, and MECON, used ₹90,273.88 crores of their own resources for CAPEX and paid a dividend to the Government of India to the tune of ₹21,204.18 crores

Steel Scrap Recycling Policy:

- Six Vehicle Scrapping Centres have been opened in various cities, with three more planning to begin their operations soon.
- The End-of-life vehicles (ELVs), will be used as raw material for the production of steel and in this regard state governments as well as private sector are being on-boarded.

National Steel Policy 2017 (NSP 2017):

- With a focus on developing a "technologically advanced and globally competitive steel industry that promotes economic growth", he highlighted the targets set by NSP 2017, which will take the steel sector to new heights.
- India has set the targets of achieving the total crude steel capacity of 300 MTPA and total crude steel demand/production of 255 MTPA by 2030-31. By 2030-31, it is also envisaged to enhance the operational capacity of crude steel production of SAIL from existing 19.51 MTPA to around 35.65 MTPA tentatively.

Productivity Linked Incentive Scheme (PLI):

- So far 57 MoUs involving 27 companies have been signed under the PLI Scheme for domestic production of specialty steel. This will attract a committed investment of around ₹30,000 crore with a downstream capacity addition of 24.7 million tonne and an employment generation potential of 55000.
- 'Brand India' labeling is an important exercise to differentiate Indian quality steel from the others. The Ministry of Steel has undertaken the initiative of Made in India branding of Steel produced in the country and major Steel Producers have already come together in this direction.
- The Ministry of Steel has also on-boarded itself on the PM Gati Shakti National Master Plan Portal and identified 22 critical infrastructure gaps and is pursuing it with the Ministry of Road Transport and Highways, Ministry of Railways, Ministry of Ports, Shipping and Waterways.
- In order to promote Decarbonization in steel sector, the Ministry has already constituted 13 task forces for identifying the action points for each aspect of green steel production and is in continuous talks with stakeholders from the steel industry and other Ministries/ Departments such as Ministry of Environment, Forests & Climate Change (MOEFCC), Railways, Power, etc.

SAGAR SAMRIDDHI

Why in news?

- Recently, the Union Minister of Ports, Shipping & Waterways (MoPSW) launched 'SAGAR SAMRIDDHI', the online dredging monitoring system in order to accelerate 'Waste to Wealth' initiative of the Ministry.

Details:

- This system has been developed by National Technology Centre for Ports, Waterways and Coasts (NTCPWC) the technological arm of MoPSW.
- The new technology brings in marked improvement against the old system of Draft & Loading Monitor (DLM) system.

Highlights:

- The system will bring in synergy among multiple input reports like daily dredging report, the pre and post dredging survey data before processing and producing real time dredging report.
- The 'Sagar Samriddhi' monitoring system will also allow Daily and monthly progress Visualisation, Dredger performance and downtime monitoring, easy location track data with snapshot of loading, unloading and idle time.
- This system strengthens the Atmanirbhar Bharat and Make in India vision of PM Modi.

Capabilities of 'Sagar Samriddhi' include:

a) Real time dredging progress report
b) Daily and monthly progress Visualisation
c) Dredger performance and downtime monitoring
d) Easy location track data with snapshot of loading, unloading and idle time

Addendum to the Dredging Guidelines 2021:

- In March 2023 Ministry issued Addendum to the Dredging Guidelines 2021 for Major Ports for disposal of dredged material by incorporating a necessary provision in bidding documents which will help in reducing the dredging cost in form of 'Waste to Wealth'.
- The annual maintenance dredging at Major Ports and Waterways is around 100 million cubic meters, for which about Rs.1000 crores are spent each year by the Ports and IWAI.
- Now with implementation of the Addendum of the Dredging guidelines and by using the Sagar Samriddhi, online dredging monitoring system, the dredging cost will be greatly reduced along with bringing in more transparency and efficiency in the overall system.
- Presently Cochin Port and Mumbai Port, have adopted the system and on New Mangalore Port and Deendayal Port it is running on trial basis.
- Now, MoPSW has mandated all Major Ports and lWAl to monitor the dredging activity through this system with customisation from NTCPWC. Accordingly, new dredgers will be using this system along with the old dredgers, which will be upgraded and equipped with the new system.

About NTCPWC:

- The NTCPWC was established under the Sagarmala Programme of MoPSW with the total investment of ₹ 77 Crores at IIT Madras which was inaugurated by the Minister on 24th April 2023.
- The aim of the centre is to enable research & development for the marine sector, enabling solutions towards achieving the ultimate goal of building a robust marine industry in the country.
- This state-of-the-art centre has world class capabilities for undertaking the 2D & 3D investigations of research and consultancy nature for the Port, Coastal, and Waterways sector across all disciplines.

INDIA LOOKS AT DEVISING OWN STANDARDS TO ASSESS SOCIO-ECONOMIC PROGRESS

Why in news?

- India is now actively discussing redrawing parameters to cater to, and accommodate its, national diversity and local anthropometric measurements and has said the use of childhood stunting numbers, female labour force participation rate and life expectancy at birth allegedly leads to anomalies.
- The Union Health Ministry in March 2023 developed and released its own mechanism for estimating the tuberculosis burden in the country.

Issues with methodology of WHO:

- Previously, the Ministry questioned the World Health Organization's mathematical modelling used to estimate COVID-19 deaths, calling it "unscientific". More recently, India has dropped questions on anaemia and disability from the National Family Health Survey-6 (NFHS), which is set to begin next month.
- The three widely used data-driven development indicators — childhood stunting (India's NFHS estimates based on WHO growth standards), female labour force participation rate by the International Labour Organization and life expectancy at birth by the United Nations — suggest that global standards often present a misleading picture of important socio-economic development indicators.
- Improper adjustments using modelling procedures end up skewing data for India. Also worrying is the fact that there is a growing use of environmental, social and governance (ESG) norms in investment and trade decisions which it said increases the need for accurate data in these areas.
- The problem is well known in the medical field and taking cognisance of the diversity of children's growth (in this case stunting), Indonesia, the U.K., and the U.S. have developed their own growth charts for reference by medical practitioners.
- For calculating life expectancy at birth for India, the estimates were sharply cut by the United Nations Population Division from 70.19 in 2019 to 67.24 in 2021.

Universal applicability of WHO 2006 growth standards:

- The WHO 2006 growth standards have provided a valuable framework for comparing the growth of children under five across various races and ethnicities, enabling objective and straightforward assessments, particularly when making cross-country comparisons.
- However, a growing concern has emerged regarding the universal applicability of these standards, leading some countries, including the United States, to adopt their country-specific growth benchmarks.

- In developing nations, utilising the WHO 2006 standards has resulted in overestimating stunting and wasting cases.
- In India, the current practice of using WHO standards would translate to about 10 million and 12 million more children being classified as stunted and wasted, respectively, as opposed to a country and region-specific standard available for the Indian urban middle class.
- Similarly, a significant shift in reported wasting prevalence occurred when transitioning from the previously dominant National Center for Health Statistics (NCHS) growth references to the WHO standard.
- Pooled data from 21 developing countries demonstrated that the prevalence of severe wasting in infants under six months increased by 3.5 times, while severe child wasting was 1.7 times higher when applying the WHO standard as the new case definition.

Way Forward:

- India should engage in an informed and transparent discussion to assess whether sole reliance on the WHO Growth Standards-based prevalence is appropriate or whether an India-specific reference should be considered.
- This becomes particularly important when setting national targets for addressing stunting and wasting in the country.

HOW GOVT DRONE SURVEY IS CLEARING UP LAND OWNERSHIP IN VILLAGES ACROSS INDIA

Why in news?

- The State governments have issued as many as 1.32 crore property cards in 2.55 lakh villages across the country as of June 2023, giving people ownership documents for their property under SVAMITVA Yojana.

SVAMITVA Yojana:

- The central government's Survey of Villages and Mapping with Improvised Technology in Village Areas (SVAMITVA) Yojana, which creates a Record-of-Rights (RoR) for inhabited areas (as opposed to agricultural land) in villages.
- The scheme was launched in April 2021 after a pilot project was carried out in nine states: Haryana, Karnataka, Madhya Pradesh, Maharashtra, Uttar Pradesh, Uttarakhand, Punjab, Rajasthan, and Andhra Pradesh.
- The Survey of India is preparing maps using drones and information provided by state governments about property owners after on-field verification.
- The SVAMITVA scheme is also meant to address land-related disputes, help villagers take bank loans against their properties and aid gram panchayats in preparing development plans and collecting property tax.
- The yojana is being implemented in 3.72 lakh notified villages out of 6.62 lakh villages in 31 states and Union Territories (UTs).
- West Bengal, Bihar, Meghalaya and Nagaland didn't participate in the scheme, nor did Chandigarh, which doesn't have any villages.

Implementation:

- The Ministry of Panchayati Raj, which is implementing the scheme together with state governments, has already mapped 69 percent of the notified villages, and plans to complete the drone surveys by March 2023.
- The drone survey is complete in nine states and UTs and work is on to finalise the maps. These are: Uttarakhand, Madhya Pradesh, Goa, Haryana, Delhi, Puducherry, Lakshadweep, the Andaman and Nicobar Islands, and Dadra & Nagar Haveli and Daman & Diu.
- Uttar Pradesh has issued the highest number of property cards (57.26 lakh in 39,823 villages) followed by Haryana (25.90 lakh in 6,260 villages), and Madhya Pradesh (20.89 lakh in 16,797 villages).
- In several other states including Karnataka, Kerala, Mizoram, Manipur and Tripura less than 25 percent of the villages have been surveyed using drones.

How it helps people, government?

- In the case of agricultural land, state authorities record ownership in the RoR, which provides good evidence and can be relied on by banks while disbursing loans.
- But most states don't have a record of rights for the abadi (inhabited) area. This missing data has resulted in several land disputes over the years, especially as populations grew.
- The data is also being used by some gram panchayats to collect property tax, resulting in an increase in their income.
- The data is also being used to plan infrastructure development.

Use of drones & new eco-system:

- The Survey of India is using drones and the Continuously Operating Reference Station (CORS) technology to capture images and prepare maps.

- Drones are used to capture images based on details provided by the state government and marking done on the ground.
- The draft map is shared with the state to verify property-wise details on the ground. The map is then updated, and the state governments use its final version to issue property cards.

WILL A HIKE IN MSP HELP FARMERS?

Why in news?

- Recently, the Centre announced the Minimum Support Price (MSP) for 2023 summer (kharif) season crops, hiking prices between 5-10% from last season, "to ensure remunerative prices to growers for their produce and to encourage crop diversification."
- Experts argue that in the absence of any dependable or assured market mechanism of procurement-purchase for crops on the MSP in most parts of the country, the purpose of encouraging "crop diversification" gets defeated.

How does the MSP work?

- The MSP, which is a part of the government's agricultural price policy, is the price at which the government offers to procure farmers' produce during the season.
- It works as a tool to stabilise production and to control consumer prices, yet farmers across the country have been facing problems of selling their produce at the MSP.
- Delays in establishing procurement centres, exploitation at the hands of commission agents, who most of the time buy the produce from farmers below the MSP, and a lack of awareness about the MSP among a large section of farmers, are some of the challenges growers have been facing for years now.
- Against this background, farmers have been demanding a 'legal status' to the MSP. The government, including the Centre and States, ought to come up with a system to set up an 'assured market mechanism,' point out farmers. The MSP has little meaning unless farmers' produce is procured/ purchased at the assured price.

What is the government's announcement?

- The government announced the MSP for 17 'kharif' crops, like paddy, pulses (moong, arhar, urad), oilseeds like groundnut and soyabean and cotton, for the marketing season of 2023-24. These were approved at a meeting of the Cabinet Committee on Economic Affairs (CCEA).
- The increase in MSP is in line with the Union Budget 2018-19 announcement of fixing the MSP at a level of at least 1.5 times the all-India weighted average cost of production, which aims at a reasonably fair remuneration for the farmers.

Concerns of farmers:

- Several farmers' outfits have expressed their discontentment over the latest MSP for the summer crops, terming it as insufficient. According to the All India Kisan Sabha, the declared MSP is "unfair, belies the hopes of the farmers and inflicts huge losses in their incomes."
- Rising input costs coupled with unfair MSP will push large sections of farmers, especially the small, marginal, and middle-level farmers, as well as tenants into indebtedness.
- The longstanding promise made by the Bharatiya Janata Party in 2014 that the MSP will be given according to the Swaminathan Commission recommendation of C2+50% (C2 or comprehensive cost of production) remains an unfulfilled election promise.
- Also, the government needs to make MSP a statutory right of the farmers. Farmers need to have an assurance that their crops will be purchased at the MSP to survive in the otherwise economically-unsustainable agricultural sector.

What are agriculture experts saying?

- The past track record shows that only three to four crops (mainly wheat, paddy and cotton and at times some pulses), were being procured at MSP while the remaining crops were being procured at much below the MSP.
- This is mainly because the farmers are left at the mercy of market forces and the private players. Non-implementation of MSP and below-MSP-procurement of a large number of crops, inter alia, has been one of the major hurdles in 'crop diversification' which is so vital for Indian agriculture and in saving the environment. Ineffective implementation of MSP and 'non-procurement' of all the crops at the MSP is also one of the main concerns of farmers.
- Such a scenario builds a strong rationale for giving 'legal status' to MSP as it is the floor or reference price. This does not imply that the government should procure all those crops but would certainly bind the private players to procure those crops at least at the MSP.

- While facilitating crop-diversification it would raise farmers' income which is being propagated by the government.

What about foodgrain stock?

- As per third advance estimates for 2022-23, total foodgrain production in the country is estimated at a record 330.5 million tonnes which is higher by 14.9 million tonnes compared to 2021-22. This is the highest increase in the last five years, according to government data.
- The total stocks of rice and wheat held by Food Corporation of India (FCI) and State agencies as on May 1, 2023, was 555.34 lakh tonnes comprising 265.06 lakh tonnes of rice and 290.28 lakh tonnes of wheat.

What lies ahead?

- The MSP attempts to strike a balance between the interest of growers and consumers. The government's price support policy attempts to provide a fair return to farmers while keeping in view the interest of consumers in a way that prices of food and other agricultural commodities are kept at a reasonable level. A rise in their income could be the long-term answer to farmers' financial distress.
- To ensure this rise in income, the government should focus on setting up an effective system to provide assured purchase and returns to farmers for all major crops at the MSP, as is done in the case of wheat and rice or extend subsidies on input costs.

PLI SCHEMES CONTRIBUTE TO INCREASE IN PRODUCTION, EMPLOYMENT GENERATION, AND ECONOMIC GROWTH

Why in news?

- The Production Linked Incentive (PLI) Schemes have led to a significant increase in production, employment generation, economic growth and exports in the country.

PLI schemes:

- The PLI schemes as envisioned by the Prime Minister, with the objective of making India 'AatmaNirbhar' is built on the foundation of 14 sectors with an incentive outlay of Rs. 1.97 lakh crore (about US$ 26 billion) to strengthen their production capabilities and help create global champions.

Key achievements:

- Due to PLI Schemes, there was a significant increase of 76% in FDI in the Manufacturing sector in FY 2021-22 (USD 21.34 billion) compared to previous FY 2020-21 (USD 12.09 billion).
- Sectors for which PLI schemes exist and have seen an increase in FDI inflows from FY 2021-22 to FY 2022-23 are Drugs and Pharmaceuticals (+46%), Food Processing Industries (+26%) and Medical Appliances (+91%).
- PLI Schemes have transformed India's exports basket from traditional commodities to high value- added products such as electronics & telecommunication goods, processed food products etc.
- PLI Scheme has led to major smartphone companies shifting its suppliers to India, e.g., Foxconn, Wistron and Pegatron. As a result, top high-end phones are being manufactured in India.
- It has also resulted in a 20-fold increase in women employment and localization in IT Hardware such as Battery & Laptops.
- The value addition in mobile manufacturing in India is to the tune of 20%. India have been able to increase the value addition in mobile manufacturing to 20% within a period of 3 years whereas countries like Vietnam achieved 18% value addition over 15 years and China achieved 49% value addition in over 25 years. Seen in this perspective, it is a big achievement.

LSEM:

- PLI Scheme for Large-Scale Electronics Manufacturing (LSEM), along with existing Phased Manufacturing Program (PMP) has led to increased value addition in the electronics sector and in smartphone manufacturing, 23% and 20% respectively, from negligible in 2014-15.
- Of the USD 101 Billion total electronics production in FY 2022-23, smartphones constitute USD 44 Billion including USD 11.1 Billion as exports.

Telecom sector:

- Import substitution of 60% has been achieved in the Telecom sector and India has become almost self–reliant in Antennae, GPON (Gigabit Passive Optical Network) & CPE (Customer Premises Equipment). Drones sector has seen a 7 times jump in turnover due to the PLI Scheme which consists of all MSME Startups.

Food Processing:

- Under the PLI Scheme for Food Processing, sourcing of raw materials from India has seen significant increase which has positively impacted income of Indian farmers and MSMEs.

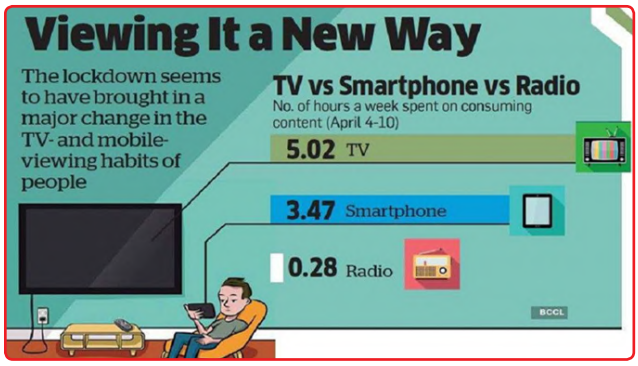
Pharma Sector:

- Due to the PLI Scheme, there has been a significant

reduction in imports of raw materials in the Pharma sector.

- Unique intermediate materials and bulk drugs are being manufactured in India including Penicillin-G, and transfer of technology has happened in manufacturing of Medical Devices such as (CT scan, MRI etc.).

NEWS CONSUMPTION FALLS IN INDIA, SAYS STUDY



Why in news?

- Recently, the Reuters Institute Digital News Report, 2023 was released.
- The 12th edition of the report, produced in collaboration with the Asian College of Journalism, surveys the news consumption habits of consumers across 46 markets.

Key Highlights:

- Finland remained the country with the highest levels of overall trust in news (69%), while Greece had the lowest levels (19%), globally.
- Overall consumption and sharing of news declined in India from last year's figures, along with a sharp decrease in access to online news (-12 percentage points), while television, too, saw a 10 percentage points decline as a news source.
- India registered a small decrease of 3 percentage points in overall trust in news (38%) from last year's figure, and was ranked 24th among 46 countries in this regard.

Preferred broadcasters in India:

- Among individual news brands, public broadcasters like DD India, All India Radio, and BBC News retained high levels of trust among survey respondents in India, emphasising the importance of public service media.
- YouTube was the most preferred social media platform for news with 56% of the respondents accessing it. WhatsApp (47%) and Facebook (39%) were the next two preferred social media platforms for news in India among the survey respondents.
- Dainik Bhaskar, a Hindi daily, featured among the top 10 brands accessed both online and offline by the survey respondents.

Global focus on news from social media:

- Globally, the report found that video-based content, distributed via networks such as TikTok, Instagram and YouTube, is becoming more important for news, especially in parts of the Global South, while legacy platforms such as Facebook are losing influence.
- Barely 28% of respondents said they accessed news via Facebook in 2023, as against 42% in 2016. Part of the reason for this was Facebook pulling back from news at the same time that YouTube and TikTok began to attract larger chunks of young audiences.
- On the other hand, news usage for the other social media giant, Twitter, remained relatively stable following Elon Musk's takeover, with the usage of alternative networks such as Mastodon extremely low.
- The fastest-growing social network used by the survey respondents for any purpose was TikTok (used by 44% of the 18-24 age group), with 20% of them using it for news. The app was most heavily used in parts of Asia, Latin America and Africa.

Concerns:

- The users of TikTok, Instagram and Snapchat paid more attention to celebrities and social media influencers than they did to journalists and media companies when it came to news topics. This was in sharp contrast to legacy social networks such as Facebook and Twitter, where news organisations still attracted the most attention.
- The stated preferences by audiences to directly visit news websites continue to decline. Globally, the proportion that say their main access point is via a news website or app has fallen from 32% in 2018 to 22% in 2023", while dependence on social media access for news has grown from 23% to 30%.
- The news podcasting continued to resonate with educated and younger audiences though it remained a minority activity overall. About 34% of the respondents accessed a podcast monthly, while 12% accessed a show on news and current affairs.

News avoidance:

- The report also flagged a continuing trend of news avoidance (partly for mental health-related reasons) in a large number of countries. Among news avoiders, around half (53%) tried to avoid all news periodically, while 32% tended to avoid "difficult topics".

INDIA'S SEAFOOD EXPORTS TOUCH AN ALL-TIME HIGH IN FY 2022-23

Why in news?

- India achieved an all-time high exports of seafood both in terms of volume and value (both US$ and Rupee) by shipping 17,35,286 MT of seafood worth Rs. 63,969.14 crore (US$ 8.09 billion) during FY 2022-23 despite the several challenges in its major export markets like USA.

Details:

- During the FY 2022-23, the export improved in quantity terms by 26.73%, in rupee terms by 11.08%, in US$ terms by 4.31%.
- In 2021-22, India had exported 13,69,264 MT of seafood worth Rs 57,586.48 crore (US$ 7,759.58 million).

Shrimp exports:

- Frozen shrimp remained the major export item in terms of both quantity and value while USA and China turned out to be the major importers of India's seafood.
- Frozen shrimp, which earned Rs 43,135.58 crore (US$ 5481.63 million), retained its position as the most significant item in the basket of seafood exports, accounting for a share of 40.98% in quantity and 67.72% of the total US$ earnings. Shrimp exports during the period increased by 1.01 % in Rupee value.
- The overall export of frozen shrimps during 2022-23 was pegged at 7,11,099 MT.
- USA, the largest market, imported (2,75,662 MT) of frozen shrimp, followed by China (1,45,743 MT), European Union (95,377 MT), South East Asia (65,466 MT), Japan (40,975 MT), and the Middle East (31,647 MT).
- The export of black tiger (BT) shrimp increased by 74.06%, 68.64% and 55.41% in quantity, Rupee value and US$ terms respectively in 2022-23. BT shrimp exported to the tune of 31,213 MT worth Rs 2,564.71 Cr (US$ 321.23 million).
- Japan turned out to be the major market for Black Tiger shrimp with a share of 25.38% in terms of US$ value, followed by the European Union (25.12%) and USA (14.90%).
- The Vannamei shrimp exports declined in 2022-23 compared to 2021-22 by 8.11% from US$ 5234.36 million to US$ 4809.99 million.

Other items:

- Frozen Fish, the second largest exported item, fetched Rs. 5,503.18 Cr. (US$ 687.05 million) accounting for 21.24% in quantity and 8.49% in US$ earnings. This year the export of Frozen fish has increased by 62.65%, 58.51% and 45.73% in Quantity, Rupee and US$ value terms respectively.
- Under Other items, the third largest export basket worth US$ 658.84 million, Surimi fetched Rs. 2,013.66 crore (US$ 253.89 million), frozen Octopus fetched Rs. 725.71 crore (US$ 91.74 million), Surimi Analogue products fetched Rs. 558.51 crore (US$ 70.35 million), canned products fetched Rs. 326.48 crore (US$ 41.56 million), frozen lobster fetched Rs. 215.15 crore (US$ 27 million), along with other products.
- Frozen Squid, the fourth largest export item, fetched Rs 3593.75 crore (US$ 454.61 million), accounting for 4.83 per cent share in quantity and 5.62 per cent in US$ earnings. The export of frozen fish increased by 28.07% in Rupee value and 18.58 % in US$ value.
- Export of Dried Items, pegged at 2,52,918 MT, showed a tremendous growth of 243.27% in quantity and 167.70 % in US$ terms, and earned Rs 3,080.92 crore (384.05 US$ millions). Under this basket, Dried fish and shrimp meal together contributed US$ 307.96 million and dried fish maws fetched US$ 24.88 million.
- Export of frozen Cuttlefish, pegged at 54,919 MT, showed a growth of 14.09 % in rupee value and 5.50 % in US$ value, and earned Rs 2353.34 crore (295.49 US$ millions).

Export destinations:

- As for overseas markets, USA continued to be the major importer of Indian seafood in value terms with an import worth US$ 2,632.08 million, accounting for a share of 32.52 % in terms of US$ value. Exports to the US declined by 21.94% in US$ terms due to sluggish demand.
- Frozen shrimp continued to be the principal item exported to the US with a share of 92.70% in US$ terms. Exports of black tiger shrimp to the US increased by 4.06% in quantity terms and 0.26% in Rupee terms.
- China emerged as the second largest seafood export destination from India in terms of Quantity and US$ both with an import of 4,05,547 MT worth US$ 1,508.43 million, accounting for 23.37% share in quantity and 18.64% in US$ terms. Exports to China market grew by 51.90% in quantity, 32.02% in Rupee value and 28.37% US$ value.
- The European Union continued to be the third largest destination with an import of 2,07,976 MT worth US$ 1,263.71 million. In this market, frozen shrimp is the major item of exports, registering an increase of 15.12% and 7.20% in Rupee and US$ value, respectively. Unit value in this market shown a growth of 3.77%
- South East Asia is the fourth largest market with an import of 4,31,774 MT worth US$ 1191.25 million. Frozen shrimp is the major item of exports, with 15.16% share by quantity and 35.17% by US$ value with growth of 46.08%. Frozen fish, the second major item of exports, with 36.02% share by quantity and 20.57% by US$ value with growth of 46.84%.
- Japan continued to be the fifth largest importer with a share of 6.29% in quantity and 5.99% in US$

value terms with a growth of 9.99 %. Frozen shrimp continued to be the major item of exports to Japan with percentage share of 71.35% and growth of 5.26% in US$ value.

WHAT IS THE CONTENTION BETWEEN COAL INDIA AND CCI?

Why in news?

- Recently, the Supreme Court held that there was "no merit" in Coal India Ltd (CIL), a public sector undertaking, being excluded from the purview of the Competition Act.
- The Court was hearing the PSU's appeal against the Competition Appellate Tribunal's order which alleged the former of abusing its position.

What was the case about?

- The chain of events goes back to March 2017 when the Competition Commission of India (CCI) had imposed a penalty of ₹591.01 crore on CIL for "imposing unfair/ discriminatory conditions in fuel supply agreements (FSAs) with the power producers for supply of non-coking coal."
- CIL was found to be supplying lower quality of the essential resource at higher prices and placing opaque conditions in the contract about supply parameters and quality.

What did the PSU argue in court?

- Coal India argued that it operated with the principles of 'common good' and ensuring equitable distribution of the essential natural resource. With this objective, it was secured as a 'monopoly' under the Nationalisation Act, 1973 (more specifically, the Coal Mines (Nationalisation) Act, 1973).
- It said that it may have to adhere to a differential pricing mechanism to encourage captive coal production. Differential pricing, which may be inconsistent with market principles, was to ensure the viability of the larger operating ecosystem as well as for pursuing welfare objectives.
- Furthermore, coal supply also has a bearing on larger national policies, for example, if the government were to encourage growth in backward areas through increased allocation.
- The PSU stated that it did not operate in the commercial sphere. It specifically pointed to 345 out of its 462 mines having suffered cumulative losses totalling ₹9,878 crore in 2012-13.

How did the CCI respond?

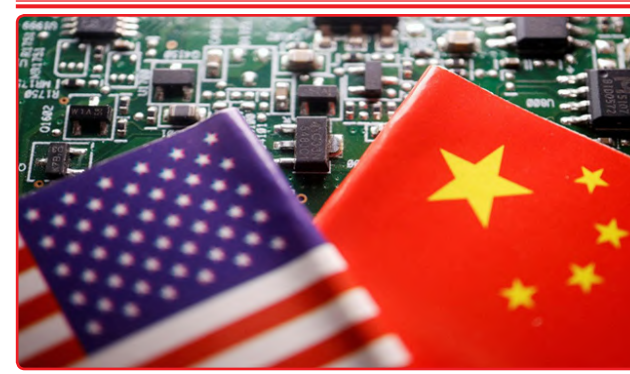
- The Raghavan Committee (2020) report had observed that state monopolies were not conducive to the best interests of the nation. They could not be allowed to operate in a state of inefficiency and should instead, operate amid competition.
- Furthermore, coal ceased to be an 'essential commodity' in February 2007 and the Nationalisation Act too was removed from the Ninth Schedule (laws that cannot be challenged in court) in 2017. Coal India was a fully-government owned entity until the disinvestment in 2010.
- The government's shareholding reduced to 67% with the rest held by private hands. Moreover, it was stated that the CIL directed 80% of its supplies to power companies. The latter would then pass power generated using coal to discoms (distribution companies), who, in turn, would supply power to the final consumer.
- The continual supply of coal, adherence to the contract, reasonableness in the rates and quality of coal also serve a common good, the respondents contended.
- Coal constitutes about 60 to 70% of the costs for power generation companies. Thus, irregular prices and supply will have a significant bearing indirectly on consumers.

What were the SC's observations?

- The court said there was "no merit" in the argument that the Competition Act would not apply to CIL because they are governed by the Nationalisation Act, and it cannot be reconciled with the Competition Act.
- The judgment reinforced the principle of "competitive neutrality" entailing that the Competition Act equally applies to public and private sector enterprises.

INTERNAL SECURITY

CHINA DEVELOPMENTAL SECURITY APPROACH



Context:

- In May 2023, the Cyberspace Administration of China announced that the U.S. chip giant Micron, which had been under investigation by the Cybersecurity Review Office, failed to obtain a security clearance, and that its products posed a threat to national security.
- Consequently, business operators tied to critical information infrastructure were advised not to procure Micron products.
- This is the latest incident in a series of crackdowns by the Chinese government against American consultancies and domestic firms dealing with overseas clients.

What are the other instances?

- Earlier, the Chinese authorities had raided the offices of Capvision, a Shanghai-based consultancy firm that connects lakhs of China-based experts with backgrounds in defence, military, finance, high tech, trade, energy, and medicine among others, to mostly overseas clients.
- Capvision was charged by Chinese security authorities with using economic inducements to steal state secrets and facilitating the transfer of sensitive information sourced from its experts, to its foreign clients. In the process, the company was found guilty of violating several laws relating to national security.
- In April 2023, the offices of American consultancy firm Bain and Co. were raided and its employees in China questioned. While no employee was detained, the authorities seized computers and phones from its offices.

Why is the Chinese government cracking down on such firms?

- In October 2022, the U.S. tightened export controls which would make it harder for China to obtain and manufacture advanced computing chips and supercomputers.
- Therefore, at the outset, the actions by Chinese authorities appear motivated by retribution against the U.S.-led efforts to constrain China's tech advancement, as has been widely reported in the Western media.
- The crackdown on consultancy and due diligence firms is likely to have ripple effects across all overseas businesses operating in China.
- Businesses rely on consultancy firms to navigate the regulatory environment which may prove to be challenging, especially in a country like China where regulatory unpredictability and uncertainty have been a norm in the last few years.

Why has security come to the forefront in Chinese politics?

- China has justified each of the above-discussed actions using national security concerns. However rhetorical as it may sound, the reality is that threat to security has become a pervasive concern in all aspects of governance in China.
- Under President Xi Jinping, Chinese discourse on national security has repeatedly underlined that the idea of 'development' cannot be isolated from that of 'security'.
- On numerous occasions, including at the 20th Party Congress last year and the Two Sessions (the
- China's incessant attempt to securitise its development has meant that non-traditional security issues have acquired greater significance in its developmental narrative.
- And among all the non-traditional security issues, cybersecurity and data/information security seem to concern Chinese authorities the most. This is apparent in their recent attempts to strengthen cybersecurity and counter-espionage laws.

Counter-Espionage Law:

- The recently amended Counter-Espionage Law that will come into effect from July 1, 2023, aims to treat all "documents, data, materials, and items relating to national security and interests," at par with state secrets, thus, broadening the scope of espionage.
- It also expands the definition of espionage to include cyberattacks against state organs or critical information infrastructure.
- The revised law also empowers authorities to seize data, electronic equipment, information on personal property, and even ban border crossing.
- The recent crackdowns are thus reflective of this approach to 'developmental' security. The existing view within the Chinese administration is that several foreign businesses operating in China are indulging in espionage.

What next?

- China now, finds itself in an odd spot where development and security are applying diametrically opposing forces, thereby creating a regulatory dilemma.
- While development requires "reform and opening up," and creating a business-friendly environment as the Party says, the need to balance development with security warrants enforcing restrictive measures which impinge upon free economic activity.
- The victims of the recent crackdowns not only have the U.S.-China competition to blame but also China's evolving national security discourse.

What it holds for India?

- However, from India's perspective, one cannot help but notice the outright contradiction that China's discourse presents when it comes to its relationship with India.

- While China insists on the need to hyphenate development with security, it calls on India to keep the border issue (security) at its proper place and not let it derail the overall relationship (economics and development) with China.

INDIA TO BUY 31 PREDATOR DRONES FROM US FOR $3.5 BN

Why in news?

- Recently, India's Defence Acquisition Council (DAC) approved the purchase of US-Made Predator drones.
- The deal will cost India around $3.5 billion for 31 high-altitude, long-endurance Predator-B drones.
- India already operates two Sea Guardian drones, an unarmed version of the deadly Predator series.

What are Predator Drones?

- Developed by a San Diego-based defence contractor, General Atomics, Predators drones are considered the best in the business.
- Primarily developed to conduct surveillance-related operations, one of these drones famously identified Osama bin Laden in Afghanistan in 2000.
- Thereafter, armed versions of the Predator drones were developed that came with lethal Hellfire missiles.
- These drones can operate at heights up to 50,000 feet for over 27 hours with a payload capacity of 1,746 kg.
- India is interested in the MQ-9B SkyGuardian and MQ-9B SeaGuardian variants of these drones, which are designed to operate via satellite and have endurance of more than 30-40 hours.
- These drones can fly in all weather conditions with payloads of more than 2000kg.

Predator drones operational history: A brief

- Since it started serving with the American armed forces in 1995, Predator drones have seen extensive usage in the conflict zone.
- The Predator was first deployed over Bosnia in the summer of 1995 and General Atomics was awarded the first contract of series production in August 1997.
- Later, it was deployed in Afghanistan, Iraq, Yemen, Libya, Somalia, and Syria to support operational requirements.

Where does India stand in the drone race?

- India is taking a keen interest in improving indigenous know-how of drone technology and its liberal policies and other initiatives like drone shakti are supporting the market's growth.
- Drone Shakti is a production-linked incentive scheme designed to bolster domestic drone development.

DRDO Rustom:

- The DRDO Rustom is a medium-altitude long-endurance unmanned air vehicle (UAV) being developed by the Defence Research and Development Organisation. It has been derived from National Aerospace Laboratory (NAL's) LCRA (Light Canard Research Aircraft developed by the team that worked under the late Prof Rustom Damania in the 1980s.

Three variants:

- The Rustom will have three variants namely, Rustom-1, a tactical UAV with an endurance of 12 hours.
- The second is Rustom-H, a larger UAV with a flight endurance of more than 24 hours which will also have a higher range and service ceiling. Service ceiling refers to the maximum height an aerial vehicle can achieve.
- The third, Rustom-2 (TAPAS-BH-201) will be a UAV based on Rustom-H. It is being developed on the lines of General Atomics MQ-1 Predator. Its first flight took place in November 2016.

INDIA SUCCESSFULLY TEST-FIRES NIGHT LAUNCH OF BALLISTIC MISSILE 'AGNI PRIME'

Why in news?

- India has successfully carried out a night launch of new generation nuclear capable ballistic missile 'Agni Prime' from the Abdul Kalam Island off the coast of Odisha.
- The first pre-induction night launch of the missile with a strike range of 1,000 to 2,000 km was carried out on Wednesday by the Defence Research and Development Organisation (DRDO) and the elite strategic forces command.

Agni-V:

- In December, India successfully test-fired Agni-V missile that can strike targets at ranges up to 5,000 km.
- Agni-V can bring almost the entire Asia including the northernmost part of China as well as some regions in Europe under its striking range.
- The Agni 1 to 4 missiles have ranges from 700 km to 3,500 km and they have already been deployed.
- In April, India successfully carried out the maiden flight trial of an endo-atmospheric interceptor missile from a ship off the coast of Odisha in the Bay of Bengal as part of its ambitious ballistic missile defence programme.

Key Highlights:

- The Agni Prime is a two-stage canisterised solid propellant ballistic missile with dual redundant navigation and guidance systems.
- It first underwent testing in June 2021 and has a range of 1000 to 2000 km. Compared to the older Agni series missiles, it is lighter.
- This successful flight test has paved the way for the induction of the system into the Armed Forces.

Significance:

- The purpose of the trial of the sea-based missile was to engage and neutralize a hostile ballistic missile threat thereby elevating India into an elite club of nations having such a capability.
- India has been developing capabilities to intercept hostile ballistic missiles both inside and outside the earth's atmospheric limits.

Way Forward:

- The test-firing met all the desired objectives and that it paved the way for induction of the system into the armed forces.
- The test-firing of the missile came amid India's lingering border row with China.

ENVIRONMENT

HIGH ROAD TO DUBAI COP28

Why in news?

- Carbon markets will be a key discussion topic at the Bonn Climate Change Conference in Germany, scheduled from June 5-15, 2023.

Details:

- The Bonn Conference will deal with technical details to feed discussions at the 28th Conference of Parties (COP28) to the United Nations Framework Convention on Climate Change, which will be held in December 2023 in the United Arab Emirates.
- COP27, hosted by Egypt in 2022, led to securing the establishment of a loss and damage fund, which had been negotiated upon and postponed for over three decades.
- The Bonn Conference will advance the work on how countries can cooperate to fulfil their nationally determined contributions (NDC) through provisions made under Article 6 of the UN-mandated Paris climate pact. More than 66 per cent of countries plan to use carbon credits to meet their NDCs.

Carbon markets & credits:

- Carbon markets are trading systems in which carbon credits are sold and bought, according to the UN Development Programme.
- Article 6 of the Paris Agreement deals with trading carbon credits. Clause 6.2 allows countries to trade greenhouse gas emission reduction outcomes, and 6.4 establishes a market for trading these reductions between countries under UN supervision.
- Credits are certificates representing one tonne of carbon dioxide equivalent that has either been prevented from entering (emissions reductions) or removed from the atmosphere (CO2 removals). They can be generated from projects such as restoring forests, setting up renewable energy, managing industrial gases, etc.
- In 2021 at COP26 in Glasgow, parties created a rulebook for carbon markets. But the rulebook is far from complete. Negotiators still have to work out the architecture of the market and how emission reductions have to be reported.

What happened at COP27?

- Article 6.4 had a rocky start at CoP27. The Supervisory Body, tasked with overseeing the Article 6.4 mechanism recommended carbon removals. This was criticised by civil society groups and indigenous peoples.
- 'Carbon removal' means removing carbon dioxide from the atmosphere. It can be land-based, like afforestation or reforestation, ocean-based and engineering-based such as direct air capture (where big machines suck CO2).
- The Supervisory Body's recommendations provide a broad definition of removals. It does not distinguish between types of removals, including each activity's

requirements, risks and implications, according to Geoengineering Monitor, a project of Biofuelwatch, Heinrich Boell Foundation and the Global Forest Coalition. There were also concerns over human rights violations.

- Towards the end of the negotiations, parties asked the supervisory body to re-examine the recommendations on removals after considering the views of the parties and observers.

What to expect at Bonn?

- Under Article 6.2 discussion at Bonn, the Subsidiary Body for Scientific and Technological Advice (SBSTA) will recommend additional rules to help operationalise the cooperation between countries.
- This includes discussing the special circumstances of least developed countries and small island developing states in the mechanism and transfer of Internationally transferred mitigation outcomes (ITMOs), a unit of trade. ITMO trading allows countries to purchase ITMOs from other countries
- It would also address the question of when information should be treated as confidential regarding mitigation efforts, their transfer, and appropriation. The discussion would also cover other agendas, such as corresponding adjustments and the process for authorising and using ITMOs.
- SBSTA's agenda for Article 6.4 involves further work on the rules, modalities and procedures developed last year at Sharm-el-sheikh.

Discussions will focus on three key aspects:

- Determining if 'emission avoidance' (credits on projects that aims to prevent deforestation or pump less oil and gas) and 'conservation enhancement' (which could partially include land use emissions) activities fall within Article 6.4's scope.
- Establishing the specifics of the connection between the mechanism registry, international registry, and other registries, including interoperability between them. A registry is a centralised accounting and reporting platform.
- Addressing the necessary information required for host parties' authorisation statements on Article 6.4 Emissions Reductions (A6.4ER) transfers. The authorisation statement will declare whether the country requires A6.4ER for its own NDCs or other purposes.
- Further, the Supervisory body will discuss removal activities based on the information note released by the secretariat. The note has attracted negative attention for its favoured stance on 'nature-based removals' as against 'engineered removals'.

What should lie ahead?

- After adopting a rule book for international cooperation at Glasgow, discussions on Article 6 have taken on a subdued tone, primarily focusing on procedural and technical questions. However, with increasing interest in meeting climate goals through markets, parties and non-party stakeholders are interested in having more clarity on the full operationalisation of Article 6.
- The work done so far on Article 6.2 has enabled countries to start implementing the framework, with Switzerland signing bilateral agreements with multiple countries and Ghana providing the first set of authorisations for ITMOs to be used by Switzerland.
- The supervisory body needs to address several outstanding agendas, such as developing methodology, organising registries (including the overall infrastructure), and clarifying the activities that would be recognised as carbon removals to operationalise Article 6.4.

INCREASED RAINFALL ALONE WILL NOT HELP GROUNDWATER RECOVERY

Context:

- The role of increased evapotranspiration due to warming climate, which will limit water availability for groundwater recovery.

Depletion of groundwater:

- Rapid depletion of groundwater in north India has become a norm during the last few decades. Between 2002 and 2022, about 95% of India's groundwater depletion occurred in north India. Groundwater use and summer monsoon rainfall variability are the two main drivers of groundwater storage.
- Climate change can throw new challenges for the sustainability of groundwater due to increased groundwater pumping to meet irrigation demands for crops. Also, a warming climate will increase the frequency of hydroclimate extremes, floods and droughts.
- A less discussed aspect is the role of increased evapotranspiration due to warming climate, which will limit water availability for groundwater recovery. But its role will be less as increased groundwater use for irrigation will be the main driver of groundwater usage.

Recent study:

- A two-member team from IIT Gandhinagar used observational groundwater well data, and satellite observations from the Gravity Recovery and Climate Experiment (GRACE) and hydrological model simulations under future emission scenarios to understand the variability of groundwater storage under the warming climate.
- They found that the projected increase in summer monsoon due to climate change notwithstanding, recovery of the depleted groundwater in north India will be insufficient if there is continued use of groundwater at current levels for irrigation.

Key findings:

- They found that excessive pumping from non-renewable groundwater storage will aggravate groundwater loss.
- While most of the current observation wells are in the shallow aquifer, pumping of groundwater for irrigation in the Indo-Gangetic Plain is predominantly from deeper aquifers. So a warming climate may not have sufficient control over the overall groundwater storage variability in the region.
- The study provides two critical insights, the periods of high precipitation will help in partial recovery of groundwater even when groundwater extraction continues or even increases. However, the projected increase in precipitation may not directly translate to an overall increase in groundwater storage. The opposing influence of evapotranspiration will become dominant in the far period and at higher warming levels.
- As per climate projection, the summer monsoon rainfall is projected to increase by 6-8%, and this increase is expected to help recover the lost groundwater.

Efficient irrigation:

- The possibility of increased frequency of droughts cannot be ruled out. While the impact of droughts at longer frequencies may be less, consecutive years of drought can adversely affect groundwater storage as recharge will be less while extraction of groundwater for irrigation will be higher than when summer monsoon rainfall is normal.
- There can even be more challenging situations in future despite the projected increase in rainfall due to climate change. There is a compulsion to make irrigation more efficient and shift crop growing and procuring areas.

Way Forward:

- The focus should thus be to promote groundwater conservation to ensure long-term sustainability as it plays an important role especially during periods of drought. This applies even when increased rainfall can increase the recharge of groundwater.

SDG 7, WORLD STILL OFF-TRACK FROM ACHIEVING UNIVERSAL ENERGY ACCESS TO ALL, SAYS UN REPORT

Why in news?

- Recently, the report titled, 'Tracking SDG7: The Energy Progress Report 2023' was released.
- The five SDG 7 custodian agencies, International Energy Agency (IEA), International Renewable Energy Agency, United Nations Statistics Division, World Bank and the WHO, collaborated to release the document.

Details:

- SDG 7 is to "ensure access to affordable, reliable, sustainable and modern energy for all."
- Several major economic factors are impeding the realisation of SDG 7 globally, like uncertain macroeconomic outlook, high levels of inflation, currency fluctuations, debt distress in many countries, lack of financing, supply chain bottlenecks, tighter fiscal circumstances and soaring prices for materials.
- Certain policy responses to the global energy crisis appear likely to improve the outlook for renewables and energy efficiency. However, other necessary policy actions, as well as financial flows, continue to lag.
- This particularly concerns lacking universal access to electricity and clean cooking in developing economies, with projections indicating that SDG 7 will not be reached by 2030.

Key Highlights:

- The uptake of renewable energy (target 7.2) has grown since 2010, but efforts must be scaled up substantially.
- The rate of improvement in energy efficiency (target 7.3) is not on track to double by 2030, with the current trend of 1.8 per cent falling short of the targeted increase of 2.6 per cent each year between 2010-2030.
- Progress on target 7.a, to increase international public financial flows supporting clean energy in developing countries began to decline even before the onset of the COVID-19 pandemic, the paper pointed out. Financial resources were more than a third lower since 2020 than the average of the previous decade (2010–19).

- As financial flows have contracted for the third year in a row, they have become increasingly concentrated in a small number of countries.
- The decreasing trend in international public financial flows may delay the achievement of SDG 7, especially for the least-developed countries (LDCs), landlocked developing countries, and small island developing states.

Global status:

- Globally, access to electricity grew by an annual average of 0.7 percentage points between 2010 and 2021, rising from 84 per cent of the world's population to 91 per cent.
- The number of people without electricity almost halved during the period, from 1.1 billion in 2010 to 675 million in 2021. The pace of annual growth slowed during 2019–21 to 0.6 percentage points.
- The global population lacking access to clean cooking fell from 2.9 billion in 2010 to 2.3 billion in 2021, but the goal of universal access by 2030 remains elusive.
- Some 1.9 billion people would still be without access to clean cooking in 2030, the report said. If current trends continue, almost six out of ten people without access to clean cooking in 2030 would reside in Sub-Saharan Africa.

Energy intensity:

- SDG target 7.3 calls for doubling the global rate of improvement in energy intensity over the average rate during 1990–2010 — which means improving energy intensity by 2.6 per cent per year between 2010 and 2030.
- However, progress between 2010 and 2020 averaged only 1.8 per cent. To make up for lost ground, improvement in energy intensity must now exceed 3.4 per cent globally from 2020 to 2030—twice the rate achieved in the past decade.

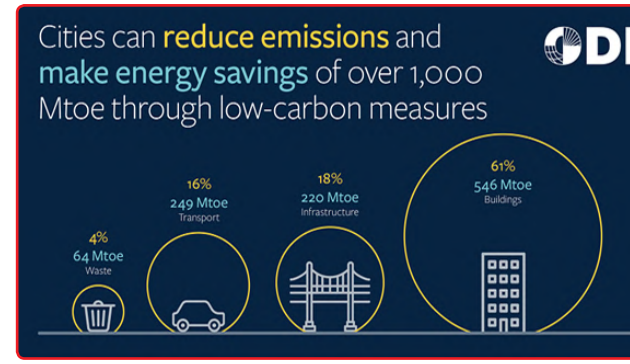
SDGs:

- The 2030 Agenda for Sustainable Development, also called the 2030 Agenda, was launched by a UN Summit in 2015 and is aimed at ending poverty in all its forms.
- There are 17 SDGs, which are an urgent call for action by all countries in a global partnership. 2023 marks the halfway point for achieving SDGs by 2030.
- SDG 7 includes reaching universal access to electricity and clean cooking, doubling historic levels of efficiency improvements, and substantially increasing the share of renewables in the global energy mix.

HOW CAN WE TRANSITION TO A LOW-CARBON CITY?

Context:

- In 2020, cities dumped a whopping 29 trillion tonnes of carbon dioxide into the atmosphere. Therefore, given the significant impact that cities have on the environment, low-carbon cities are crucial to mitigate the effects of climate change.



- Transitioning to low-carbon or even net-zero cities requires to integrate mitigation and adaptation options in multiple sectors. This is called the 'sector-coupling approach', and it is necessary to decarbonise urban systems.

Why are energy-system transitions important?

- An energy-system transition could reduce urban carbon dioxide emissions by around 74%. With rapid advancements in clean energy and related technologies and nosediving prices, we have crossed the economic and technological barriers to implementing low-carbon solutions.
- The transition must be implemented both on the demand and the supply side.
- Mitigation options on the supply side include phasing out fossil fuels and increasing the share of renewables in the energy mix, and using carbon capture and storage (CCS) technologies.
- On the demand side, using the 'avoid, shift, improve' framework would entail reducing the demand for materials and energy, and substituting the demand for fossil fuels with renewables.
- Secondly, in order to address residual emissions in the energy sector, it is must to implement carbon-dioxide removal (CDR) technologies.

What are the different strategies?

- The strategies to mitigate and adapt to low-carbon varies based on a city's characteristics. Transitioning to renewable energy sources is not as simple as replacing fossil fuels with clean energy. These considerations are a city's spatial form, land-use pattern, level of development, and the state of urbanisation.
- An established city can retrofit and repurpose its infrastructure to increase energy efficiency, and promote public as well as active transport like bicycling and walking.
- A rapidly growing city can try to colocate housing and jobs, by planning the city in a way that brings places of work closer to residential complexes, thus reducing transport energy demand. Such cities can

also leapfrog to low-carbon technologies, including renewables and CCS.

- New and emerging cities have the most potential to reduce emissions using energy-efficient services and infrastructure, and a people-centric urban design. They can also implement building codes that mandate net-zero energy use and retrofit existing buildings, all while gradually shifting to low-emission construction material.

How can an energy transition be just?

- Energy systems are directly and indirectly linked to livelihoods, local economic development, and the socio-economic well-being of people engaged in diverse sectors. So a one-size-fits-all approach is unlikely to ensure a socially and environmentally just transition.
- Broadly, the energy supply needs to be balanced against fast-growing energy demand (due to urbanisation), the needs of energy security, and exports.
- Additional justice concerns include land dispossession related to large-scale renewable energy projects, spatial concentration of poverty, the marginalisation of certain communities, gendered impacts, and the reliance on coal for livelihoods.

Way Forward:

- Ensuring a transition to low-carbon energy systems in cities at different stages of urbanisation, national contexts, and institutional capacities requires strategic and bespoke efforts. They must be directed at governance and planning, achieving behavioural shifts, promoting technology and innovation, and building institutional capacity.
- There is also need to adopt a comprehensive approach to address the root causes of energy and environmental injustices.
- This includes mitigation and adaptation responses that engage multiple stakeholders in energy governance and decision-making, promoting energy-efficiency, scaling up climate investments, and capturing alternate knowledge streams (including indigenous and local lived experiences).

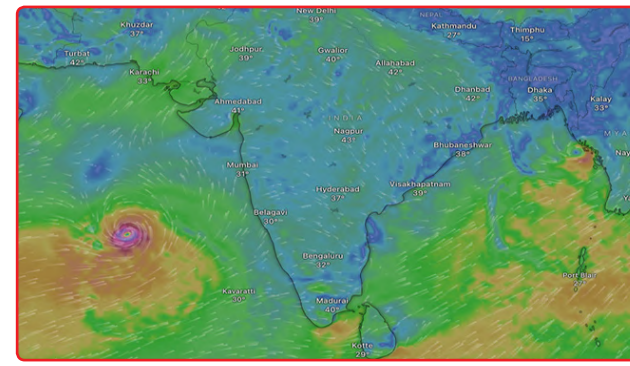
CYCLONE EFFECT ON MONSOON ONSET

Why in news?

- The cyclone formations in the pre-monsoon cyclone season is in news, closer to the monsoon onset, arguably due to the influence of a warmer Arctic Ocean on the winds over the Arabian Sea.

Impact of global warming:

- The impact of global warming on the monsoons are manifest in its onset, withdrawal, seasonal total rainfall, and extremes. Global warming also affects the cyclones over the Indian Ocean and the typhoons over the northwestern Pacific Ocean.



- The monsoon is of course also affected by the three tropical oceans; Indian, Atlantic, and Pacific; the 'atmospheric bridge' from the Arctic; and the oceanic tunnel as well as the atmospheric bridge from the Southern Ocean (a.k.a. the Antarctic Ocean).
- A 'bridge' refers to two faraway regions interacting in the atmosphere while a 'tunnel' refers to two remote oceanic regions connecting within the ocean.

Why does a cyclone's position matter?

- Some cyclones in the North Indian Ocean have had both positive and negative impacts on the onset of the monsoon. Since the circulation of winds around the cyclones is in the anticlockwise direction, the location of the cyclone is critical as far as the cyclone's impact on the transition of the monsoon trough is concerned.
- The monsoon trough is a low-pressure region that is a characteristic feature of the monsoons. For example, if a cyclone lies further north in the Bay of Bengal, the back-winds blowing from the southwest to the northeast can pull the monsoon trough forward, and assist in the monsoon's onset.

Positive aspect:

- Earlier in 2023, the Bay of Bengal had Cyclone Mocha develop in the first half of May and intensify briefly into a 'super cyclonic storm', before weakening rapidly upon landfall.
- Mocha's northwest to east trajectory over the Bay was the result of unusual anticyclones (which rotate clockwise) that have been parked over the Arabian Sea and the Bay of Bengal since March.
- Mocha dissipated on May 15 and the back-winds helped the monsoon set in on time over the Andaman and Nicobar Islands.

Negative aspect:

- One severe consequence of the anomalous anticyclones since March is that both the Arabian Sea and the Bay of Bengal have warmed by more than 1° C in the pre-monsoon season.
- The late-season cyclone Biparjoy is still chugging along in the warm Arabian Sea and may well rapidly intensify i. before making landfall.

Mawar, Biparjoy, and Guchol:

- Cyclone Biparjoy is not interacting much with the monsoon trough at this time. However, its late birth

as well as the late onset of the monsoon are both closely related to typhoons in the northwestern Pacific Ocean. On May 19, Typhoon Mawar was born and dissipated by June 3.

- Mawar qualified as a 'super typhoon' and is thus far the strongest typhoon to have taken shape in May. It is also the strongest cyclone of 2023 so far.
- Tropical storm Guchol is now active just to the east of the Philippines and is likely to continue northwest before veering off to the northeast. These powerful typhoons are thirsty beasts and demand moisture from far and wide.

Impact of Mawar:

- Mawar pulled winds across the equator into the North Indian Ocean, setting up southwesterly winds over parts of the Arabian Sea and the Bay of Bengal. 'Southwesterly' means blowing from the southwest.
- Southwesterly winds over the Arabian Sea are welcome news: they bring large quantities of moisture onto the Indian subcontinent. On the other hand, southwesterly winds over the Bay of Bengal are bad news for the monsoon.
- The monsoon winds over the southern Bay of Bengal sweep in from the southwest and west, but they turn around and head northwest towards India from the southeast.
- Winds were southwesterly over the entire Bay when Mawar was active. This continues to be the case now due to Guchol, which has become a 'severe tropical storm' now.
- Winds have been blowing strongly towards the northeastward over the Bay, a key reason why the monsoon trough has been struggling to reach Kerala.

Way Forward:

- Fortunately, a late monsoon onset does not necessarily indicate a monsoon deficit. Then again, 2023 is unique, with an impending El Niño.

IIT-M GENERATES HYDROGEN FROM SEAWATER USING SOLAR ENERGY

Why in news?

- Recently, researchers from the Department of Physics at IIT-Madras have developed critical components for a highly efficient, cost-effective way to electrolyse seawater to generate hydrogen.

Background:

- State-of-the-art alkaline water electrolyser technology is energy-intensive, requires an expensive oxide-polymer separator, and uses fresh water for electrolysis.
- They addressed each of these challenges by developing simple, scalable and cost-effective alternatives that are highly efficient in splitting seawater and generating hydrogen.

New electrolyser:

- In place of pure or fresh water, they developed an electrolyser using alkaline seawater. They used a carbon-based support material for the electrodes instead of metals to almost eliminate the possibility of corrosion.
- They also designed and developed transition metal-based catalysts that can catalyse both oxygen and hydrogen evolution reactions.
- The catalyst enhances the production of both hydrogen and oxygen even when impurities and chemical deposition on one of the electrodes takes place.
- Also, they have developed a cellulose-based separator that is very economical and serves the purpose of allowing hydroxide ions to pass through but prevents oxygen and hydrogen that are generated from crossing-over.
- They have optimised all the parameters such that the water electrolyser can directly use photovoltaic-derived voltage to split seawater and generate green hydrogen and oxygen; oxygen can be used elsewhere.

How it works?

- Alkaline water electrolyser consists of two half-reactions occurring at the anode and cathode. At the cathode, water dissociates into H+ and hydroxide ions, and the H+ ions get converted into hydrogen. The hydroxide ions produced at the cathode permeate through the separator and oxygen is generated at the anode.
- When seawater is used for electrolysis, hypochlorite formation occurs at the anode. Hypochlorite is responsible for corrosion of the electrode support material, and competes with the oxygen evolution reaction thus reducing the amount of oxygen produced.
- At the cathode, the hydrogen evolution reaction is slowed down when several impurities get adsorbed on the electrode surface.
- The electrodes have a support material that is coated with a catalyst. Since conventional metal support materials get easily corroded when seawater is used, they developed a carbon-based support material.
- The transition bimetals present in the catalyst are more selective towards oxygen evolution reaction

than hypochlorite formation. Thus, the challenge of hypochlorite formation reducing oxygen production is taken care of.

- Similarly, even while the cathode continues to adsorb impurities, the catalyst promotes the hydrogen evolution reaction, which helps in the increased production of hydrogen.

The separator:

- Another unique feature is the novel separator that has been developed by the team. When alkaline electrolyte is used, the anode and cathode are separated with a separator.
- Since zirconium oxide-based material that is routinely used is expensive, they came up with a cellulose-based separator which allows the hydroxide ions to pass through from the cathode to the anode. But it minimises the crossover of hydrogen and oxygen that is generated.

Outcome:

- Using the assembled electrolyser, they have demonstrated an overall seawater splitting voltage of 1.73 V at 10 mA/sq.cm (a benchmark current density corresponding to about 12% efficient solar-to-fuel conversion device under 1 sun illumination) at 26 degrees C.

WHAT IS HAPPENING TO ARCTIC SEA ICE?

Why in news?

- A recent study says that the loss of Arctic sea ice is inevitable in the decades ahead, even if the world somehow gets its act together and sharply reduces carbon emissions.

Arctic sea ice:

- The massive sheets of ice that pad the Arctic region play a major role in influencing global climate and the rise and fall in Arctic sea temperatures.
- During winter, the sea ice envelops most of the Arctic Ocean and in summer, a portion of it melts due to being exposed to longer periods of sunlight and elevated temperatures. Sea ice normally melts and is at its thinnest and most sparse in mid-September, when the area covered by ice is roughly half the size of the winter maximum.
- With the onset of winter and dipping temperatures, the ice begins to expand and thicken, all the way until March when it reaches its zenith.

Importance:

- Sea ice is light-coloured and therefore reflects more sunlight back to space than liquid water, thus playing a vital role in keeping polar regions cool and maintaining the earth's energy balance.
- Sea ice also keeps the air cool by forming a barrier between the cold air above and the relatively warmer water below.
- As the amount of sea ice decreases, the Arctic region's cooling effect is reduced, and this may initiate a 'feedback loop' whereby ocean warming caused by more absorption of solar energy leads to an even greater loss of sea ice and further warming.
- Changes in sea ice can affect biodiversity and impact mammals such as polar bears and walruses, which rely on the presence of sea ice for hunting, breeding, and migrating. The reduction in ice cover also affects the traditional subsistence hunting lifestyle of indigenous Arctic populations such as the Yup'ik, Iñupiat, and Inuit.
- On the other hand, reduced ice can present "commercial and economic opportunities" with the opening up of shipping lanes and increased access to natural resources in the Arctic region. This has already provoked global competition with several countries, including India, vying for greater influence in groups such as the Arctic Council that governs access to Arctic resources.

What does the new study say?

- That the Arctic sea ice is decreasing is well-known and acknowledged in several reports of the Intergovernmental Panel on Climate Change (IPCC) and it is widely expected that the world will see its first 'sea-ice free summer' before 2050.
- This, however is under the assumption that global emissions will drive temperatures to beyond 4.5°C making the Arctic ice-free by 2081-2100.
- There was uncertainty on whether this sea-ice-free scenario applied to situations where carbon emissions were curbed enough to ensure that temperature-rise was restricted to say 1.5°C or 2°C, as envisaged in the Paris Agreement.
- The recent study confirms that there is no scenario under which the Arctic sea ice can be saved in summer. Ever since satellite records began to monitor the Arctic, the rate of loss has been nearly 13% every year.

What can be done?

- The diminished sea ice while warming the Arctic also leads to a weakening of the polar jet streams, which are currents of air that form when warm and cold air meet.

- This weakening has been linked to rising temperatures and heatwaves in Europe as well as unseasonal showers in northwest India.
- While the ice-free summer may be inevitable, reducing carbon emissions might mean being better able to adapt to climate 'tipping points.'

THE STATUS OF TRANSGENIC CROPS IN INDIA

Why in news?

- Three States, Gujarat, Maharashtra and Telangana, have deferred a proposal, approved by the Centre's Genetic Engineering Appraisal Committee (GEAC), to test a new kind of transgenic cotton seed that contains a gene, Cry2Ai, that purportedly makes cotton resistant to pink bollworm, a major pest.
- This conflict shows that a broad acceptance of genetically modified crops continues to be elusive.

What is the status of transgenic crops in India?

- There are an array of crops; brinjal, tomato, maize, chickpea in various stages of trials that employ transgenic technology. However, cotton remains the only transgenic crop that is being commercially cultivated in India.
- After a long hiatus, the GEAC, the apex technical body charged with evaluating proposals for testing genetically modified (GM) seeds, approved the environmental release of Mustard hybrid DMH-11 and its parental lines, during its 147th meeting on 18 October, 2022 for seed production and testing. This is one step away from full commercial cultivation.
- However, the GEAC, which is under the Union Environment Ministry, isn't the final arbiter in the case of GM crops.

Litigation in SC:

- There is a long-standing litigation in the Supreme Court on the permissibility of allowing transgenic food crops in farmer fields based on petitions filed by activist Aruna Rodrigues and Gene Campaign, an NGO.
- Following the GEAC approval for DMH-11, the petitioners approached the apex court asking for a stay on the release of the crop because it would encourage farmers to spray herbicides, which are banned in India. Hearings on this case are still ongoing. In 2017, the GEAC had accorded a clearance for GM mustard, but went back on its decision and imposed additional tests. In 2010, the GEAC had approved GM brinjal, but this was put on an "indefinite moratorium" by the United Progressive Alliance government.

What is the process of regulating transgenic crops in India?

- The process of developing transgenic crops is an elaborate one as inserting transgenic genes into plants to elicit a sustained, protective response is a mix of both science and chance.
- There are multiple safety assessments done by committees before they are cleared for further tests in open plots of lands, which are located at either agricultural universities or are plots controlled by the Indian Council for Agricultural Research (ICAR).
- A transgenic plant can apply for commercial clearance, only after it has proven to be demonstrably better than comparable non-GM variants on claimed parameters (for instance, drought tolerance or insect resistance) without posing ecological harm to other species that may be being cultivated in the vicinity.
- Open field trials often take place over multiple crop seasons, and types of geographical conditions, to assess its suitability across different States.

Why have Gujarat, Maharashtra and Telangana rebuffed the GEAC?

- The cotton seed has been developed by the Hyderabad-based Bioseed Research India with Cry2Ai which makes it resistant to pink bollworm. The first generations of transgenic cotton had been developed to inure cotton against a more widespread pest called American bollworm.
- The Cry2Ai seed has passed preliminary, confined trials and was recommended by the GEAC to be tested in farmer's fields at Telangana, Maharashtra, Gujarat and Haryana.
- Agriculture being a State subject in most cases, companies interested in testing their seeds need approvals from the States for conducting such tests. Only Haryana gave permission for such tests.
- Following these responses, the GEAC has asked the Department of Biotechnology (DBT) and the ICAR to "jointly organise capacity-building activities with regard to GM crops for apprising the State/UT Government(s) about the technology involved and the regulatory framework in place for evaluation of these GM crops."

Are there changes in the offing in process of regulation of GM crops?

- The GEAC consists of a panel of plant biotechnologists and is headed by a senior official of the Environment Ministry and co-chaired by the scientist of the DBT.
- To resolve the issue of States not according approvals on testing, because of differing attitudes to GM crops,

the GEAC is considering a proposal by the DBT to declare some regions across India as 'notified testing sites'.
- There are 42 such proposed sites and, if it goes through, companies wanting to conduct trials of GM crops at these locations won't need the permission of States for trials.

HUMAN GROUNDWATER EXTRACTION HAS AFFECTED THE EARTH ROTATION, STUDY

Why in news?
- Groundwater extraction resulted in the earth's axis tilting nearly 80 cm to the east, a new study has found.
- It also found that nearly 2,150 billion tonnes of groundwater has been pumped and drained into the oceans in 1993-2010, making it one of the important contributors to global sea-level rise.

Polar motion:
- The earth's rotational pole is the point along which the planet rotates. This point, which lies on the axis of rotation of the planet, moves in a process called polar motion. In other words, the location of the earth's pole varies relative to the earth's crust.
- Scientists have been able to track this motion relative to astronomical phenomena such as the centres of bright galaxies or quasars.
- They have also known for a long time that the movement of water can affect the earth's rotation. A study published in 2016, for example, showed how the movement of water around the world contributed to the wobble in the earth's axis.

Highlights of the study:
- To bridge this gap, a group of scientists at the Seoul National University used a climate model that linked the shift in the earth's axis with the movement of water through melting ice caps and glaciers.
- The scientists added the effects of water stored in reservoirs and dams but to no avail.
- The model only matched the observed drift of the axis once they added groundwater to the equation.

Findings:
- They said that the location of groundwater depletion is important because that affects how much the axis wanders. Using their model, they found that pumping groundwater from midlatitude areas would impact the drift the most.
- They also found that the most amount of groundwater redistribution took place in northwest India and western North America, both situated at mid-latitudes.
- The also found that enough groundwater was pumped from underground reservoirs or aquifers to cause the global sea level rise of 6.24 mm between 1993 and 2010.

Groundwater depletion in India:
- Groundwater depletion has been a particular concern across India since the last decade. About 95% of India's groundwater depletion was traced to north India where groundwater is primarily used for irrigation.
- Punjab, Haryana, Delhi, and western Uttar Pradesh have critical groundwater levels due to the indiscriminate use of groundwater, while Rajasthan and Gujarat have low groundwater levels due to arid climate.
- Groundwater availability is also low in parts of Karnataka, Tamil Nadu, Telangana, and Andhra Pradesh due to the crystalline nature of the aquifers found here.

MELTING HINDU KUSH HIMALAYAS WILL DECREASE WATER IN RIVER BASINS BY 2100, WARNS ICIMOD

Why in news?
- Recently, the Water, Ice, Society, and Ecosystems in the Hindu Kush Himalaya (HI-WISE) report from the International Centre for Integrated Mountain Development (ICIMOD) was relased.

Key Highlights:
- As Himalayan glaciers melt due to climate change, water availability in the Ganges, Indus and other river basins in the Hindu Kush region is set to increase in the short term and decrease in the long term.
- The contribution of water from glaciers will increase through 2050 and then decrease by 2100.
- As the glaciers continue to melt and get smaller, the water eventually starts to decrease. This point

is called peak water, when the change occurs from increasing glacier runoff to decreasing glacier runoff.
- Many areas around the world have passed "peak water" and communities are dealing with less glacier meltwater.

Findings on Hindu Kush region:
- In the Hindu Kush region, melting snow and glaciers contribute significantly to river and groundwater flows. Rivers primarily get water from snowmelt in April-June and glacier melt during June-October. They also replenish aquifers.
- The Hindu Kush Himalayas have seen a 65 per cent faster loss of glacier mass. The glaciers lost a mass of 0.28 metres of water equivalent per year (m we) between 2010 and 2019, compared to 0.17 m we per year between 2000-2009.

Decline in snowfall:
- A decline in snowfall of 30–50 per cent is predicted to occur in the Indus Basin, 50–60 per cent in the Ganges, and 50-70 per cent in the Brahmaputra between 2070 and 2100 compared to the average snowfall between 1971 and 2000.
- As for snow, water runoff from this source has already fallen between 1979 and 2019 and is set to fall further, jeopardising the livelihoods of 129 million farmers in the Indus, Ganges and Brahmaputra basins. The number of days with snow cover has decreased by five days per decade.
- In the Brahmaputra River basin especially, the trend in snow cover area since 2002 shows a clear downward trend.

Impact on communities:
- The decreasing snow cover could dry up springs, which is bad for agriculture. Plants are now more directly exposed to the cold weather, when they could hide under a blanket of snow earlier.
- About 83 per cent of springs, the main source of water for mountain communities, are replenished through snowmelt and glacier melt. As the snow cover decreases, it will have dire consequences for the 240 million people living in the mountains.
- Variations in snow cover make it harder for mountain communities to adapt.

WHAT IS THE NEW COLLECTIVE QUANTIFIED GOAL?

Why in news?
- The recently-concluded Bonn climate conference in Germany, expected to outline the political agenda for the crucial end-of-year Conference of Parties-28 (COP28) in Dubai, was critical for reviewing and reforming the climate finance architecture.
- The conference has exposed a gaping hole in the funding needed to pay for climate action.

What is the NCQG?
- A commitment of '$100 billion per year till 2020' to developing nations from developed countries was a target set at the Conference of Parties (COP) in 2009. But estimates since then show addressing climate change may cost billions, and even, trillions of dollars.
- Therefore, the 2015 Paris Climate Agreement agreed on setting a New Collective Quantified Goal (NCGQ) for climate financing prior to 2025, a reference point which accounts for the needs and priorities of developing nations. The NCGQ is thus, termed the "most important climate goal".
- It pulls up the ceiling on commitment from developed countries, is supposed to anchor the evolving needs and priorities of developing countries based on scientific evidence and should respond to the ever-increasing sums of funding necessary for Loss and Damage in response to failed and/or delayed financial support.

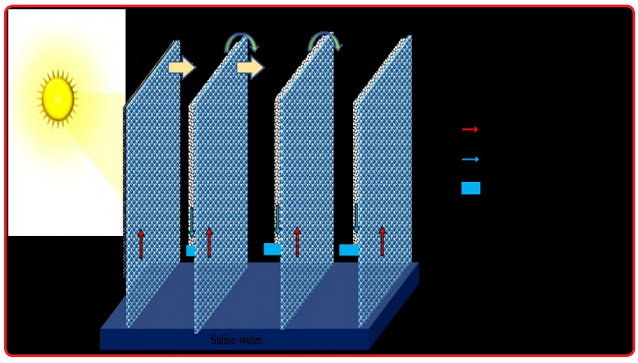
Why do we need a new finance goal?
- Out of the promised $100 billion per year, developed countries provided $83.3 billion in 2020, as per a report by the Organisation for Economic Co-operation and Development.
- These figures may be misleading and inflated by as much as 225%, an Oxfam analysis found, as "there is too much dishonest and shady reporting".
- Moreover, the $100 billion target set in 2009 was seen more as a political goal, since there was no effort to clarify the definition or source of 'climate finance'.
- The economic growth of developed countries has come at the cost of high carbon emissions, and thus they are obligated to shoulder greater responsibility. While funds available for climate finance have quantitatively increased, they are inaccessible, privately sourced, delayed and not reaching countries in need.

What is at stake in 2023?
- Countries are on a tight deadline to agree upon the NCQG ahead of 2024. A global transition to a low-carbon economy requires investments of at least $4 trillion to $6 trillion a year, as per last year's Sharm el-Sheikh Implementation Plan.

- It is argued that instead of identifying a single aggregate figure, the NCQG could also set separate targets (or sub-goals) for focus areas such as mitigation, adaptation and loss and damage.
- The aim is to focus on scaling up concessional financing, stopping debt creation and allowing NCQG to be more of a "process" rather than a goal towards equitable and people-led transition.

SCIENCE & TECHNOLOGY

INDIAN RESEARCHERS DEVELOP NEW SYSTEM TO PURIFY WATER



Why in news?

- As the world faces the growing challenge emerging from water scarcity, a new system developed by researchers from the Indian Institute of Science (IISc) could help increase water availability.
- The innovative thermal desalination system operates using solar energy and could potentially increase the availability of clean, drinkable water in areas facing water shortages.

Thermal desalination:

- Thermal desalination is a unique process used to clean water that involves removing salt and other impurities from water by using heat to evaporate the water and then condensing the resulting vapor to obtain fresh water.
- The heat can be generated using various energy sources such as electricity, fossil fuels, or renewable energy like solar power.

Key features:

- They developed a design for a solar-powered desalination unit that is more energy-efficient, cost-effective, and portable.
- It uses the same working design as solar stills in which solar energy is employed to evaporate saltwater in large reservoirs and the vapour that condenses on a transparent roof is collected.
- The new system is convenient to set up in areas with limited access to continuous electricity and is composed of a reservoir of saline water, an evaporator, and a condenser enclosed within an insulating chamber to avoid heat losses to the ambient air.

How it works?

- Solar thermal energy evaporates a small volume of water wicked into the evaporator, which features a textured surface. The capillary effect of microscale textures enables the liquid to be drawn into narrow spaces of the evaporator, improving the system's energy efficiency.
- To prevent the formation of a water film during condensation, they designed a condenser with alternating hydrophilic and superhydrophobic surfaces.
- The system is designed to trap and utilize the heat released during condensation, further reducing the amount of solar energy required. This heat is used to warm up the saltwater in a separate evaporator located behind the condenser, enhancing the system's efficiency.
- They designed the system in a way that it can be adjusted to align with the sun's shifting positions during the day, and it can effectively desalinate seawater, groundwater with dissolved salts, and brackish water.

Way Forward:

- The team is focused on scaling up the system, improving its durability, and incrasing the volume of drinking water produced.

SFC CARRIES OUT SUCCESSFUL TRAINING LAUNCH OF AGNI 1 BALLISTIC MISSILE

Why in news?

- India recently carried out a successful training launch of the Agni-1 ballistic missile that validated all operational and technical parameters of the strategic weapon.
- The Strategic Forces Command (SFC) carried out the missile launch from APJ Abdul Kalam Island in Odisha.

Outcome:

- The missile is a proven system, capable of striking targets with a very high degree of precision.
- The user training launch successfully validated all operational and technical parameters of the missile.

Agni series:

- In the last two decades, India has been focusing on enhancing its strategic deterrent capability by developing various ballistic missiles, precision-guided munitions and related platforms.
- India has developed various variants of the Agni series of missiles.
- In December 2022, India successfully test-fired nuclear-capable ballistic missile Agni-V that can strike targets at ranges up to 5,000 km.
- The Agni 1 to 4 missiles have ranges from 700 km to 3,500 km and they have already been deployed.
- In April, India successfully carried out the maiden flight trial of an endo-atmospheric interceptor missile from a ship off the coast of Odisha in the Bay of Bengal as part of its ambitious ballistic missile defence programme.

Significance:

- The purpose of the trial of the sea-based missile was to engage and neutralize a hostile ballistic missile threat, thereby elevating India into an elite club of nations having such a capability.
- The BMDs are capable of intercepting incoming long-range nuclear missiles and hostile aircraft including AWACS (airborne warning and control systems).
- India has been developing capabilities to intercept hostile ballistic missiles both inside and outside the earth's atmospheric limits.

UNDERSTANDING THE KAVACH SYSTEM

Why in news?

- The death of over 288 passengers in the ghastly train accident on June 2 at Bahanaga Bazaar railway station in the Balasore district of Odisha has brought into sharp focus the safety mechanisms needed to prevent such tragedies.

What is Kavach?

- The KAVACH is an indigenously developed by the Research Design and Standards Organisation (RDSO) in collaboration with the Indian industry. The trials were facilitated by the South Central Railway to achieve safety in train operations across Indian Railways.
- It is a state-of-the-art electronic system with Safety Integrity Level-4 (SIL-4) standards. It is meant to provide protection by preventing trains to pass the signal at Red (which marks danger) and avoid collision.
- It activates the train's braking system automatically if the driver fails to control the train as per speed restrictions. In addition, it prevents the collision between two locomotives equipped with functional Kavach systems.
- The system also relays SoS messages during emergency situations. An added feature is the centralised live monitoring of train movements through the Network Monitor System.
- 'Kavach' is one of the cheapest, SIL-4 certified technologies where the probability of error is 1 in 10,000 years.

How does Kavach work on Railway Systems?

- The Traffic collision avoidance system (TCAS), with the help of equipment on board the locomotive and transmission towers at stations connected with Radio Frequency Identification (RFID) tags, helps in two-way communication between the station master and loco-pilot to convey any emergency message.
- The instrument panel inside the cabin helps the loco-pilot know about the signal in advance without visual sighting, and the permissible speeds to be maintained.
- If a red signal is jumped and two trains come face to face on the same line, the technology automatically takes over and applies sudden brakes. Additionally, the hooter activates by itself when approaching a level crossing which serves as a big boon to loco-pilots during fog conditions when visibility is low.

Where has Kavach been implemented?

- The Union Railway Minister inspected the trial of the Kavach working system between Gullaguda-Chitgidda Railway stations on Lingampalli-Vikarabad section in the Secunderabad Division of South Central Railway last March.
- The South Central Railway (SCR) Zone is a pioneer in the implementation of the KAVACH – (TACS). The Kavach system has been deployed over 1,465 kms in the SCR limits in 77 locomotives and 135 stations till March this year.
- Additionally, the Secunderabad-based Indian Railways Institute of Signal Engineering & Telecommunications (IRISET) hosts the 'Centre of Excellence' for Kavach.
- IRISET has been mandated by the Railway Board to train the in service railway staff on Kavach. The Institute's Kavach lab carries out round the year training programmes.

What is the Kavach deployment strategy?

- Kavach implementation is being taken up in a focused manner by the Railway Board. The first priority are

the High Density Routes and the New Delhi-Mumbai and New Delhi-Howrah Sections, as they have higher chances of accidents because the trains run closer to each other.

- The second priority lines are the Highly Used Networks, the third ones are other Passenger High Density Routes and the final priority is of course to cover all other routes.
- The RDSO has approved three firms; Medha Servo Drives, HBL and Kernex for providing Kavach equipment with two more being in the pipeline.
- Glitches about vulnerability of a vehicle crossing a closed level crossing, stray cattle or boulders on track, radio communication issues in tunnels, ghat sections, have been tackled.

WHY DOES NORTH KOREA WANT SPY SATELLITES?

Why in news?

- Recently, a North Korean military reconnaissance satellite Malligyong-1 was launched through a new type of rocket named Chollima-1. The satellite is said to have flown for about 10 minutes before crashing into the Yellow Sea.
- The launch was reported failure as the instability in the rocket's engine and fuel system. The launch, however, prompted evacuation warnings and emergency alerts in parts of South Korea and Japan. The U.S., Japan and South Korea expressed 'strong condemnation' to the launch.

What is N. Korea's space programme?

- North Korea in the past decade has had an active space program that is closely related to its missile program. Satellite launch vehicles use the same core technology as long-range missiles that deliver warheads capable of destroying intercontinental targets, (the Intercontinental Ballistic Missiles or ICBMs).
- Starting from 1998, North Korea successfully orbited its first satellite in 2012 after three failed attempts. The launch vehicle used was Unha-3, a likely variant of Taepodong-2 ICBM. The Unha-type launch vehicle was also used in the 2016 launch of Pyongyang's Earth Observation satellite.
- The recent flight was the sixth satellite launch by Pyongyang. It was done through the Chollima-1 which is a new space launcher known to have an engine that is similar to North Korea's dual-nozzle liquid-fuel machine used in Hwasong-15 ICBM.
- Additionally, in April, North Korea announced that it had completed the construction of its first spy satellite.

Why does it want assets in space?

- The North Korean spy satellites are expected to play a crucial role in providing advanced surveillance technology that covers a large portion of the region, to improve the ability to strike targets during conflict.
- Moreover, North Korea's space programme is a response to other strategic developments in the region.
- Earlier, the U.S. announced that it would be activating U.S. Space Forces Korea. This system would provide South Korea with advanced capabilities of missile warning and satellite communications throughout the Korean peninsula and its proximate areas.
- In May, South Korea successfully launched its Nuri rocket that is designed to assist Seoul's efforts to develop a space-based surveillance system. These developments nudged Pyongyang to hasten the launch of Malligyong-1.

What does this mean for East Asia?

- The security anxiety in East Asia in response to the North Korean satellite launch reveals a sense of urgency among the regional powers. North Korea no longer needs to develop its long-range missile technology under the guise of satellites since its test-firing in 2017.
- Pyongyang seems unafraid to reveal its technological intentions and strengthen its security apparatus in the region. While the launch is a breach of the UN Security Council resolutions, it is unlikely to attract additional economic sanctions. This displays the weak effectiveness of sanctions imposed on North Korea.
- Additionally, while the international responses to the launch were largely focused on the missile technology, the possibility of a successful set of four to five military satellites by Pyongyang in-orbit would provide North Korea's military the surveillance capacity that covers the region, strengthening its missile-launch capabilities.

HOW RESEARCHERS USED AI TO FIND AN ANTIBIOTIC AGAINST A SUPERBUG

Why in news?

- In a major breakthrough for the use of Artificial Intelligence (AI) in the field of medicine, scientists from the United States and Canada have found a new antibiotic to kill superbugs using AI.

- Superbugs are bacteria that are resistant to several types of antibiotics.
- Each year these drug-resistant bacteria infect more than 2 million people in the US and kill at least 23,000, according to the US Centers for Disease Control and Prevention (CDC).

What is Acinetobacter baumannii?

- In 2017, the bacterium was identified by the World Health Organization (WHO) as one of the world's most dangerous antibiotic-resistant bacteria.
- Notoriously difficult to eradicate, A. baumannii can cause pneumonia, meningitis and infect wounds, all of which can lead to death.
- The WHO's list of superbugs highlighted bacteria that are having built-in abilities to find new ways to resist treatment and can pass along genetic material that allows other bacteria to become drug-resistant as well.

How do bacteria become resistant to drugs?

- Antibiotics are medicines used to prevent and treat bacterial infections. Antibiotic resistance occurs when bacteria change in response to the use of these medicines, says the WHO. This ultimately threatens the ability of medicines to treat common infectious diseases.
- The WHO lists infections such as pneumonia, tuberculosis, and foodborne diseases as becoming harder to treat with existing medication due to increasing anti-bacterial resistance.

How did researchers use AI in this case?

- Narrowing down the right antibacterial chemicals against bacteria can be a long, difficult process. This is where algorithms come in because the concept of AI is based on the process of machines being given large amounts of data and training themselves on identifying patterns and solutions based on them.
- According to MIT, the researchers first exposed A. baumannii grown in a lab dish to about 7,500 different chemical compounds, to see which ones could help pause the growth of the bacterium.
- Then they fed the structure of each molecule into the machine-learning model. They also told the model whether each structure could prevent bacterial growth or not. This allowed the algorithm to learn chemical features associated with growth inhibition.

Outcome:

- Once the model was trained, the researchers used it to analyse a set of 6,680 compounds. This analysis took less than two hours and yielded a few hundred results. Of these, the researchers chose 240 to test experimentally in the lab, focusing on compounds with structures that were different from those of existing antibiotics.
- Those tests yielded nine antibiotics, including one that was very potent and effective at killing A. baumannii. This has been named abaucin.

SCIENTISTS FIND 'LOST WORLD' IN BILLION-YEAR-OLD AUSTRALIAN ROCK

Why in news?

- Scientists have discovered a lost world that could unravel the story of the evolution of life on the planet.
- These ancient organisms inhabited the underwater world over 1.6 billion years ago and are the source of the evolution of life on Earth.

Protosterol Biota:

- The researchers from the Australian National University stated that Eukaryotic life appears to have flourished surprisingly late in the history of our planet. According to the researchers, these organisms could have been the first predators on Earth.
- Protosterol Biota, the microscopic organism, belongs to the family of organisms called eukaryotes that have a complex structure combining mitochondria, known as the "powerhouse" of the cell, and a nucleus that acts as the "control and information center".
- These remains, date to a time span during what is called the Proterozoic Eon that was crucial in the evolution of complex life but has been shrouded in mystery because of a spotty fossil record of the microscopic organisms that inhabited Earth's marine realm.
- Eukaryotes are still found on Earth in the form of fungi, plants, animals, and single-celled organisms such as amoebae. Researchers said that humans and all other nucleated creatures can trace their ancestral

lineage back to the Last Eukaryotic Common Ancestor (LECA) about 1.2 billion years ago.

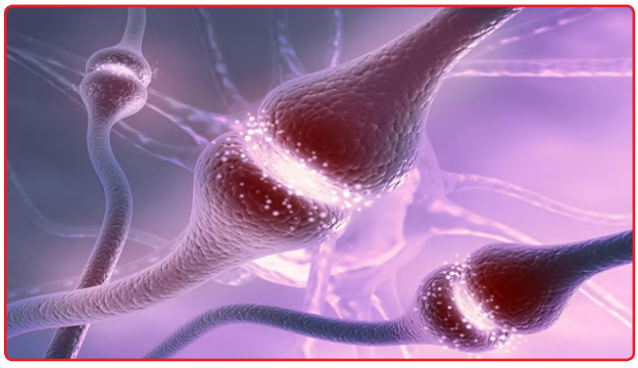
Key findings:

- Molecular remains of the Protosterol Biota detected in 1.6-billion-year-old rocks appear to be the oldest remnants of our own lineage - they lived even before LECA.
- The newly identified fossils are of a rudimentary form of a steroid - a fat molecule that was an indispensable ingredient in cell membranes of pioneering members of a domain of now-dominant organisms called eukaryotes.
- They were gate-crashers in a world teeming with bacteria, simpler unicellular organisms lacking a nucleus.
- Since modern eukaryotes are extremely powerful, it was believed that they should have conquered the ancient oceans on Earth more than a billion years ago and scientists have long searched for the fossilised evidence of these early eukaryotes, but their physical remains are extremely scarce.

Primitive eukaryotes:

- Their disappearance paved the way for modern eukaryotic forms to spread around 800 million years ago.
- To put these time intervals in perspective, our eukaryotic species, Homo sapiens, arose roughly 300,000 years ago.
- Scientists were long puzzled about the seeming absence of molecular fossils from this time span indicative of primitive eukaryotes.

UNESCO TO DEVELOP ETHICAL FRAMEWORK ON NEUROTECH DEVICES



Why in news?

- The United Nations Educational, Scientific and Cultural Organization (UNESCO) is all set to host an international conference to develop an ethical framework for the usage of neurotech devices that feed brain-wave data to computers through dry electrodes and implants.
- The first-of-its-kind conference hosted by the UN body will be held at UNESCO headquarters in Paris, France.
- The dialogue will invite senior officials, policymakers, academics, civil society organisations and the private sector to address concerns regarding individual freedom of thought and privacy.

Agenda:

- The 193 member states of the executive board approved proposal to discuss solutions to neurological problems with the help of neurotechnology while simultaneously assessing the threats it poses to human rights and fundamental freedoms.
- There is an urgent need to establish a common ethical framework at the international level, as UNESCO has done for artificial intelligence.
- The conference aims to lay the foundation for a global ethical framework. It will be guided by a report by UNESCO's International Bioethics Committee on the "Ethical Issues of Neurotechnology".

DBS:

- Deep brain stimulation (DBS) is approved to treat a number of conditions, such as Parkinson's disease, essential tremor, dystonia, epilepsy and obsessive-compulsive disorder," the report stated.
- DBS is also being studied as a potential treatment for major depression, traumatic brain injury, stroke recovery, addiction, chronic pain, cluster headache, dementia, Tourette syndrome, Huntington's disease and multiple sclerosis.
- The document cautioned that the "possible side effects of DBS are frequently underestimated.
- Complications of DBS fall into three categories: Surgery complications, hardware (device and wires) complications and stimulation-related complications."
- Manic psychosis, hypersexuality, pathological gambling and mood swings are associated with dopaminergic treatments of some advanced Parkinson's disease, and there have been reports that these are made worse by DBS.
- UNESCO strives to develop a framework similar to the established global ethical frameworks on the human genome (1997), human genetic data (2003) and artificial intelligence (2021).

Risks posed by AI tech:

- UNESCO acknowledged "the pervasiveness of AI technologies and the risks they pose to people, democracies and jobs. The convergence of neural data and artificial intelligence poses particular challenges, as already recognised in UNESCO's AI standard.
- The dialogue will also be guided by a yet-to-be-released UNESCO study that documents evidence on the neurotechnology landscape, trends and innovations.

Way Forward:

- The new regulations be developed over neurotechnology usage in fields other than medicine.

This is particularly in the areas of well-being, marketing and workplaces.

HOW ISRO CHANDRAYAAN-3 IS IT DIFFERENT FROM CHANDRAYAAN-2

Why in news?

- The Indian Space Research Organisation (ISRO) is making the final preparations to launch the third edition of its lunar mission, Chandrayaan-3.

Details:

- Chandrayaan-3 mission aims to land a rover on the Moon. Isro is currently in the process of integrating the Chandrayaan-3 spacecraft with the GSLV-MkIII rocket that will carry it to the Moon.
- The third edition of the lunar mission comes around four years after the partial failure of the Chandrayaan-2 mission, which crash-landed on the surface of the Moon in 2019.

Key Difference:

Payloads:

- While Chandrayaan-2 comprised of Vikram lander, Pragyan rover, and an orbiter, Chandrayaan-3 will launch with just a lander and a rover.
- It will use the Orbiter already hovering above the Moon launched with Chandrayaan-2 for its communications and terrain mapping requirements.

Visible changes:

- ISRO has also introduced some other visible changes in the Chandrayaan-3 mission, after its learnings from the loss of Chandrayaan-2.
- The new mission is being launched with Lander Hazard Detection & Avoidance Cameras that will be used to coordinate with the Orbiter and the mission control as the lander makes its descent approach to the surface of the Moon.
- While Chandryaan-2 had just one such camera, Chandrayaan-3 has been fitted with two such cameras.

In-situ instruments:

- The Chandrayaan-2 Orbiter was launched with an impressive list of nine in-situ instruments that are still operating in the Moon's orbit.
- In comparison, the propulsion module of the Chandrayaan-3 mission will have just a single instrument named Spectro-polarimetry of HAbitable Planet Earth (SHAPE), which will analyse the spectrum of Earth to generate data for habitable planets.
- The data will be used to study exoplanets and create a standard to recognise the habitability of the exoplanets found outside the Solar System.

LRA:

- Another addition to the Chandrayaan-3 mission is the Laser Retroreflector Array (LRA) being sent with the lander, which is a passive experiment to understand the dynamics of the Moon system.
- The other three payloads being launched with the mission are the same as that of the Vikram lander on Chandrayaan-2.

Way Forward:

- ISRO is planning to launch the Chandrayaan-3 moon mission in the middle of July.

SCIENTISTS FIND A SOLAR ERUPTION THAT HAS MAINTAINED ITS TEMP FOR SIX YRS

Why in news?

- Scientists in India found that a solar eruption that occurred in July 2017 has maintained its temperature for nearly six years, reported the Ministry of Science and Technology.
- Scientists have been tracking the continuous evolution of the energy state of the core of a solar eruption that occurred on July 20, 2017. They found that it had maintained a constant temperature.

How CMEs can disrupt the range of satellites and other technology on Earth?

- Coronal mass ejections (CMEs) are large-scale eruptions of charged particles (plasma) and magnetic fields from the solar atmosphere into space.
- CMEs have potential destructive properties as they have their own magnetic field and can disrupt earth's magnetic field. It has also been known to cause electrical blackouts and disrupt radio transmissions.
- When the sun releases CMEs, charged particles, and magnetic fields are thrown into space.

- CMEs contain plasma at different temperatures, ranging from cold to extremely hot. As CMEs move, various processes can either heat up or cool down the plasma by exchanging different forms of energy.
- To understand these processes, scientists study the changes in properties like density, temperature, and thermal pressure of CMEs. This knowledge is crucial for monitoring space weather and its consequences on Earth.
- However, as CMEs evolve closer to the sun, within 3 times the sun's radius, observations in these regions have been limited.

What did the scientists find?

- The team of scientists from Aryabhatta Research Institute of Observational Sciences (ARIES), Nainital and Southwest Research Institute, Boulder, USA tracked were part of the team tracking the CME.
- They observed that despite the core expanding, which would usually cause cooling, the temperature remained constant as it moved from 1.05 to 1.35 times the radius of the sun. They used data from ground-based and space-based instruments to support these findings.
- Additionally, they observed that the density of the core decreased by about 3.6 times as it moved outward.
- Based on their observations, the scientists concluded that the expansion of the core behaved more like an isothermal process (constant temperature) rather than an adiabatic process (where heat exchange occurs).

Future prospects:

- In the future, India's Aditya-L1 mission, equipped with the visible emission line coronagraph (VELC), will provide more data about CMEs in the inner corona. Analysing this data will offer new insights into the evolution of CME properties in that region.
- A similar kind of analysis using VELC data will provide new insights of the evolution of CME thermodynamic properties in the inner corona.

SCIENTISTS DEVELOP 2 NEW POLIO VACCINES TO HELP ERADICATE VIRAL DISEASE

Why in news?

- Scientists have developed two novel oral polio vaccines (nOPVs) that will bolster the World Health Organization's most recent push to finally eradicate the viral disease.
- The two nOPVs are made from weakened poliovirus that has been genetically engineered to reduce reversion to dangerous forms of the virus.

About Polio

- Polio is usually asymptomatic, but can cause severe disability, paralysis or death in about one in every hundred children.
- It spreads via fecal or oral particles, so it is particularly problematic in regions with poor sanitation.
- The first effective polio vaccines emerged in the 1950s, kicking off massive campaigns to immunise every person, with an emphasis on children.

Wildtype:

- While the original, or wildtype, poliovirus has only been recently detected in Afghanistan and Pakistan, vaccine-derived polio has been detected in countries as far flung as Syria, the Democratic Republic of Congo, and the US.
- There have been more cases of vaccine-derived polio than wildtype in recent years, creating an urgency to counter this new source of polio.

nOPV2 vaccine:

- The nOPV2 vaccine developed by the team earned the WHO's first-ever emergency use listing in 2020 and was quickly manufactured and distributed.
- Despite its effectiveness, nOPV2 only protects against one of three strains of polio, and cases of polio have recently emerged in Israel, which is heavily vaccinated, as well as in pockets of the US where people refuse to vaccinate their kids.

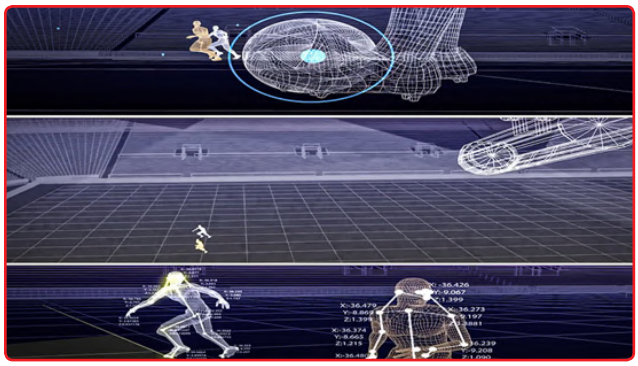
New vaccines:

- The latest work from Andino's group takes the solution they crafted for nOPV2the three mutations that usually prevent the vaccine from becoming dangerous over timeand engineers it into the other two types of OPV.
- The resulting vaccines, nOPV1 and nOPV3, effectively prevented polio in animal models. All three are much safer than the original OPVs, which can occasionally cause paralysis in those who get the vaccine, although this is rare.

Way Forward:

- The two new vaccines are currently being tested in clinical trials to ensure that they are both effective and do not revert to dangerous forms in humans.
- Andino is hopeful they will be incorporated into bivalent or trivalent combinations with nOPV2.

NEW MODEL FOR IMPROVING HIGH FREQUENCY RADIO COMMUNICATIONS, CRUCIAL DURING NATURAL DISASTERS



Why in news?

- A new model for radio wave propagation through the ionosphere developed by scientists can help estimate the impact of space weather and facilitate the planning and operation of High Frequency (HF) radio communications, a vital means of communication during the situations like natural disasters, and mid-ocean surveillance.

Skywave communications:

- The ionosphere is a region of Earth's upper atmosphere ranging from about 100 - 1000 km and acts as a gateway for radio communication between the ground and space.
- Radio waves of certain frequencies (HF band) are reflected back to the ground by the ionosphere which facilitates long-distance HF communications beyond the horizon, known as Skywave communications.

Disturbance:

- Despite the increasing use of satellite communications, traditional long-distance high-frequency (HF) radio communication, remains a vital means of communication during the situations like natural disasters, mid-ocean surveillance, over-the-horizon target detection, and so on.
- Severe ionospheric disturbances that arise due to a range of space weather events like Solar flares, Coronal Mass Ejections (CMEs), and Geomagnetic storms significantly affect Skywave communications.
- This variability of ionosphere due to disturbances in space weather can significantly limit the usage of Skywave communications.

New model:

- Scientists of the Indian Institute of Geomagnetism (IIG), have recently developed a model for HF radio wave propagation through the ionosphere which helps in studying the impacts of space weather effects on the ionosphere and Skywave communication systems.
- They have found a deep depletion of the ionosphere over the low latitudes of the Indian sub-continent region due to a severe geomagnetic storm in March 2015.
- The model indicates that this ionospheric depletion can severely limit the usable HF spectrum by more than 50% for Skywave communication during this disturbed period.
- Also, the skip-zones where the Skywave signals are not receivable are expanded for very large areas resulting in the loss of communications. This information is crucial for developing robust strategies in mitigating the space effects on Skywave communication systems.

Way Forward:

- This model has important applications in planning the right strategies for the operation of Skywave communication systems during active space weather periods.
- The development of such strategies is essential for ensuring reliable Skywave communication systems in the face of natural disasters and other emergencies.

WHAT'S THE INDIA, U.S. INITIATIVE ON FUTURE TECH?

Why in news?

- Recently, India and the United States unveiled a roadmap for enhanced collaboration in high-technology areas, with a focus on addressing regulatory barriers and aligning export controls for smoother trade and "deeper cooperation" in critical areas.
- This was part of the Initiative on Critical and Emerging Technology (iCET) announced by US President and Indian in 2022.
- India's National Security Adviser (NSA) and his American counterpart reviewed the progress of the initiative at the second track 1.5 dialogue on iCET.

What is iCET?

- The Initiative on Critical and Emerging Technologies is a framework agreed upon by India and the U.S. for cooperation on critical and emerging technologies in areas including artificial intelligence,

quantum computing, semiconductors and wireless telecommunication.

- It was launched in January 2023 to strengthen their strategic partnership and drive technology and defence cooperation.
- Both leaders first announced the framework on the sidelines of the Quad meeting in Tokyo in May 2022.

What are the focus areas of the initiative?

- Primarily, the iCET seeks to position both nations as "trusted technology partners" to build supply chains and support the co-production and co-development of items.
- Key takeaways include setting up a research agency partnership to drive collaboration in areas like AI;
  - developing a new defence industrial cooperation roadmap to accelerate technological cooperation for joint development and production;
  - developing common standards in AI;
  - developing a roadmap to accelerate defence technological cooperation and 'innovation bridge' to connect defence startups;
  - supporting the development of a semiconductor ecosystem;
  - strengthening cooperation on human spaceflight;
  - advancing cooperation on development in 5G and 6G; and
  - adopting OpenRAN network technology in India.

What has been the progress so far?

- India and the U.S. have made "significant progress" in several key areas identified for collaboration since the launch of iCET.
- The two countries have already put in place the Quantum Coordination Mechanism, launched a public-private dialogue (PDD) on telecommunication to drive collaboration in OpenRAN, 5G and 6G, and held "important exchanges" on AI and space.
- In March, India and the U.S. signed an MoU on establishing a semiconductor supply chain that paved the way for creating a semiconductor sub-committee to review recommendations from an industry-led task force launched in connection with the iCET.
- India and the U.S. have also concluded a roadmap for 'Defence Industrial Cooperation' to guide the policy direction for the next few years.
- Both countries have also established a Strategic Trade Dialogue to remove regulatory "barriers" and review existing export control norms to take forward strategic technology and trade collaborations envisaged under iCET.

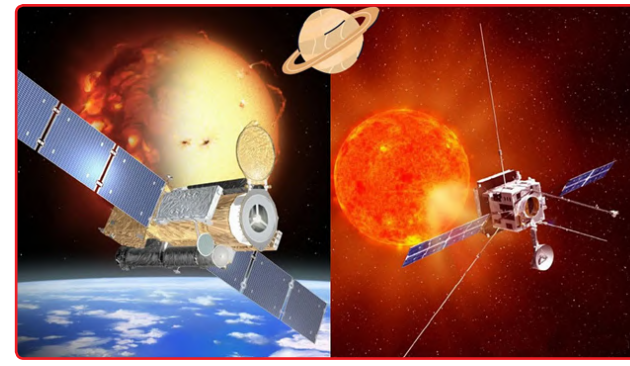
Upcoming deals:

- On the defence front, the two countries are close to concluding a mega jet engine deal, with a final announcement expected during Indian PM's visit to U.S.
- In addition, a new initiative to advance cutting-edge technology cooperation, known as the India-U.S. Defence Acceleration Ecosystem (INDUS-X), is set to be launched during the visit.

Way Forward:

- Both the NSAs express optimism that the initiative will achieve more specific and tangible results in the near future.

SUIT, THE UNIQUE TELESCOPE TO LAUNCH WITH ADITYA L-1 MISSION



Why in news?

- Pune's Inter-University Center for Astronomy and Astrophysics (IUCAA) has delivered the Solar Ultraviolet Imaging Telescope (SUIT) to the Indian Space Research Organisation (ISRO).
- Suit will be launched onboard India's maiden mission to explore the Sun, Aditya L-1.
- It is one of the seven instruments being launched outside Earth with the mission to unravel the secrets of the Sun.

What is SUIT?

- The SUIT, designed by scientists at IUCAA, will study the Sun's ultraviolet (UV) emissions and capture high-resolution images of the Sun's atmosphere, known as the corona, in various UV wavelengths.
- The Sun is one of the most difficult things to study outside Earth due to its high emissions and radiation. With Aditya L-1, India wants to change that and see the star in our Solar System in a new light.
- SUIT will enable scientists to explore the dynamic and complex processes occurring in the Sun's outer layers.

Applications:

- Developed over a span of nearly a decade, SUIT will operate in the far and near ultraviolet regions, covering wavelengths of 200-400 nanometers.
- The instrument will observe the hotter and more dynamic regions of the Sun's atmosphere, such as the transition region and the corona.
- The chromosphere is the layer of the Sun's atmosphere that lies just above the photosphere. The corona is the outermost layer of the Sun's atmosphere.
- Once in space, it will also explore the dynamics of solar flares, sudden, violent outbursts of energy from the Sun.

- ISRO will use SUIT to monitor the Sun's activity and provide early warning of potential solar flares and CMEs, study the interaction between the Sun and the Earth's atmosphere, and try to better understand the role of the Sun in climate change.

VELC:

- ISRO had previously received the Visible Emission Line Coronagraph (VELC) to be integrated with Aditya L-1 mission.
- VELC, developed primarily by IIA, will collect data for solving how the temperature of the corona can reach about a million degrees while the Sun's surface itself stays just over 6,000 degrees Centigrade.
- The corona has so far only been studied during an eclipse when the disk is covered, and Aditya L-1 is aimed at better understanding the mechanism powering the Sun.

What is Aditya L-1 Mission?

- The Aditya L-1 mission is India's maiden mission to observe the Sun and is expected to launch by August this year.
- It will be launched nearly 1.5 million kilometers away from Earth to Lagrange Point 1 (L1), a stable point where the gravitational forces between the Earth and the Sun, as well as the centrifugal force of the rotating system, balance out.
- Out of the seven payloads, while four will directly view the Sun, three others will carry out in-situ studies of particles and fields at the Lagrange point L1.

ASTRONAUTS MAKE CLEAN WATER FROM THEIR OWN URINE IN SPACE

Why in news?

- In a significant breakthrough for space exploration, astronauts aboard the International Space Station have successfully generated water by capturing moisture and distilling urine.
- They achieved this milestone by utilising the Environmental Control and Life Support System (ECLSS) of the space station.

ECLSS System:

- The system is designed to collect wastewater, including moisture released from the crew's breath and sweat, and send it to the Water Processor Assembly (WPA) where drinkable water is produced.
- Additionally, the Urine Processor Assembly (UPA) recovers water from urine through vacuum distillation. However, this distillation process generates urine brine, which still contains some water components.

Brine Processor Assembly (BPA)

- Scientists have been testing a new technology, the Brine Processor Assembly (BPA), to further recover water from the brine. The BPA, a subsystem that extracts wastewater, is being evaluated in a zero-gravity environment.
- It takes the brine produced by the UPA and subjects it to special membrane technology, followed by blowing warm, dry air over the brine to evaporate the water.
- This process creates humid air, which, alongside crew breath and perspiration, is collected by the station's water collection systems.

Advantages:

- This remarkable feat underscores the sophisticated processes and rigorous ground testing employed to ensure the production of clean and potable water in space.
- Water is critical for long-duration space travel due to its multifaceted significance. Firstly, water is essential for the survival and well-being of astronauts. It is required for hydration, food preparation, and personal hygiene.
- Without a constant supply of clean water, the health and performance of the crew could be severely compromised.
- Secondly, water plays a crucial role in sustaining life support systems on spacecraft. It is used for generating breathable oxygen through electrolysis and for regulating temperature and humidity levels.
- Moreover, water serves as a radiation shield, providing protection against harmful cosmic radiation.
- Water is a vital resource for growing plants and conducting experiments in controlled environments, facilitating research and potential food production during extended space missions.

SCIENTISTS FROM GUJARAT INSTITUTE DEVELOP BIODEGRADABLE PAPER SUPERCAPACITOR FROM SEAWEED

Why in news?

- Scientists at Gujarat Energy Research and Management Institute (GERMI) have developed the thinnest, lightweight and biodegradable paper-based supercapacitor.
- This supercapacitor which can fully charge a device within 10 seconds, has been developed from seaweed (marine macroalgae).

What is supercapacitor?

- A supercapacitor is an electrochemical charge storage device with a fast charging/discharging cycle, high power density and a longer lifecycle.

Key Highlights:

- Scientists extracted cellulose nanofibers from seaweed and reduced them into graphene oxide and zinc oxide. Nanowires were grown over the extracted seaweed cellulose nanofibers using hydrothermal methods to get the anodic paper supercapacitor.
- The marine cellulose-based material used in developing the flexible and thinnest paper supercapacitor can be used in almost all smart electronic devices.
- It can also be a source of revenue for coastal communities that cultivate seaweed, an essential commodity for manufacturing the paper supercapacitor.

What are seaweeds?

- Seaweeds are macroalgae attached to rock or other substrata and are found in coastal areas.
- They are classified as chlorophyta (green), rhodophyta (red) and phaeophyta (brown) on the basis of their pigmentation.
- Among them, chlorophyta holds more potential components; carbohydrates, lipids, proteins and bioactive compounds in the cell wall. Green seaweed has a high amount of a particular type of cellulose in its cell wall.

Raw material:

- Cellulose is found to be as most suitable biopolymer material for manufacturing paper-based electrode materials such as paper supercapacitors or batteries for energy storage applications.
- Cellulose itself is an insulating material that requires to be coated with conductive material to make a paper-based energy storage device.
- Green seaweeds were collected from the Porbandar coast of Gujarat.
- The developed seaweed-based electrode is used in an asymmetrical supercapacitor by sandwiching a sodium chloride electrolyte-soaked paper separator between two seaweed cellulose nanocomposites and activated charcoal powder slurry.

Applications:

- The device is of high tensile strength and performance, as well as cost-effective.
- The product can be used in electronics, memory backup systems, airbags, heavy machines, electric vehicles, etc.; hence, it holds a huge business prospect.

INDIA US TO SIGN ARTEMIS ACCORDS

Why in news?

- The Indian Space Research Organisation (ISRO) and the American space agency NASA will sign the Artemis Accords during Prime Minister Narendra Modi's visit to the United States.
- The new agreement aims to boost cooperation between the two countries and explore the domain beyond the boundaries of Earth.

What are the Artemis Accords?

- The Artemis Accords are part of the Artemis program, a mega initiative undertaken by NASA to return humans to the Moon. The program aims to build a permanent presence in the lunar orbit and on the surface, over half a century after the Apollo missions ended.
- The Accords comprise a set of principles governing international cooperation in space exploration. The multilateral arrangement aims to ultimately make humans an interplanetary species as they venture on to Mars.
- The signing means that India and the US will share data, technology, and resources, and work together to ensure the safety and sustainability of lunar exploration.

Member countries:

- As of now, 23 countries, excluding India, have signed the accords. These countries include Australia, Bahrain, Brazil, Canada, Colombia, France, Germany, Israel, Italy, Japan, the Republic of Korea, Luxembourg, Mexico, New Zealand, Poland, Romania, Saudi Arabia, Singapore, Ukraine, United Arab Emirates, United Kingdom, and the United States.

Why is this a big deal for India?

- The agreement between India and the US is significant as it comes on the heels of the Indian space agency

planning to launch the Chandrayaan-3 mission to the Moon.

- The two countries have already been cooperating on lunar missions; however, it has largely remained limited to sharing knowledge. The new accord will ensure resource sharing as well.
- ISRO and NASA are already working on a joint project to study natural hazards, melting sea ice, groundwater supply, and other environmental factors that contribute to the rising pace of climate change across the world.
- The Nasa-ISRO Synthetic Aperture Radar (NISAR) arrived in India earlier this year and will launch on the Geosynchronous Satellite Launch Vehicle Mark II (GSLV-MkII) rocket from Satish Dhawan Space Centre into a near-polar Earth orbit in 2024.

Future Prospects:

- While India and the US have agreed on sending Indian astronauts to the International Space Station, it will still take some time. However, the more immediate benefit will be sharing information on human spaceflight.
- India is in the midst of training its first batch of astronauts for the Gaganyaan mission, and this new cooperation could further help in strengthening the curriculum, facilities, and training designs.
- With NASA planning to launch the first crew of four astronauts into lunar orbit with Artemis-II next year and land humans on the lunar surface by 2025, the signing of the agreement will establish India as a major recipient of information from the mission.

Way Forward:

- The new agreement will push India further into the new world order that is looking beyond the orbit of Earth as it explores the cosmos and continues to find its place in the ever-expanding universe.

JET ENGINE DEAL ENSURES 80% TECHNOLOGY TRANSFER TO HAL; FIRST ENGINE IN THREE YEARS

Why in news?

- A factsheet issued by the US on the bilateral meetings, described the GE proposal to jointly produce the F414 jet engine in India as "groundbreaking", adding that a manufacturing licence agreement has been submitted for Congressional notification.

Details:

- The Memorandum of Understanding (MoU) was signed between GE and HAL to manufacture F414 engines for the Light Combat Aircraft (LCA)-MK2 in India. Except for a small component, the F414-INS6 engine will entirely be manufactured in India.
- The jet engine deal with the U.S. will see 80% technology transfer by General Electric (GE) to Hindustan Aeronautics Limited (HAL).
- This will include critical technologies. The first engine will roll out three years after the contract is ready.

Background:

- A previous 'Engine Development Agreement' in 2012 between GE and HAL for the F414 engine had 58% technology transfer.

Some of the key technologies that would be transferred to India include

- special coatings for corrosion;
- casting, machining and coating for Single Crystal for turbine blades;
- casting, machining and coating of nozzle guide vanes and other hot parts;
- blisk machining;
- forging/power metallurgy discs for turbine;
- machining of thin walled titanium casing; friction inertia welding for fan and after burner;
- Polymer Matrix Composites (PMC) for bypass polymer duct;
- Ceramic Matrix Composites (CMC) for LPNGV,
- flaps;
- laser drilling technology for combustor;
- bottle boring of shafts.

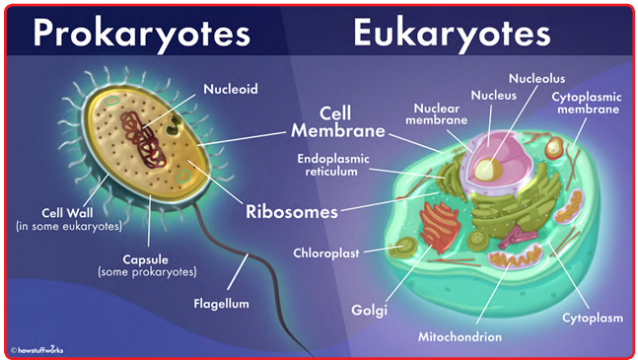
LCA-MK2:

- The F414 will significantly enhance the capability of the LCA-MK2 and engines for prototype and testing are already available.
- The LCA-Mk2 will be 1350mm longer featuring canards and a payload of 6,500 kgs compared with 3,500 kgs for the Mk1 and MK1A.
- Around 120-130 LCA-MK2 jets are likely to be produced.
- The Cabinet Committee on Security (CCS) has already approved the development of the LCA-Mk2 at a total development cost of ₹9,000 crore.

Way Forward:

- The U.S. Congress would have to approve the deal which involves two separate legislations: Export Administration Regulations (EAR) and International Traffic in Arms Regulations (ITAR), and that some of the spadework had been completed during the Strategic Trade Dialogue in June 2023.

HOW PROKARYOTES LED TO EUKARYOTES



Context:

- Organisms on planet earth are broadly divided into prokaryotes and eukaryotes. The former are unicellular, do not have any organelles such as mitochondria, and their DNA is not packaged into a nucleus.
- Eukaryotes have mitochondria, their DNA is packaged into a nucleus, and most of them are complex, multicellular beings.

Archaea:

- About 50 years ago, a subset of unicellular organisms, the Archaea, were shown to have a different line of descent as compared to bacteria. The two differ in the composition of their cell walls, and in the sequence of some of their genes.
- The term Archaea, was used because the first members of this domain were found living in extreme environments of very high temperatures or very high salt.

Asgard-mitochondrial union:

- One group of archaea were shown to have proteins that closely resembled eukaryotic proteins. These organisms are found in a geological formation where geothermally heated water is forced out of a ridge in the Atlantic Ocean floor at a depth of 2400 meters below sea level.
- Many other related members were later found in unusual ecosystems, and came to be collectively called the Asgard, which is the home of the Gods in Norse mythology.
- The mitochondria, which are the energy-generating organelles of eukaryotic cells, and the photosynthesizing chloroplasts found in plant cells, have evolved from free-living bacteria.
- The ancestor of mitochondria was a proteobacteria that was engulfed by an Asgard archaean organism. Descendants of this endosymbiotic union gave rise to animals, fungi and plants.
- In plants, the Asgard-mitochondrial union was followed by the intake of a photosynthesizing cyanobacterium, which became the chloroplast.

Reconfiguring of cellular processes

- Establishing a workable symbiotic relationship between two independent life forms poses many challenges. There was no need to retain two full sets of genes, so choices were made: for Information Technology (cell replication, etc.), archaean genes were retained; for operations and housekeeping (assembling proteins), bacterial genes were preferred.
- Over time, most genes of the organelle were transferred to the nucleus, perhaps a more efficient arrangement.
- The researchers has performed extensive studies on the reconfiguring of cellular processes in these endosymbiotic relationships. They compared animals and fungi with plants, where it is even more complicated as three gene sets were involved in the course of their evolution.

Outcome:

- The paper shows that animals and fungi work their way around this discrepancy by forcing the mitochondria to change.
- Plants segregate the two policing machineries in the cytoplasm and in mitochondria.

U.S. APPROVAL FOR LAB MEAT

Why in news?

- Recently, two California-based companies were cleared to make and sell cell-cultivated chicken, the 'official' name of chicken meat that is grown in a laboratory for human consumption.
- As a concept, it is being hailed by stakeholders as a major step towards reducing carbon emissions associated with the food industry worldwide.

What did the FDA approve?

- The two companies, Good Meat and Upside Foods, have received the U.S. government's approval to make and sell their cell-cultivated chicken. In cases like these, a company in question is required to assess the safety of its own facilities and the veracity of its production process.
- Sometimes, in order to boost consumer and investor confidence, it may consult with the Food and Drug Administration (FDA). At the end of this process, if

the FDA is satisfied by the company's submissions, it will send a "no questions" letter, signalling its tacit approval.

What is cell-cultivated chicken?

- To make cell-cultivated meat, the two companies isolate the cells that make up the meat (and put them in a setting where they have all the resources they need to grow and make more copies of themselves.
- These resources are typically nutrients, fats, carbohydrates, amino acids, the right temperature, etc.
- The 'setting' in which this process transpires is often a bioreactor (also known as a 'cultivator'), a sensor-fit device that has been designed to support a particular biological environment.
- Once there are enough of these cells, which takes around two to three weeks in Upside's process, they resemble a mass of minced meat. They are collected and processed with additives to improve texture.
- Which forms of cell-cultivated meat exist?
- Chicken is the second most widely consumed meat in the world, according to the UN Food and Agriculture Organization (FAO). However, in the U.S. it has been the highest consumed meat since 2010.
- Good Meat and Upside have focused on chicken, and plan to expand their offerings to include other meats in the future.
- Researchers are also developing cell-cultivated versions of sea bass, tuna, and shrimp.

Why was cell-cultivated meat created?

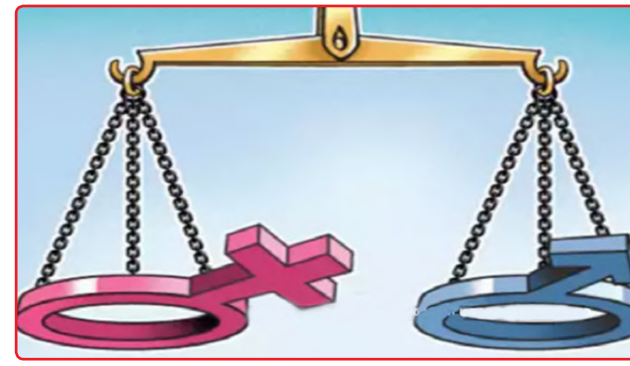
- Its proponents have advanced the following arguments, among others — emissions, land use, prevention of animal cruelty, and food security. The first two are related to climate mitigation.
- The FAO has estimated that global livestock is responsible for 14.5% of all anthropogenic greenhouse-gas emissions. Of this, the production of beef as a commodity accounted for 41% whereas chicken meat and eggs accounted for 8%.
- Similarly, the 2021 report estimated that lab-cultivated meat would use 63% less land in the case of chicken. Alternative meat's proponents have advanced it as a way to meet the world's nutritional security needs.

What are the challenges?

- Consumer Acceptance: Perfectly substituting animal meat with alternative meat requires it to match the original in taste, texture and appearance. Researchers have achieved some success on these counts but it remains a work in progress.
- Cost factor: The cost of cell-cultivated meat is expected to remain high in the near future. One 2020 analysis concluded that it may never be cost-competitive, while reports have also expressed concerns about the costs imposed by quality control, especially at scale.
- High quality cells: For cultivation, researchers require high quality cells, a suitable growth-medium in which the cells can be cultured, plus other resources required to maintain the quality of the final product.
- Risks: The uncertainties associated with it.

SOCIAL ISSUE

INDIA CLIMBS EIGHT PLACES TO 127 IN GLOBAL GENDER INDEX, SAYS WEF REPORT



Why in news?

- India has ranked at 127 out of 146 countries in terms of gender parity, according to the World Economic Forum's annual Gender Gap Report, 2023.
- The World Economic Forum (WEF) ranked India at 135 out of 146 countries in the Global Gender Gap Index in the report's 2022 edition.

Details:

- India has improved by 1.4 percentage points and eight positions since the last edition, marking a partial recovery towards its 2020 parity level.
- India has attained parity in enrolment across all levels of education.
- India has closed 64.3 per cent of the overall gender gap. However, it underlined that India has reached only 36.7 per cent parity on economic participation and opportunity.

Global rankings:

- The index ranked India's neighbours Pakistan at 142, Bangladesh at 59, China at 107, Nepal at 116, Sri Lanka at 115 and Bhutan at 103.
- Iceland is the most gender-equal country in the world for the 14th consecutive year and the only one to have closed more than 90 per cent of its gender gap.

Highlights related to India:

- In India, while there has been uptick in parity in wages and income, the share of women in senior positions and technical roles have dropped slightly since the last edition.

Political empowerment:

- On political empowerment, India has registered 25.3 per cent parity, with women representing 15.1 per cent of parliamentarians, the highest for the country since the inaugural report in 2006.

- Out of the 117 countries with available data since 2017, 18 countries including Bolivia (50.4 per cent), India (44.4 per cent) and France (42.3 per cent) have achieved women's representation of over 40 per cent in local governance.

Sex ratio:

- For India, the 1.9 percentage point improvement in sex ratio at birth has driven up parity after more than a decade of slow progress, the report said.
- However, it also said that for Vietnam, Azerbaijan, India and China, the relatively low overall rankings on the Health and Survival sub-index is explained by skewed sex ratios at birth.

South Asia:

- Overall, the Southern Asian region has achieved 63.4 per cent gender parity, the second-lowest of the eight regions.
- The score in South Asia has risen by 1.1 percentage points since the last edition on the basis of the constant sample of countries covered since 2006. The improvement is partially attributable to the rise in scores of populous countries such as India, Pakistan and Bangladesh.

Overall Gender Gap:

- Overall, the report said gender parity globally has recovered to pre-Covid levels but the pace of change has stagnated as converging crises slow progress. While no country has yet achieved full gender parity, the top nine countries have closed at least 80 per cent of their gap.
- The report found that the overall gender gap has closed by 0.3 percentage point from 2022.
- The overall progress in 2023 is partly due to the improvement in closing the educational attainment gap, with 117 out of the 146 indexed countries now having closed at least 95 per cent of the gap.

About Global Gender Gap Report:

- The Global Gender Gap Report, now in its 17th edition, benchmarks the evolution of gender-based gaps in four areas:
  a) economic participation and opportunity;
  b) educational attainment;
  c) health and survival; and
  d) political empowerment.
- It is the longest-standing index which tracks progress on closing these gaps since its inception in 2006. It also explores the impact of recent global shocks on the gender gap crisis in the labour market.

HEALTH

WHY IS INDIA RETHINKING ITS ANAEMIA POLICY?

Why in news?

- Questions related to anaemia are slated to be dropped from the National Family Health Survey (NFHS-6) scheduled to begin on July 6. The omission comes after health experts questioned the efficacy of the method being used to estimate haemoglobin levels.

- India's anaemia burden has grown alarmingly with NFHS-5 (2019-21) finding that 57% of women in the age group 15-49 and 67% children between six months and 59 months are anaemic (from the corresponding 53% and 58.6% respectively in NFHS-4/2015-16).
- The Health Ministry has noted that anaemia is a public health challenge and accurate estimates are needed to tackle the crisis.

What causes anaemia?

- According to the World Health Organization (WHO), anaemia is a condition in which the number of red blood cells or the haemoglobin concentration within them is lower than normal.
- Haemoglobin is needed to carry oxygen and if there are too few red blood cells, or not enough haemoglobin, there will be a decreased capacity of the blood to carry oxygen to the body's tissues, resulting in symptoms such as fatigue, weakness, dizziness and shortness of breath among others.
- Anaemia, may be caused by several factors. The most common nutritional cause of anaemia is iron deficiency.
- The assessment of anaemia in India is being shifted to the new Diet and Biomarkers Survey in India (DABS-I), launched in 2022 to map diet, nutrition and health status and provide the correct estimate of anaemia among the rural and urban population.

What prompted the change?

- Researchers had cautioned that there is a danger of anaemia being over-diagnosed in India as it follows WHO cut-offs for haemoglobin which may not be suited to India, because the cut-off point depends on the age, gender, physiological status, altitude and other factors.
- The WHO defines anaemia in children aged under five years and pregnant women as a haemoglobin concentration <110 g/L at sea level, and anaemia in non-pregnant women as a haemoglobin concentration <120 g/L.

- The study by the Indian team also pointed to differences in the way blood is drawn for sampling in NFHS.
- The NFHS survey measured haemoglobin in a drop of capillary blood that oozes from a finger prick. This can dilute the blood and give a falsely lower value. The recommended method of venous blood sampling gives a more accurate value.

Will a dietary survey help?

- The Health Ministry says DABS-I is a comprehensive national-level dietary survey, which will define food and nutrient adequacy by collecting individual dietary intake data of different age-groups of people from all States and UTs across the country.
- The study will also provide nutrient composition data on cooked and uncooked foods from various regions of the country for the first time.
- On the other hand, NHFS provides information on population, health, and nutrition for India and each State/UT.
- Besides providing evidence for the effectiveness of ongoing programmes, the data from NFHS helps in identifying the need for new programmes with an area specific focus.

Why the focus on anaemia?

- Data on anaemia remains an important indicator of public health since anaemia is related to morbidity and mortality in the population groups usually considered to be the most vulnerable — pregnant women and children under five.
- A prevalence study on anaemia is useful to monitor the progress of reproductive health. Also, iron-deficiency anaemia reduces the work capacity of individuals and entire populations, with serious consequences for the economy and national development.

INDIAN DRUGS CONTROLLER APPROVES FIRST INDIGENOUSLY DEVELOPED ANIMAL-DERIVED TISSUE ENGINEERING SCAFFOLD

Why in news?

- The first indigenously developed tissue engineering scaffold from mammalian organs, an animal-derived Class D Biomedical Device that can rapidly heal skin wounds at low-cost with minimum scarring, has received approval from the Indian Drugs Controller.

Indigenous technology:

- With this, the Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST) became the first institution in the country to develop Class D medical devices that satisfy all statutory requirements of the Central Drugs Standard Control Organisation, Government of India.
- The concept of using animal-derived materials as advanced wound care products is not new. However, indigenous technology was so far not available for fabricating quality products that satisfy the requirements of the Drugs Controller General. Therefore, such products were imported making them expensive.

How it was prepared?

- Researchers decellularised pig gall bladder and recovered extracellular matrix.
- Membrane forms of the scaffold, identified as Cholederm, healed different types of skin wounds including burn and diabetic wounds in rat, rabbit, or dog faster than similar products currently available in the market with minimal scarring as proved by several in-depth laboratory investigations focusing Type I and Type III collagen.
- They showed that the graft-assisted healing was regulated by anti-inflammatory (pro-regenerative) M2 type of macrophages. Indeed, the scaffold modulated or mitigated the scarring reactions in subcutaneous, skeletal muscle, and cardiac tissues.

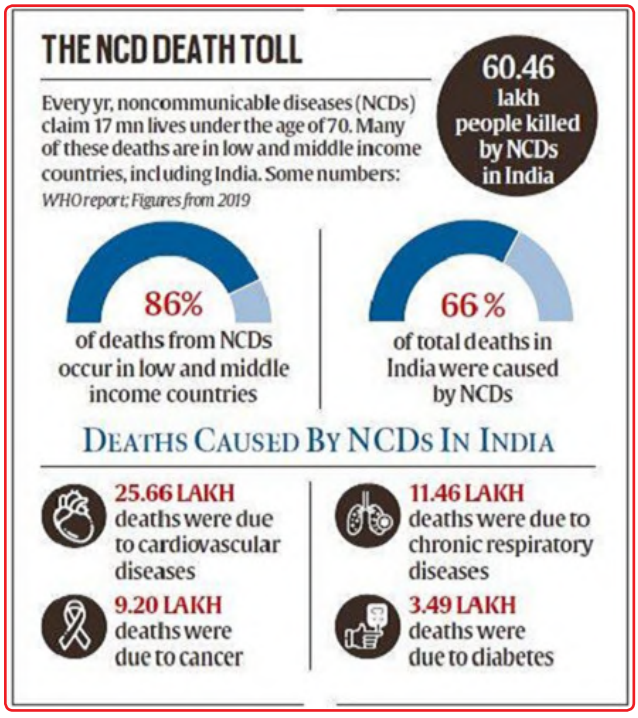
Advantages:

- The scaffold has the ability to mitigate fibrotic scarring in rats suffering an experimental myocardial infarction.
- It is expected that with the introduction of Cholederm to the Indian market, the treatment cost can be reduced from Rs 10,000/- to Rs 2,000/- making it more affordable to the common man.
- Moreover, the technology for recovering extracellular matrix from the gall bladder is not available to others and it gives a fair chance for competition in the international market.
- In addition, the above findings made gall bladder of pigs, normally a slaughterhouse waste without any monetary value, a highly value-added raw material for biopharmaceutical industry thereby creating an additional income-generating opportunity for pig farmers.

What's next?

- However, the application of membrane forms of the scaffold for treating cardiac injury was cumbersome.
- Therefore, the team is developing injectable gel formulations of the scaffold that permits transvenous on-site delivery of the scaffold and for surface modification of polymeric medical devices.

ARE NON COMMUNICABLE DISEASES INCREASING IN INDIA?



Why in news?

- The new national estimates for diabetes and other non-communicable diseases (NCD) shows that 31 million more Indians became diabetic in four years (2019-2021).

What were the findings?

- In 2021, a study found that India has 101 million people with diabetes and 136 million people with prediabetes.
- Additionally, 315 million people had high blood pressure; 254 million had generalised obesity, and 351 million had abdominal obesity.
- 213 million people had hypercholesterolaemia (wherein fat collects in arteries and puts individuals at greater risk of heart attack and strokes) and 185 million had high low-density lipoprotein (LDL) cholesterol.
- The decade-long nationwide study was funded by the Indian Council of Medical Research and Department of Health Research, Ministry of Health and Family Welfare and co-ordinated by the Madras Diabetes Research Foundation.

What is the significance of the study?

- The study is the first comprehensive epidemiological research paper which includes participants from 31 States and some Union Territories, with a large sample size of 1,13,043 individuals. There are two big trend indicators in the study.
- First, diabetes and other metabolic non-communicable diseases, such as hypertension, obesity and dyslipidemia are much more common than estimated previously in India and second, while currently urban regions had higher rates of all metabolic NCDs than rural areas, with the exception of prediabetes, rural India will see a diabetes explosion in the next five years if left unregulated.
- The study also highlights interstate and inter-regional variations. The highest diabetes prevalence was found in Goa, Puducherry and Kerala. While prediabetes was prevalent in Sikkim, hypertension was highest in Punjab.
- Generalised obesity and abdominal obesity were highest in Puducherry, while Kerala had high hypercholesterolemia and high LDL cholestrol. The lowest prevalence of NCDs was found in U.P., Mizoram, Meghalaya and Jharkhand.
- This cross-sectional, population based survey of adults aged above 20 years, across the country uses a stratified, multistage sampling design in the study titled, "Metabolic non-communicable health report of India-the ICMR-INDIAB National Cross-sectional Study."
- While the diabetes epidemic is stabilising in the more developed States of the country, it is still increasing in most of the other States. Thus, there are serious implications for the nation, warranting urgent State-specific policies and interventions to arrest the rapidly rising epidemic of metabolic NCDs in India.

How does this study impact India?

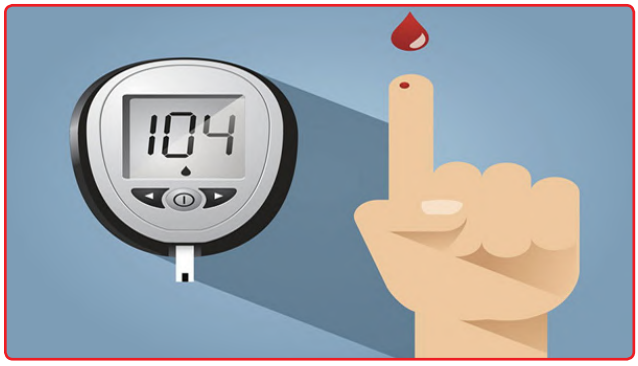
- While India in the past four years has substantially added to its burden of diabetics and hypertensive persons with generalised and abdominal obesity, the study gives an early warning that if not controlled, this population is predisposed to NCDs and life-altering medical conditions including strokes.
- Experts have explained that India is facing the dual problem of malnutrition and obesity. There is availability of surplus food, but after being exposed to fast foods, a lack of sleep, exercise and stress creates a perfect setting for NCDs to latch-on.

What is the way forward?

- The answer to this developing problem, is in wellness and in having a lifestyle that encompasses healthy diet and exercise. NCDs have also been one of the major concerns of the Health Ministry.
- It has identified the four major NCDs; cardiovascular diseases, cancers, chronic respiratory diseases and diabetes. They all share four behavioural risk factors, unhealthy diet, lack of physical activity, and use of tobacco and alcohol.
- Programmes have been brought in to strengthen health infrastructure, human resource development, health-promotion and awareness-generation for

prevention, early diagnosis and ensuring referrals to appropriate healthcare facilities for NCDs.

HOW CAN INDIA TACKLE ITS DIABETES BURDEN?



Why in news?

- Recently, the results of the largest, long-term (2008-2020) study on metabolic factors in the Indian subcontinent as part of the ICMR-InDiab were published.
- It was launched in 2008 to estimate the country's NCD (chronic non-communicable diseases) burden, and done over five phases between 2008 and 2020 across the country, with each phase covering five States (all seven northeastern States were covered in one phase).

What are the key findings?

- It estimated that about 11% of the population is diabetic, and 15.3 % of the country is in the pre-diabetic stage.
- As per these estimates, 101.3 million people in the country are diabetic, and in the pre-diabetes stage, there are another 136 million people. Questions are being raised about whether this constitutes an emergent crisis in India and of the urgent methods that need to be employed to handle this situation, and control possible burgeoning of these numbers in the future.
- According to the World Health Organization (WHO), about 422 million people worldwide have diabetes, and 1.5 million deaths are directly attributed to the disease each year.
- Both the number of cases and the prevalence of diabetes have been increasing, and there is a globally agreed target to halt the rise in diabetes and obesity by 2025.

What are the implications of these statistics?

- The thing with metabolic lifestyle disorders, is that with some attention, it is possible to ward off severe complications and a morbid state of life; it is also possible to ensure that the 136 million at the pre-diabetic stage do not proceed to diabetes.
- There are multiple studies that show that poor control of blood sugar leads to complications — cardiovascular disease, kidney disease, neuropathy, blindness, and lower-extremity amputation — which then become a significant cause of increased morbidity and mortality.
- The question is whether any nation will be equipped to provide comprehensive care to all diabetics who develop complications in the course of living with diabetes.
- While it is sensible to ensure that there are sufficient facilities to treat the complications, the sagacious approach would be to launch public awareness campaigns on using lifestyle modifications to keep blood sugar within acceptable limits and complications at bay.
- Education on a mass scale should be launched across the country for control and periodic check-ups, sticking to the recommended drug regimen and reinforcing health-seeking behaviours.
- Urban India accounts for 16.4% of the prevalence while in the rural population the prevalence is 8.9%. Though the prevalence is lower now, this is an area where the possibility for prevention is greater.

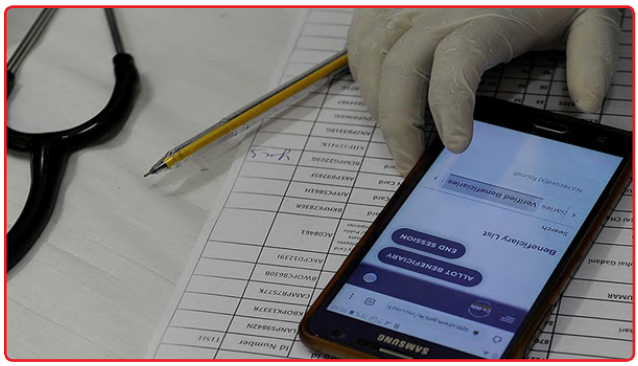
Were there any surprises during the study?

- The impression was that the prevalence was high only in metro cities, Dr. Mohan says, adding that they were quite surprised to find that it was similar, or growing in 2-3 tier cities.
- In Kerala, said to be top among States with better social development indicators, the prevalence in rural areas had escalated to supersede that in urban areas.
- This is a side-effect of progress, one that States should be careful to watch over.
- All the northeastern States were covered in one phase, and the surprises included high prevalence in Tripura and Sikkim.
- While in Tripura, it was averred that the ethnic composition of the State was different from that of the other States in the region, being populated with Bengalis, leading to a high rate of 13% prevalence; in Sikkim where the prevalence of diabetes and pre-diabetes (31 %) was high, it was put down to its smaller size and relatively better socio-economic indicators there.

What is the way forward?

- There is a plan to do a cross-sectional study to gauge the actual incidence in the community.
- Some of the islands and Union Territories that could not be covered during the study will now be included in the study.
- Experts have also indicated tie-ups as part of the public-private partnership mode to involve the larger community in supporting detection and treatment for diabetes.

WHAT DOES THE ALLEGED COWIN DATA LEAK REVEAL?



Why in news?

- Recently, reports emerged that a bot on the messaging platform Telegram was allegedly returning personal data of Indian citizens who registered with the COVID-19 vaccine intelligence network (CoWIN) portal for vaccination purposes.
- The bot shared personal details like name, Aadhaar and passport numbers upon entry of phone numbers. On the same day, the Health Ministry denied reports of a data breach, and said the allegations were "mischievous in nature."
- It added that the Indian Computer Emergency Response Team (CERT-In) was reviewing existing security infrastructure of the portal.

What does the CoWIN portal track?

- CoWIN is a government-owned web portal set up in 2021 to administer and manage India's COVID-19 vaccine rollout.
  - The health register-style platform leverages existing public digital infrastructure like the Electronic Vaccine Intelligence Network (eVIN), an app that provides
  - data on vaccine cold chains in the country;
  - Digital Infrastructure for Verifiable Open Credentialing (DIVOC),
  - a vaccine certificate issuer; and
  - Surveillance and Action for Events Following Vaccination (SAFE-VAC),
  - a vaccine adverse event tracker.
- The platform, on a real-time basis, tracks vaccines and beneficiaries at the national, State, and district levels. It monitors vaccine utilisation and wastage, and maintains an inventory of the vials.
- For citizens, CoWIN verifies identity, helps schedule vaccine appointments, and issues a vaccine certificate.
- The database captures information flowing from four separate input streams; citizen registration; health centres; vaccine inventory; and vaccine certificates. Each stream functions independently, and at the same time exchanges data to minimise redundancies.

Microservice architecture:

- The platform is a microservices-based, cloud-native architecture developed from the ground up on Amazon Web Services (AWS).
- A microservice architecture is a pattern that arranges an application as a collection of loosely linked, fine-grained services. These services interact with each other through certain set protocols.

What is the background to the data breach?

- This is not the first time reports about data leaks have emerged. In January 2022, the personal data of thousands of people in India were reportedly leaked from a government server.
- The information included COVID-19 test results, phone numbers, names and addresses of citizens. The data could be accessed via online search.
- In December, in a separate security breach, an Iranian hacker claimed to be in possession of data from the CoWIN database.

How did the Telegram bot get access to CoWIN-related data?

- Cloud providers like AWS, Microsoft's Azure and Google Cloud typically provide security only for the underlying infrastructure, and not for securing the applications and databases. Customers hosting their data are responsible for what they build in a cloud environment.
- The absence of AWS in CERT-In's vulnerability could mean there was no security lapse at the cloud infrastructure's end.
- While the cloud offers superior security compared to traditional data centres, legacy systems deployed in virtual servers are the weak links in the chain. Such links are a perfect route for hackers to gain entry into a database. This shifts the focus to CoWIN, which was built leveraging legacy software tools. So, an entry point for those behind the bot may have been an old system that was connected to the portal.
- In past data breaches, cybersecurity experts have attributed data leaks to human error or negligence in setting up databases in the cloud.

What is the larger picture?

- Whatever the outcome of the CERT-In probe, the fact remains that sensitive personal data of millions of Indian citizens who signed up for the COVID-19 vaccination is in the hands of cybercriminals.
- It is unclear how they plan to use this information. But such leaks reveal India's unfinished data protection business. A data protection law could be a useful tool in fixing accountability and building safeguards around the use and processing of personal data.
- In 2017, the Supreme Court of India recognised privacy as a fundamental right, highlighting the need to protect personal information.

MEDICINES PATENT POOL DEAL TO MAKE CANCER DRUG CHEAPER

Why in news?

- In a move that will make certain cancer drugs more accessible and cheaper for patients, the Medicines Patent Pool (MPP) has signed sub-licence agreements with the India-based companies Eugia, Hetero and Dr. Reddy's Laboratories, along with the Indonesian firm BrightGene, to make generic versions of the drug Nilotinib of the Switzerland-based pharmaceutical corporation Novartis.

Drug Nilotinib:

- The drug is used for the treatment of chronic myeloid leukaemia, a type of blood cancer.
- Nilotinib is sold under the brand name Tasigna and marketed worldwide by Novartis.

Highlights of MoU:

- The selected manufacturers can make generic versions of Nilotinib in India and seven middle-income countries.
- They can also supply it in 44 territories included in the licence through a non-exclusive licence agreement, subject to local regulatory authorisation.
- The licence includes the opportunity to develop and supply generic versions of Nilotinib in seven middle-income countries.

About Medicines Patent Pool (MPP):

- It is a United Nations-backed group working towards increasing access to, and facilitating the development of, life-saving medicines for low- and middle-income countries.
- MPP was established in 2010 by Unitaid. I.

Mandate:

- MPP's mandate is to accelerate access to affordable quality treatments for people living with HIV, hepatitis C and tuberculosis, as well as HIV-associated co-morbidities.
- Since 2018, MPP has expanded its mandate to other patented essential medicines on the World Health Organization (WHO)'s Model List of Essential Medicines (EML) as well as medicines with strong potential for future inclusion on the EML.
- In 2020, MPP temporarily expanded it's mandate to include COVID-19 treatments.
- In 2021, MPP expanded its mandate into the licensing of technology with an initial focus on COVID-19 vaccines and pandemic preparedness.

PRELIMS FACT

POLITY & GOVERNANCE

OTT PLATFORMS MANDATED TO SHOW ANTI TOBACCO WARNINGS

Why in news?

- On World No-Tobacco Day, Union Health Minister, released OTT guidelines for regulation of online depiction of Tobacco Products in online curated content.
- Publishers of online curated content that display tobacco products or their use will be required to comply with specific guidelines.

World No Tobacco Day 2023:

- World No Tobacco Day is observed on May 31 every year to highlight the risk associated with the use of tobacco.
- The theme of World No Tobacco Day 2023 is "We Need Food, Not Tobacco."

Salient features of new rules issued for Anti-Tobacco warnings on OTT platforms:

Health spots, messages, and disclaimers:

- Publishers of online curated content that display tobacco products or their use will be required to comply with specific guidelines. These include the display of anti-tobacco health spots, lasting a minimum of thirty seconds each at the beginning and middle of the program.
- Furthermore, publishers must exhibit anti-tobacco health warnings as a prominent static message at the bottom of the screen during the display of tobacco products or their use.
- Additionally, an audio-visual disclaimer on the ill-effects of tobacco use, lasting a minimum of twenty seconds each, must be shown at the beginning and middle of the program.

Access to content:

- The health spots, messages, and disclaimers will be made available to the publisher of the online curated content on the website "mohfw.gov.in" or "ntcp.mohfw.gov.in."

Legibility and language:

- The anti-tobacco health warning message displayed as a static message must be legible and readable, with black font on a white background, and must include the warnings "Tobacco causes cancer" or "Tobacco kills."
- Furthermore, the health warning message, health spot, and audio-visual disclaimer should be in the same language as used in the online curated content.

Limitations on display:

- The display of tobacco products or their use in online curated content is prohibited from including the brands of cigarettes or other tobacco products or any form of tobacco product placement.
- Additionally, the display of tobacco products or their use in promotional materials is strictly prohibited.

Compliance:

- The failure to comply with the provisions outlined may result in action taken by an inter-ministerial committee comprising representatives from the Ministry of Health and Family Welfare, Ministry of Information and Broadcasting, and Ministry of Electronics and Information Technology either suo moto, or on receiving a complaint.
- The committee will identify the publisher of the online curated content, issue a notice providing a reasonable opportunity to explain the failure, and require appropriate modifications to the content.

CAG HAD FLAGGED MANY SHORTCOMINGS IN DERAILMENTS REPORT

Context:

- The Comptroller and Auditor-General of India (CAG), in a 2022 report on "Derailments in Indian Railways", had flagged multiple shortcomings and made several recommendations, which included the suggestion to ensure strict adherence to the scheduled timelines for conducting and finalising accident inquiries.

Focus:

- The instances mentioned in the report were those which came to the CAG's attention in the course of the

test audit for the period April 2017 to March 2021, as well as those which had come to its notice in earlier years, but could not be reported in the previous audit reports.

- The focus of the audit was to ascertain whether measures to prevent derailments and collisions were clearly laid down and implemented by the Ministry of Railways.

Key Highlights:

- The auditors found that there were shortfalls ranging from 30% to 100% in inspections by track recording cars and idling of track machines owing to various reasons.
- Itsmain objective was to ascertain the cause of an accident and to formulate proposals for preventing their occurrence.
- In the process it is ascertained if any inherent defect exists in the system of working or in the physical appliances, such as tracks, rolling stock and other working apparatus. Measures for rectifying the defects and irregularities are then proposed based on the findings.

Factor responsible for derailment:

- Analysis of 1,129 'Inquiry Reports' of derailment accidents in 16 Zonal Railways (ZRs) revealed 24 factors responsible for derailments in the selected cases/accidents. The total damages/loss of assets in these cases were reported as ₹32.96 crore.
- While total 422 derailments were attributable to the Engineering Department, the major factor responsible for derailment was related to "maintenance of track" (171 cases), followed by "deviation of track parameters beyond permissible limits" (156 cases).
- In all, 182 derailments were attributable to the Mechanical Department and there were 154 accidents attributable to the loco pilots. "Bad driving/over speeding" was also a key factor.
- The number of accidents attributable to the Operating Department was 275 and "incorrect setting of points and other mistakes in shunting operations" accounted for 84%.
- Of the 1,127 derailments during 2017-21, 289 were linked to track renewals.

INDIA RANKINGS 2023

Why in news?

- Recently, the Union Minister for Education released the India Rankings 2023.
- Which implements the National Institutional Ranking Framework (NIRF) drafted for this purpose by the Ministry of Education in 2015.

NIRF:

- The Ministry of Education started drafting National Institutional Ranking Framework (NIRF) in 2015, which defines multi-dimensional parameters to capture quality and excellence of HEIs in India across various categories and subject domains and rank them based on their cumulative score on these parameters, he added.
- India Rankings serve as a valuable tool for students in identifying universities based on their relative standing in various categories and subject domains among higher educational institutions (HEIs) in the country.
- It has also helped universities in identifying areas for improvement in teaching, research, resources, and infrastructure.

Three distinct additions:

- This is the eighth consecutive edition of India Rankings of HEIs in India. Three distinct additions of 2023 edition of India Rankings are as follows:
  - Introduction of a new subject namely Agriculture & Allied Sectors
  - Integration of "Innovation" ranking previously executed by the Atal Ranking of Institutions on Innovation Achievements (ARIIA) into the India Rankings with an aim to reduce the burden on institutions of providing similar data to two different agencies.
  - Expansion of scope of "Architecture" to "Architecture and Planning" to include institutions imparting courses in Urban and Town Planning.
- With the addition of new category (Innovation) subject domain (Agriculture & Allied Sectors) and expansion of "Architecture" to "Architecture and Planning", the existing portfolio of India Rankings has increased to 13 categories and subject domains that have been ranked in India Rankings 2023.

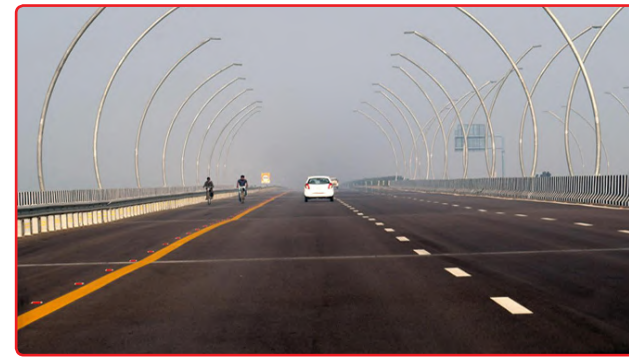
Key Highlights of India Rankings 2023:

- Indian Institute of Technology Madras retains its 1st position in Overall Category for fifth consecutive year, i.e. 2019 to 2023 and in Engineering for eighth consecutive year, , i.e. from 2016 to 2023..
- Top 100 in Overall category consists of 44 CFTIs/ CFUs INI, 24 state universities, 13 deemed universities, 18 private universities, 4 agriculture and allied sector institutions, and 3 management institutions.
- Indian Institute of Science, Bengaluru tops the Universities Category for eighth consecutive years, i.e. from 2016 to 2023. It stood first in Research Institutions Category for the third consecutive year, i.e. from 2021 to 2023.
- IIM Ahmedabad tops in Management subject retaining its first position for fourth consecutive year, i.e. from 2020 to 2023. It was ranked amongst top two in Management subject of the India Rankings from 2016 to 2019.
- All India Institute of Medical Sciences (AIIMS), New Delhi occupies the top slot in Medical for the sixth consecutive year, i.e., from 2018 to 2023. Moreover, AIIMS is ranked at 6th position in Overall category thereby improving from its 9th position in 2022.
- National Institute of Pharmaceutical Education and Research, Hyderabad tops the ranking in Pharmacy for first time pushing Jamia Hamdard to the second slot. Jamia Hamdard was ranked at 1st position for four consecutive years, i.e., from 2019 to 2022.
- Miranda House retains the 1st position amongst Colleges for the seventh consecutive year, i.e., from 2017 to 2023.
- IIT Roorkee stands at 1st position in Architecture subject for third consecutive year, i.e. from 2021 to 2023.
- National Law School of India University, Bengaluru retains its first position in Law for the sixth consecutive year, i.e. from 2018 to 2023
- Colleges in Delhi maintained their dominance in ranking of Colleges with five colleges out of first 10 colleges from Delhi.
- The Saveetha Institute of Medical and Technical Sciences takes the top slot for the second consecutive year.
- Indian Agricultural Research Institute, New Delhi takes the top slot in Agriculture and Allied Sectors.
- Indian Institute of Technology Kanpur tops in Innovation category.

U.P. PLANS TO CREATE STATE CAPITAL REGION ON THE LINES OF NCR

Why in news?

- The Uttar Pradesh government is planning to create a State Capital Region (SCR) along the lines of the National Capital Region (NCR), connecting Lucknow and the neighbouring districts in the central parts of the State, with the aim of enhancing the potential of the State capital for coordinated and balanced development.



Key Highlights:

- At the recent Uttar Pradesh Regional Planning Conclave-2023, suggestions were also floated to create six development regions in the State; Agra, Meerut, Varanasi, Gorakhpur, Bareilly and Jhansi, apart from the SCR so that the adjoining districts also benefit from these fast-developing centres.
- The State government's plan is aimed at negating the imbalanced growth and rapid population influx in the urban centres of Lucknow and Kanpur Naga, despite these two cities being smaller than many neighbouring districts.
- In the recent Global Investors' Summit, of the total investment proposals of ₹33.5 lakh crore received by the State, Lucknow received 6.79%, while the other seven districts together managed only 3.77%, highlighting the investors' district-centric interest and the widening gap between the State capital and its adjoining districts.

What's next?

- The Urban Development and Planning Department has held multiple rounds of meetings with allied departments to brainstorm on the idea and is likely to submit its proposal to the government on Lucknow-SCR, which will cover the seven adjoining districts of Hardoi, Sitapur, Rae Bareli, Kanpur Nagar, Kanpur Dehat, Unnao and Barabanki.

DUGDH SANKALAN SATHI MOBILE APP

Why in news?

- Recently, the Union Minister of Heavy Industries unveiled the 'Dugdh Sanakalan Sathi Mobile App' at Mussorie, Uttarakhand.

Developer:

- It is designed and developed by Rajasthan Electronics & Instruments Limited (REIL), Jaipur, a "Mini Ratna" Central Public Sector Enterprises under the Ministry of Heavy Industries.

Aim:

- It is poised to make a lasting impact on the Indian Dairy Industries by addressing key challenges in the milk collection process.
- This mobile app aims to improve the quality of milk, foster transparency among stakeholders, and streamline operations at the grassroots village level, including Milk Cooperative Societies.

Key features:

- Increased transparency among stakeholders
- Online monitoring of daily milk poured at Milk Cooperative Societies
- Real-time milk price updates from the cloud server, ensuring transparency and eliminating human errors
- Direct beneficiary transfers of milk payment and government subsidies to the milk producers' bank accounts through the app
- Push notifications for milk collection to the milk producers' app
- Multilingual app with support for English, Hindi, Punjabi, Telugu, and more.

Way Forward:

- It will bring significant benefits for all stakeholders involved in the milk collection process, including milk producers, cooperative societies, milk unions, and state federations.

PM KISAN MOBILE APP WITH FACE AUTHENTICATION FEATURE

Why in news?

- The PM-Kisan Mobile App with Face Authentication Feature was launched recently by Union Agriculture and Farmers' Welfare Minister under the 'Pradhan Mantri Kisan Samman Nidhi'.

Key features of new app:

- The new app is very easy to use and easily available for download on the Google Play Store.
- The app will also provide very important information related to the scheme and PM Kisan accounts to the farmers.
- In this, farmers can know the status of landseeding, linking of Aadhaar with bank accounts and e-KYC using the No User Status Module.
- The department has also roped in India Post Payment Bank (IPPB) to open Aadhaar linked bank accounts for beneficiaries at their doorstep and asked CSCs to organize village-level e-KYC camps with the help of States/UTs.

Remote e-KYC:

- Best example of modern technology using Face Authentication Feature from this app farmer can complete e-KYC remotely, sitting at home easily by scanning face without OTP or fingerprint and helped 100 other farmers to do e-KYC at their home.
- Recognizing the need to make e-KYC mandatory, the Government of India has extended the ability of farmers to perform e-KYC to officers of state governments, so that each officer can complete the e-KYC process for 500 farmers.

PM Kisan:

- PM Kisan is one of the world's largest DBT schemes in which farmers get Rs 6,000 directly transferred through Aadhaar linked bank accounts in three installments in a year. 2.42 lakh crore has been transferred to the accounts of more than 11 crore farmers, of whom more than 3 crore were women.
- Now the difficulties related to Aadhaar verification and bank account details updation on PM Kisan Portal have been resolved by effective use of digital public goods.

INTERNATIONAL RELATIONS

FOOD STANDARDS SAVE LIVES, SAY FAO AND WHO ON WORLD FOOD SAFETY DAY

Why in news?

- Recently, 'A Guide to World Food Safety Day' was released by the United Nations bodies Food and Agriculture Organization (FAO) and World Health Organization (WHO), on the fifth edition of World Food Safety Day June 7, 2023.
- It said the food standards save lives by playing a crucial role in preventing food-borne illnesses. Food safety, nutrition and food security are inextricably linked.

Vulnerability:

- An estimated 600 million fall ill after eating contaminated food and 420 000 die every year, resulting in the loss of 33 million healthy life years.
- The young and the vulnerable are disproportionately affected by the 200 different foodborne diseases that result from unsafe food, most of which are preventable. Children under five years of age carry 40 per cent of the foodborne disease burden, with 125,000 deaths every year.
- Unsafe food containing harmful bacteria, viruses, parasites or chemical substances causes more than 200 diseases, ranging from diarrhoea to cancers. It also creates a vicious cycle of disease and malnutrition, particularly affecting infants, young children, elderly and the sick.
- Foodborne diseases impede socioeconomic development by straining healthcare systems and harming national economies, tourism and trade. US$ 110 billion is lost each year in productivity and medical expenses resulting from unsafe food in low- and middle-income countries.

Codex standards:

- The Codex Alimentarius Commission, established in 1963 by the Food and Agriculture Organization of the United Nations (FAO) and WHO, develops harmonized international food standards, guidelines and codes of practice to protect the health of consumers and ensure fair trade practices in the food trade.
- It also promotes coordination of all food standards work undertaken by international governmental and nongovernmental organizations.
- The Codex Alimentarius has an impact on everyone, from consumers, food producers and processors to national food control agencies.

Way Forward:

- Food can only be safe if every person involved in its production, distribution and preparation ensures its safety.

INDIA SEEING SUBSTANTIAL RISE OF NON-COMMUNICABLE DISEASES, LANCET REPORT

Why in news?

- Recently, an Indian Council of Medical Research (ICMR) study on non-communicable diseases has highlighted an increasing trend of diabetes that may lead to increase in cardiovascular diseases among Indian population.

Details:

- The study by ICMR and India Diabetes has showcased the rising threat of non-communicable diseases (NCD) in the urban and rural population of India.
- Metabolic Non-communicable Disease Health Report of India surveyed 28 states, two union territories and Delhi across geographical, socio-economic and population for diabetes and other NCDs including hypertension, obesity and dyslipidemia (elevated cholesterol or fats in the blood).
- It is the largest study of diabetes and other metabolic NCDs in India.

Key Highlights:

- According to the study, there are 101 million people with diabetes and 136 million people with prediabetes, 315 million people with high blood pressure in India.

Obesity:

- The study showed that nearly 254 million Indians have generalized obesity, and over 351 million have abdominal obesity in the study period.
- General obesity is more than 25 percent in the southern and eastern states with the exception of Jharkhand, Bihar and Assam while abdominal obesity is high in all states except Jharkhand.

NCDs:

- Diabetes and prediabetes is a concern across states in the urban region. Uttar Pradesh has the lowest level of diabetes among states of 4.9 percent.
- The results show that 16.8 percent urban and 8.9 percent of rural population surveyed suffer from diabetes. In the case of hypertension, there is prevalence in 40.7 percent of urban and 33 percent in rural areas. Obesity and dyslipidemia also have a higher prevalence in urban populations than rural areas.
- The study shows women more are more prone to obesity and dyslipidemia. About 31 percent of females are affected by general obesity and 86.8 percent have dyslipidemia while the numbers are 25.4 percent and 75.1 percent, respectively, in male population.

Way Forward:

- The studies show that diabetes and prediabetes are pretty prevalent in India.
- The study is to understand how to prevent this and how to make changes in society which will reduce the burden of these non-communicable diseases which eventually result in high risk of cardiovascular disease, hypertension and others.

US WANTS TO REJOIN UNESCO AFTER YEARS OF DISPUTES OVER ISRAEL AND PALESTINE

Why in news?

- The United Nations Educational, Scientific and Cultural Organisation (UNESCO) announced recently that the United States will rejoin it in July, four years after it left the agency (along with Israel), alleging that UNESCO was biased against Israel.
- The move to rejoin will face a vote by UNESCO's member states and is expected to pass easily.

About UNESCO:

- UNESCO is a UN agency tasked with furthering international cooperation and peace through the promotion of educational, scientific and cultural causes.
- For instance, it designates locations globally as World Heritage Sites, which means international recognition and possible funding. The United States was a founding member of UNESCO in 1945.

What made the US leave UNESCO?

- The issue goes back to 2011, when UNESCO inducted Palestine as a member. This led to the US halting the agency's funding, worth millions of dollars, under then President Barack Obama.
- Palestine is not recognised as a sovereign state by the United Nations. It was included as a non-member observer State over Israel's objections in 2012, meaning it could participate in General Assembly proceedings but lacked voting rights.
- The Palestinians claim the West Bank, east Jerusalem and Gaza Strip territories captured by Israel in the 1967 war for an independent state. Israel says the Palestinians' efforts to win recognition at the UN are aimed at circumventing a negotiated settlement and meant to pressure Israel into concessions.
- Israel and the United States termed the inclusion of Palestine, UNESCO's previous criticism of Israel's occupation of East Jerusalem and naming what it said were ancient Jewish sites as Palestinian heritage sites as examples of anti–Israel bias.
- US laws, owing to the country's historical ties with Israel, prohibit funding to any UN agency that implies recognition of the Palestinians' demands for their own state. But this was negotiated recently through an agreement in 2022 that allowed for giving UNESCO funds again.

The US's earlier withdrawal from the UN:

- The United States previously pulled out of UNESCO under the Ronald Reagan administration in 1984 because it viewed the agency as mismanaged, corrupt and used to advance Soviet interests.
- It rejoined in 2003 under then President George Bush.

Why has the US moved to join UNESCO again?

- The decision to return was also due to China filling the gap left by the US in UNESCO policy making, such as in setting standards for artificial intelligence and technology education around the world.

VAIBHAV FELLOWSHIP PROGRAMME

Why in news?

- The Government has launched a new fellowship programme to connect the Indian STEMM diaspora with Indian academic and R&D institutions for collaborative research work leading to sharing of knowledge, wisdom, and best practices in the frontier areas of science & technology.

Key Highlights:

- The fellowship programme launched as a step to further those efforts by shaping and implementing the VAIBHAV programme, envisages collaboration between scientists of Indian Diaspora with Indian Higher Educational Institutions (HEIs), Universities, and/ or public funded Scientific Institutions.
- The VAIBHAV Fellow would identify an Indian Institution for collaboration and may spend up to two months in a year for a maximum of 3 years.
- Fellowship would include fellowship grant (INR 4,00,000 per month), international and domestic travel, accommodation and contingencies.

Implementation:

- The Vaishvik Bhartiya Vaigyanik (VAIBHAV) fellowships programme to be implemented by the Department of Science and Technology (DST), Ministry of Science and Technology, would be awarded to outstanding scientist/technologists of Indian origin (NRI/OCI/PIO) who are engaged in research activities in their respective countries.
- The 75 selected fellows would be invited to work in 18 identified knowledge verticals including quantum technology, health, pharma, electronics, agriculture, energy, computer sciences, and material sciences amongst others.

VAIBHAV Summit:

- The Government of India had organized the VAIBHAV Summit to connect Indian STEMM diaspora with Indian Institutions which was inaugurated by the Prime Minister and saw the participation of more than 25,000 attendees.
- Indian STEMM diaspora from more than 70 countries participated in the deliberations.

Way Forward:

- The VAIBHAV fellows are expected to collaborate with their Indian counterparts and help initiate research activities in the host institution in the cutting-edge areas of Science and Technology.

INDIA, AUSTRALIA ADD 15 NEW AREAS FOR TALKS ON COMPREHENSIVE TRADE DEAL

Why in news?

- Collaboration in space, mining and sports are among 15 new areas mutually identified by India and Australia for negotiations under the comprehensive free trade agreement.
- For the first time, these new segments would become part of a trade pact being negotiated by India.

Key Highlights:

- India and Australia have already implemented an interim trade pact in December last year and now negotiations are underway to expand the base of that pact for a CECA.
- In addition to five areas committed and which will be taken up under CECA, there are 15 new areas where mutual interest has been shown by both sides.
- Some of these are very new areas like space and sports, which we have not done (earlier) in any FTA (free trade agreement) till now. These are under discussion and we will see how it evolves. These areas may also include mining and defence collaboration.

IPEF:

- India has observer status in Indo-Pacific Economic Framework for Prosperity (IPEF), on the trade pillar and it is observing the developments very closely.
- IPEF was launched jointly by the US and other partner countries of the Indo-Pacific region on May 23, 2022 in Tokyo.
- The framework is structured around four pillars relating to trade, supply chains, clean economy and fair economy (issues like tax and anti-corruption). India has joined all the pillars except the trade one.
- Australia, Brunei Darussalam, Fiji, India, Indonesia, Japan, Republic of Korea, Malaysia, New Zealand, Philippines, Singapore, Thailand, the US and Vietnam are members of the bloc.
- Members of the 14-nation bloc IPEF have 'substantially' concluded the negotiations on the supply chains agreement.
- All the member countries are taking internal approvals on this agreement so that it can be operationalised latest by October.

PM MODI PROPOSES G 20 MEMBERSHIP FOR AFRICAN UNION

Why in news?

- Recently, Prime Minister Narendra Modi has written to the leaders of the G-20 nations proposing that the African Union be given full membership of the grouping at its upcoming summit in India.

Details:

- The Prime Minister has taken a "bold step" to enhance Africa's voice on the international stage and in shaping the future of "our shared world".
- This will be a right step towards a just, fair, more inclusive and representative global architecture and governance.

About African Union (AU):

- The African Union (AU) is a continental body consisting of 55 member states.

- The African Union is considered the top-most grouping representing the voice of Africa. It has been working towards ensuring the progress and economic growth of the African nations.
- It was officially launched in 2002 as a successor to the Organisation of African Unity.

Way Forward:

- India is hosting the G-20 summit in Delhi in September 2023.

INDIAN RAILWAYS SIGNED MOU WITH UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT/INDIA (USAID/INDIA)

Why in news?

- Indian Railways (IR) is proactively working towards the achievement of Net Zero Carbon Emission by 2030. IR has strategized multipronged approach.
- Recently, a Memorandum of Understanding (MoU) was signed between Indian Railways, Government of India and United States Agency for International Development/India (USAID/India) for collaboration on Renewable energy and Energy Efficiency.

Key Highlights:

- Through MoU, technical assistance and support would be provided to Indian Railways. The MoU broadly includes but not limited to the following areas:-
  - Long-term energy planning including clean energy for Indian Railways.
  - Develop an Energy Efficiency Policy and Action Plan for IR Buildings.
  - Planning for clean energy procurement to achieve Indian Railways' net-zero vision.
  - Technical support for addressing regulatory and implementation barriers.
  - Bid design and bid management support for system-friendly, large-scale renewable procurement.
  - Supporting Indian Railways in the promotion of e-mobility.
  - Collaboratively host events, conferences, and capacity-building programs in the mentioned identified areas including field visits and study tours (domestic/international).

Way Forward:

- The collaboration of Indian Railways with USAID, India will go a long way in helping Indian Railways to achieve Net Zero Carbon Emission by 2030.

About USAID:

- USAID (United States Agency for International Development) is an agency of the U.S. Government that supports international development and advances its Mission objectives by supporting economic growth, agriculture and trade, clean energy, climate change mitigation and adaptation, global health, democracy and conflict mitigation and management, and humanitarian assistance.

SENATE INDIA CAUCUS TO INTRODUCE BILL TO ADD INDIA TO NATO PLUS BLOC

Why in news?

- The U.S. Senate's India Caucus Co-Chairs, Mark Warner (Democrat, Virginia) and John Cornyn (Republican, Texas), will introduce legislation to give India 'NATO plus five' defence status.
- The Warner announcement follows a recommendation from a U.S. House of Representatives committee on China that India be included in the club.

What is NATO Plus?

- NATO Plus, currently NATO Plus 5, is a security arrangement that brings together NATO and five aligned nations: Australia, New Zealand, Japan, Israel and South Korea to boost defence and intelligence ties.

Why US is keen on making India a member?

- The main reason behind the US being so interested in inclusion of India in the bloc is attributed to ensure seamless intelligence sharing between the group countries and India would get easy access to the cutting-edge military technology without any delay.
- India is already an important member of the Quad group, which includes Japan, Australia and the United States.

Way Forward:

- It would facilitate the transfer of topmost American technology and defence equipment without much bureaucratic hassle, amid growing challenges from a rising China.

ECONOMY

NEPAL PRIME MINISTER SEEKS INDIAN INVESTMENTS IN MINING, AGRI, ENERGY, HOSPITALITY, IT

Why in news?

- Nepal's Prime Minister Pushpa Kamal Dahal 'Prachanda' is on a four-day visit to India.

Business opportunities in Nepal:

- He said huge business opportunities are there for investors and sought Indian investments in various sectors such as mining, manufacturing, agriculture, energy, tourism, infrastructure, information technology and hospitality.
- He said that abundance of natural resources, large pool of human capital, a promising market with sound policies and regulatory framework makes Nepal an ideal attractive destination for investment
- Nepal's foreign investment policy is liberal and forward looking and it has opened almost every sector for overseas investments.
- The modern infrastructure at border areas offers opportunities for cross border investments and industrialisation. Vast investment opportunities are there in the hydro power sector also.
- The 900-MW Arun-III project with Indian investment is nearing completion and several other power projects will certainly generate fresh momentum in harnessing water resources in Nepal.

Key agreements:

- The Indian side agreed to the first trilateral power trade from Nepal to Bangladesh through India for up to 40 mega watt of power, a move that is seen as a significant step towards ensuring greater regional cooperation.
- The two sides signed a number of agreements, including an MoU between NHPC and VUCL (Vidyut Utpadan Company Ltd.) of Nepal, for the development of Phukot Karnali Hydroelectric Project and a Project Development Agreement for Lower Arun Hydroelectric Project between SJVN (India) and Investment Board of Nepal
- In total, India and Nepal signed seven pacts which included a revised treaty of transit.

Bilateral trade:

- Land-locked Nepal relies heavily on India for the transportation of goods and services.
- The country shares a border of over 1,850 kilometres with five Indian states — Sikkim, West Bengal, Bihar, Uttar Pradesh and Uttarakhand.
- The bilateral trade between the countries stood at USD 8.9 billion in 2022-23 as against USD 11 billion in 2021-22.

MOU FOR DEVELOPMENT OF PHUKOT KARNALI HYDRO ELECTRIC PROJECT (480MW)

Why in news?

- NHPC Limited (A Govt. of India Enterprise) and Vidhyut Utpadan Company Limited (VUCL), Nepal signed an MoU (Memorandum of Understanding) in New Delhi for development of Phukot Karnali Hydro Electric Project (480MW) in Nepal.
- The MoU was signed in the presence of Prime Minister of India and Nepal.

Details:

- NHPC Limited, a Schedule 'A' Enterprise of the Government of India with 'MINI RATNA' status, is a premier PSU in India for development of hydropower.
- Vidhyut Utpadan Company Limited (VUCL), Nepal is responsible to develop, build, own and operate large-scale hydropower projects in public-private partnership model in Nepal.

Key Highlights:

- The project will use the flow from the Karnali River for power generation and the generated power will be fed into integrated power system of Nepal.
- The installed capacity of the project shall be 480 MW with average annual generation of about 2448 GWh.
- The key features of the project are a 109 metre high RCC dam and an underground power house where the 06 turbines of 79 MW each shall be housed.
- Additionally, to utilize minimum environmental release one Surface Power House of 6 MW capacity i.e. two machines of 3 MW each is also planned. This project is conceived as a Peaking Run-of-River (PRoR) type scheme.

Way Forward:

- Signing of this MOU is a landmark step towards India-Nepal Joint Vision on Power Sector Cooperation.

IRDAI EYES INSURANCE PUSH IN RURAL AREAS WITH 'BIMA VAHAK'

Why in news?

- The Insurance Regulatory and Development Authority of India (IRDAI) recently issued draft guidelines for Bima Vahaks, a new initiative aimed at enhancing insurance inclusion and awareness across the country.
- Bima Vahaks or insurance volunteers, are set to become a powerful force in extending insurance coverage to every Indian, regardless of their geographical location.

Types:

- The guidelines define two types of Bima Vahaks: Corporate Bima Vahaks and Individual Bima Vahaks.
- Corporate Bima Vahaks refer to legal entities registered under Indian laws and engaged by insurers.
- On the other hand, Individual Bima Vahaks can be either appointed by an insurer or appointed by a Corporate Bima Vahak.
- Insurers are allowed to engage the services of Corporate Bima Vahaks and directly appoint Individual Bima Vahaks for solicitation of insurance business and to facilitate policy and claims servicing. However, the appointing insurer holds full responsibility for the actions and conduct of the Bima Vahaks.

Key Highlights:

- Insurers are encouraged to progressively engage Individual Bima Vahaks and Corporate Bima Vahaks to achieve coverage of every Gram Panchayat. Lead insurers of each state and union territory are responsible for coordinating the deployment of resources to ensure maximum coverage.
- The scope of activities assigned to Bima Vahaks includes collecting proposal information, KYC compliance, coordination and support in policy, claims-related servicing, and facilitating premium payment processes.
- To ensure consumer protection, insurers and Corporate Bima Vahaks are required to issue identification cards to Individual Bima Vahaks and implement suitable monitoring frameworks for product solicitation and sales.
- In addition, retail outlets operated by Corporate Bima Vahaks must prominently display the name(s) of the Bima Vahak(s), appointing insurer's details, services offered, contact details of designated grievance redressal officers, and the Insurance Ombudsman's contact information.
- The draft guidelines also empower the Chairperson of the Authority to issue clarifications to resolve any difficulties in the application or interpretation of these guidelines.

Way Forward:

- With the dedicated efforts of Bima Vahaks, insurance coverage can be extended to even the remotest corners of the country, fostering trust and reliability within local communities.

NHAI FIRST 'SUSTAINABILITY REPORT' CAPTURES INITIATIVES TAKEN FOR ENVIRONMENT SUSTAINABILITY

Why in news?

- The National Highways Authority of India (NHAI) has published its inaugural 'Sustainability Report for FY 2021–22,' showcasing its dedication to environmental sustainability and social responsibility.
- It covers NHAI's governance structure, stakeholders, environment and social responsibility initiatives.

Key Highlights

Reduction in emissions:

- From FY 2019-20 till 2021-22 direct emission reduced by 18.44% and 9.49% due to less fuel consumption. NHAI continues to work towards reducing indirect emissions as well, by transiting towards clean and green energy sources.
- Green House Gas (GHG) Emissions from energy consumption, operations, transport and travel measured in Metric Tonnes CO2 equivalent /km constructed saw a decline of 9.7% in FY 2020-21 and 2% in FY 2021-22.

- Similarly in operations, energy intensity in Giga Joules/km reduced by 37% in FY 2020-21 and 27% in FY 2021-22, while the kilometers constructed through the reporting period has risen steadily.
- With over 97 percent penetration, Electronic Toll Collection through FASTag has contributed to reduce the carbon footprint.

Innovations:

- Apart from this, NHAI has been using recycled materials for National Highway construction. Use of fly-ash and plastic waste in construction has increased over the last three years. NHAI has been encouraging use of Recycled Asphalt (RAP) and Recycled Aggregates (RA) in the National Highway construction.
- In order to ensure sustainable environmental growth, more than 100 Wildlife Crossings were created in three years across 20 States as a measure for wildlife protection and conservation to reduce man-animal conflict.

Plantation drive:

- Over the years, NHAI has been undertaking plantation drives to develop eco-friendly National Highways. There has been a significant increase in number of saplings planted from 2016-17 till 2021-22. Around 2.74 crore saplings were planted till 2021-22 to offset direct emissions from the vehicles.
- NHAI has partnered with different stakeholders such as State Rural Livelihood Mission (SRLM), Self Help Groups, CSR partners and NGOs to collaboratively organize plantation drives.

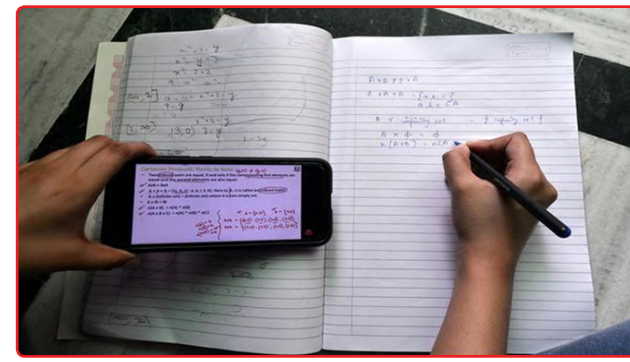
Employment:

- In addition to sustainable development, the report also highlights NHAI's commitment to create inclusive and responsible work practices. Over last three years, women employment and employment of marginalized communities at NHAI has increased.
- With performance-based management system, NHAI has successfully promoted/encouraged women gender diversity and minority employees over the past 3 years with steady increase in female hiring by 7.4 percent and total increase of 3 percent in overall work force in three financial years.

Way Forward:

- NHAI has taken significant steps towards adopting sustainable and eco-friendly practices, including the use of renewable energy sources, promoting green highways, and adopting waste management practices.
- Going forward, NHAI remains committed to ensure that its projects are not only economically viable but also socially responsible and environmentally sustainable.

HOW KFON AIMS TO BRIDGE THE DIGITAL DIVIDE IN KERALA



Why in news?

- Recently, the Kerala government officially launched the Kerala Fibre Optical Network (KFON), one of its flagship projects envisaged during the first term of Chief Minister Pinarayi Vijayan.

Background:

- On November 7, 2019, the Left Democratic Front (LDF) government in Kerala announced that access to the Internet would be a basic right in the State, becoming the first State in the country to do so. The declaration came three years after the UN had passed a resolution recognising Internet access as a basic human right.
- The announcement was accompanied by a detailed plan to ensure that it would become a ground reality, with the setting up of the Kerala Fibre Optic Network (KFON), through which Internet connections would be provided free of cost to 20 lakh below-poverty-line (BPL) families.
- The project is aimed at ensuring universal Internet access and narrowing the digital divide, which has become especially acute after the COVID-19 outbreak.

How is the government running the network and providing services?

- The Kerala government's role involves setting up the vast infrastructure required for providing Internet, especially to remote corners of the State. The network has reached remote locations, including tribal hamlets in Wayanad and elsewhere, which had remained out of the information superhighway until now.
- The cabling works, stretching to 34,961 km, piggybacks on the Kerala State Electricity Board's (KSEB) existing infrastructure.
- KFON Limited is, in fact, a joint venture of the KSEB and the Kerala State Information Technology Infrastructure Ltd (KSITIL).
- In July 2022, the Department of Telecommunications (DoT) granted KFON an infrastructure provider (IP) licence and also approved it as an internet service provider (ISP).

How will the plan be rolled out?

- The aim was to provide Internet connections to 14,000 BPL families, with 100 each from the State's 140 assembly constituencies in the first phase. The panchayats and the urban local bodies were given the responsibility of choosing the beneficiaries. However, the process of selection has been slow, with many local bodies delaying the submission of a list of beneficiaries from their area.
- As of now, Internet connection has been provided to 7,000 BPL families across the State. Each household will get 1.5 GB of data per day at 15 Mbps speed. In the second phase, Internet services will be made available to the public at affordable rates.
- Free Internet connections for BPL families and government institutions is just one part of the ₹1,548 crore KFON project. The rest of the network will be monetised.

What is the road ahead?

- The commissioning of the first phase of KFON comes after the Chief Minister declared Kerala as India's first fully e-governed State. The e-office system has already been implemented in the Secretariat, district collectorates, commissionerates and directorates.
- As many as 900 government services, comprising all the services usually required by the public, are now available through a single-window portal.
- The government has also begun a digital literacy campaign at the grassroot level through various local bodies to ensure that everyone is equipped to access basic services through the Internet.
- If the KFON project achieves what it has envisaged, it can bring about a change at the ground level as far as access and opportunities are concerned.

CENTRE ANNOUNCES 4 INITIATIVES TO STRENGTHEN 1,514 URBAN CO-OPERATIVE BANKS

Why in news?

- Recently, the Central Government announced four important initiatives to strengthen 1,514 Urban Co-operative Banks (UCBs) in the country

Key Highlights:

- In order to expand their business, Urban Cooperative Banks (UCBs) can now open new branches.
- UCBs can now open new branches up to 10% (maximum 5 branches) of the number of branches in the previous financial year without prior approval of RBI in their approved area of operation.
- In order to avail this facility, UCBs have to get the policy approved by their board and comply with the Financially Sound and Well Managed (FSWM) Norms.

UCBs can also do One Time Settlement at par with Commercial Banks:

- RBI has notified a framework governing this aspect for all regulated entities including Urban Co-operative Banks.
- Now co-operative banks through board-approved policies may provide process for technical write-off as well as settlement with borrowers. This has brought cooperative banks at par with other commercial banks now.

Revised timelines for PSL targets given to UCBs:

- The Reserve Bank of India has decided to extend the timeline for UCBs to achieve Priority Sector Lending (PSL) targets by two years i.e. up to March 31,2026. Deadline of March 31, 2023 to achieve PSL target of 60% has now also been extended to March 31,2024.
- The excess deposits, if any, after clearing the shortfall of PSL during FY 2022-23 will also be refunded to UCB.
- Since UCB work in urban areas unlike commercial banks who have branches in rural areas as well, they were facing hardships on this score.

Designating a Nodal Officer in RBI:

- In order to meet the long pending demand of the cooperative sector for closer coordination and focused interaction, RBI has recently notified a nodal officer as well.

Way Forward:

- The above initiatives will further strengthen the Urban Co-operative Banks.

GOVT ASKS REGULATOR CERC TO BEGIN PROCESS FOR COUPLING POWER EXCHANGES

Why in news?

- The Ministry of Power has asked Central Electricity Regulatory Authority (CERC) to initiate the process of coupling multiple power exchanges, a mechanism which seeks to ensure uniformity in price discovery of energy at trading platforms.

Details:

- At present India has three power exchanges; Indian Electricity Exchange (IEX), Power Exchange of India (PXIL) and Hindustan Power Exchange (HPX).
- In the present scenario, buyers and sellers at each exchange do trading of electricity and discover spot price separately at these exchanges. After coupling of exchanges, the price discovery would be uniform.

Advantages:

- This will give a fillip to the service levels in the power market, and ensure better transparency and uniform prices discovery across exchanges.
- The move is also expected to bring down the power tariff in the country significantly.

Fact:

- The IEX has the largest market share of 88 per cent in total power trade at multiple exchanges in India.

UAE EMERGES FOURTH LARGEST INVESTOR IN INDIA, FDI JUMPS OVER 3X IN FY23

Why in news?

- The United Arab Emirates (UAE) has emerged as the fourth largest investor in India during 2022-23.

Details:

- In the last fiscal, foreign direct investment (FDI) from the UAE to India jumped over three-fold to USD 3.35 billion from USD 1.03 billion in 2021-22, the data of the Department for Promotion of Industry and Internal Trade (DPIIT) showed.
- The UAE was the fourth largest investor in India in 2022-23 compared to the seventh in 2021-22.
- Singapore was the largest investor in India with USD 17.2 billion investment in FY23, followed by Mauritius (USD 6.1 billion) and the US (USD 6 billion).

Factors responsible for UAE investments:

- UAE's investments in India are mainly in sectors like services, sea transport, power and construction activities.
- One of the crucial factors for the increase in foreign direct investment (FDI) from UAE is the signing of the Comprehensive Economic Partnership Agreement (CEPA) between India and UAE on February 18, 2022 (effective from May 1, 2022).
- Under the pact, a number of goods from both countries are getting zero-duty access to each other's markets, besides eased norms for promoting investments.
- The country accounts for about 2.5 per cent of the total FDI India received between April 2000 and March 2023. During this period, India has attracted USD 15.6 billion worth of overseas inflows from the UAE.
- Apart from CEPA, another growth engine of FDI from UAE in India is the investment commitment from UAE. UAE has committed to invest USD 75 billion in the Indian infrastructure sector over a period of time. It has also committed to partner with India in the renewable energy sector.

Innovation Program:

- Among other agencies, Abu Dhabi Investment Office through their Innovation Program is providing active support to innovation-driven startups through financial and non-financial incentives like information on data, network, licensing, logistics, real estate, visa etc.
- Such expansion ideas/ activities of Indian startups also provide an incentive to UAE-based investment funds to invest more in innovation-based startups in India.

ADB, INDIA SIGN $130 MILLION LOAN TO PROMOTE HORTICULTURE IN HIMACHAL PRADESH

Why in news?

- Recently, the Government of India and the Asian Development Bank (ADB) signed a $130 million loan to increase agricultural productivity, improve access to irrigation and promote horticulture agribusinesses to raise farmers' income in the state of Himachal Pradesh.

Significance:

- Improving subtropical horticulture in the southern areas of Himachal Pradesh, hitherto dependent on

temperate horticulture in northern areas, offers opportunities for crop diversification, climate adaptation and more equal economic and social development across the state's rural areas.

- Supporting horticulture value chains will also boost the subsector's contribution to the country's development and food security.

Key Highlights:

- The project interventions will help increase the income and resilience to the effects of climate change of at least 15,000 farm households across 7 districts of the state namely Bilaspur, Hamirpur, Kangra, Mandi, Sirmour, Solan, and Una.
- These households have stopped farming or have reduced their farming areas because of a lack of irrigation facilities and crop damage by wild and stray animals.
- The project will improve on-farm irrigation and water management in about 6,000 hectares of farmland by rehabilitating or building new irrigation schemes and strengthening the capacity of WUAs for micro irrigation management through joint efforts from the state's Jal Shakti Vibhag (Water Resources Department) and Department of Horticulture (DOH).

CHPMAs:

- The project will also help create an ecosystem to enhance farmers' access to markets of subtropical horticulture. The farmers will be organised into cluster-wide community horticulture production and marketing associations (CHPMAs) and district-wide CHPMA cooperative societies.
- CHPMA apex institution, a farmer producer company (FPC), will lead state-wide agribusiness development with the aim of ensuring profitability and access to markets of subtropical horticulture.
- The FPC will handle business plan development; agribusiness promotion; and designing value-addition facilities such as sorting and packaging facilities, and storage and collection centres. It will also assist CHPMAs in managing these facilities.

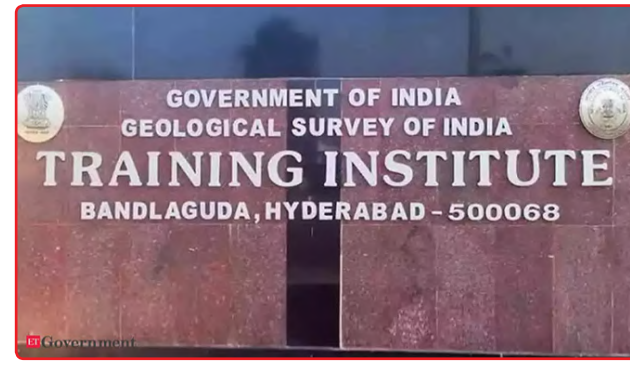
Way Forward:

- The project will also modernise public and private subtropical horticulture nursery facilities for improved plant health, and boost beneficiary farmers' access to information and communication technologies, and other digital agri-technology systems for real-time farm advisories and better CHPMA management.

GEOLOGICAL SURVEY OF INDIA TRAINING INSTITUTE (GSITI), HYDERABAD GETS ACCREDITED AS "ATHI UTTAM"

Why in news?

- The Geological Survey of India Training Institute (GSITI) functioning under the Ministry of Mines, has been awarded with the accreditation by the National Accreditation Board of Education and Training (NABET) in recognition of the yeomen services it has rendered and high standards maintained in the field of earth science training.



- The team from Capacity Building Commission (CBC), NABET and Quality Control of India conducted the on-site assessment and awarded the Certificate of Accreditation with the grading of Athi Uttam.

About GSITI:

- Established in 1976, GSITI with its headquarters at Hyderabad, has six Regional Training Divisions (RTD) located at Hyderabad, Nagpur, Jaipur, Lucknow, Kolkata and Shillong.
- Four Field Training Centers (FTCs) are also established at Chitradurga (Karnataka), Raipur (Chhattisgarh), Zawar (Rajasthan) and Kuju (Jharkhand).

Role:

- These Centers are established as per the vision of the Ministry of Mines to impart various trainings to geoscience professionals, teachers, researchers and students in various subjects of geology.
- Thus, GSITI is a national training facility, under the Ministry of Mines that provides training and capacity building to multiple stakeholders including Central and State Departments, PSUs (MECL, ONGC, OIL, NMDC), national academic institutions (IITs, Central Universities and Colleges) and colleges.
- The institute regularly conducts courses on remote sensing under NNRMS Programme sponsored by the Indian Space Research Organization (ISRO).
- It is an institute of international repute and offers training to participants of developing nations under ITEC programme sponsored by the Ministry of External Affairs. Professionals from 75 nations have already trained by the institute.

WHY DID THE GOVT. IMPOSE A CEILING ON WHEAT STOCKS?

Why in news?

- Recently, in a move endeavouring to manage the "overall food security and to prevent hoarding and unscrupulous speculation", the Union Government imposed limits on stock of wheat that can be held by

traders, wholesalers, retailers, big chain retailers and processors.

- The objective is to stabilise the price of the essential commodity by steadying supply. The order stood effective with immediate effect until the end of March 2024.

What are the limits?

- The permissible stock that traders/ wholesalers can hold is 3,000 metric tonnes.
- Retailers and big chain retailers can hold up to 10 metric tonnes at each of their outlets, while the latter can hold up to 3,000 metric tonnes at all their depots combined. Processors would be able to stock 75% of the annual installed capacity.
- The mentioned entities are expected to declare their stock positions and update them regularly on the Department of Food and Public Distribution's portal.
- If the stock held by them are higher than the limit, they will have 30 days from the day of issue of notification to bring the same under the prescribed limits.

What are the additional orders?

- The government has also decided to offload 15 lakh tonnes of wheat from the central pool via the Open Market Sale Scheme (OMSS) to flour mills, private traders, bulk buyers, manufacturers of wheat products through e-auction. The idea is to control retail prices of wheat.
- They would be sold in lot sizes of 10 to 100 metric tonnes. This would be the first tranche, and more could be released depending on the prices and demand.
- The government would offload rice under OMSS to moderate its prices. The quantity of the first phase of the e-auction (for rice) would be decided shortly.

Why is there a concern?

- The moves come in the backdrop of rising concerns about the overall wheat output taking a hit after the unseasonal rains and hailstorms towards the end of March and early April alongside hotter temperatures in February.
- Lower production leads to higher prices of the crop. This could in turn create conditions for local prices exceeding the government's purchase prices and thus, bothering the latter's endeavour to stock up supplies.
- The daily average price of wheat at the retail level, on June 14, stood at ₹29/kg compared to ₹27.54/kg a year back. At the wholesale level, it stood at ₹2,593.5 for each quintal against ₹2,557.89/quintal for the previous month and about ₹2,423/quintal a year back.
- The Food Corporation of India is entrusted with the responsibility to ensure food grains are accessible at reasonable prices to the vulnerable sections of society under the Public Distribution System.
- The government had set a target of procuring 341.5 lakh metric tonnes of wheat for the Central Pool in the ongoing Rabi Marketing Season (RMS) 2023-24. RMS rolls from April to March with the maximum proportion acquired around April and June.

What about production?

- Notwithstanding the warnings from experts about the potential effects of El Nino, the Agricultural Ministry estimates the production of wheat at a record 1,127.43 lakh metric tonnes for the agriculture year 2022-23, higher by 50.01 lakh metric tonnes from previous year's production.
- The optimism is premised around the increased area of wheat sowed and better yield.

BIS INTRODUCES STANDARD IS 18267, 2023 FOR AGRI BY PRODUCT UTENSILS

BUREAU OF INDIAN STANDARDS

BIS

Why in news?

- The Bureau of Indian Standards (BIS) has published IS 18267: 2023 'Food Serving Utensils Made from Agri By-Products – Specification' aimed at reducing plastic pollution and promoting sustainability.
- The standard provides comprehensive guidelines to manufacturers and consumers, ensuring uniformity in quality requirements across the country.

Advantages:

- The implementation of this standard has extensive advantages as using biodegradable agri by-product utensils can contribute towards environmental safety, conserve natural resources, and promote a circular economy.
- These utensils are free from harmful additives and ensure consumer well-being.

- The standard also creates economic opportunities for farmers and supports sustainable agricultural practices, contributing to rural development.

Disposable tableware:

- The rising use of disposable tableware worldwide is driving the global market for disposable tableware.
- Disposable plate's market size was valued at USD 4.26 Billion in 2020 and is projected to reach USD 6.73 Billion by 2028, growing at a Compound Annual Growth Rate (CAGR) of 5.94% from 2021 to 2028.

Biodegradable cutlery:

- In India, numerous large-scale and Micro, Small & Medium Enterprises (MSME) level manufacturers are actively contributing to the production of biodegradable cutlery, and they stand to benefit immensely with this Standard.
- The demand for these products is consistently rising, leading to a steady growth in the number of manufacturers involved in their production.

Set Standard:

- The standard covers various aspects, including raw materials, manufacturing techniques, performance, and hygiene requirements for the production of biodegradable utensils.
- It specifies the use of agricultural by-products, such as leaves and sheaths, as preferred materials for making plates, cups, bowls, and more.
- The standard recommends appropriate parts of plants and trees and provides manufacturing techniques like hot pressing, cold pressing, moulding, and stitching.
- It also emphasizes smooth surfaces, non-sharp edges, and prohibits the use of chemicals, resins and adhesives.

INTERNAL SECURITY

IRAN UNVEILS NEW 'HYPERSONIC MISSILE' THAT CAN COVER 1,400 KM

Why in news?

- Recently, Iran has unveiled its first-ever hypersonic missile, Fattah, which it says can penetrate missile defence systems and will give it a military edge.

Details:

- The missile can move at a speed of up to Mach 15 (5,145 metres or 16,880 feet per second), has a range of 1,400km (870 miles) and features a moveable secondary nozzle and employs solid propellants that allow for high manoeuvrability.
- Supreme Leader Ayatollah Ali Khamenei has chosen the name, which roughly translates to "the opener".

Hypersonic missiles:

- Hypersonic missiles move at five times the speed of sound or greater and are manoeuvrable, making them difficult for defence systems and radars to target.
- The United States, Russia, China and North Korea are believed to be the only countries to have successfully tested hypersonic missiles, but exact details of the weaponry remain scant.

Concerns of West:

- Iran claimed that it had created a hypersonic missile capable of travelling at 15 times the speed of sound, adding a new weapon to its arsenal as tensions remain high with the United States over its nuclear programme.
- It was unveiled even as Iran said it would reopen its diplomatic posts in Saudi Arabia after reaching a détente with Riyadh following years of conflict.
- The West and Israel have repeatedly expressed concern over Iran's missile programme, saying the country's ballistic missiles could potentially be used to carry nuclear warheads, something Tehran denies pursuing.
- The Islamic Revolutionary Guard Corps (IRGC) earlier successfully tested a new ballistic missile with a range of 2,000km (1,240 miles) that earned more criticism from the West, with France claiming it violated the United Nations resolution that underpins the country's comatose 2015 nuclear deal with world powers.

MAIDEN INDIA-FRANCE UAE MARITIME PARTNERSHIP EXERCISE

Why in news?

- The first edition of India, France and UAE Maritime Partnership Exercise commenced recently in the Gulf of Oman.

Aim:

- The maiden exercise aims to enhance trilateral cooperation between the three navies and pave way for adopting measures towards addressing traditional and non-traditional threats in the maritime environment.

Key Highlights:

- INS Tarkash and French Ship Surcouf both with integral helicopters, French Rafale aircraft and UAE Navy Maritime Patrol Aircraft are participating in the exercise.
- The exercise scheduled over two days will witness a wide spectrum of naval operations such as Surface Warfare, involving tactical firing and Drills for Missile engagements on surface targets, Helicopter Cross Deck Landing Operations, Advanced Air Defence Exercise and Boarding operations.
- The exercise would also include cross embarkation of personnel for exchange of best practises.

Way Forward:

- The exercise will enhance collaboration in ensuring safety of mercantile trade and freedom of navigation at high seas in the region.

ARMY AIR DEFENCE WIDENS WINGS

Context:

- A range of new systems, mostly indigenous, are being inducted, with new technologies factoring in the new realities in the present transformation of the Army Air Defence (AAD).
- Bringing it all together is a new automation initiative under Project Akashteer, which will build a comprehensive air defence picture for the monitoring, tracking and shooting down of air defence assets

Project Akashteer:

- The nearly ₹2,000-crore contract for Akashteer, a networking and automation project on the same lines as the Indian Air Force's Integrated Air Command and Control System network, was signed in March 2023.
- This will link all the radars and control centres of AAD and consolidate the air defence picture, removing duplications or overlaps and also integrate all the weapons.
- Akashteer will also be able to communicate with the IAF's network.

New threats:

- Before the 2020 stand-off with China, the Army's focus was predominantly on India's western border with Pakistan.
- However, air defence requirements on the northern borders are different from the western front; the need is for light-weight radars and weapon systems with mobility for deployment in the mountains while catering to the infantry's requirements.
- The war in Ukraine has also changed the requirements, forcing the Army to factor in new threats to air defence such as unmanned aerial vehicles or UAVs, loitering munitions, swarm drones and cruise missiles.

New technology:

- The Ukraine conflict has shown that Man Portable Air Defence Systems (MANPADS) are highly effective when in range with night vision enabled. The Indian Army is focussing on laser beam-riding MANPADS and has already initiated the procurement process.
- Another focus area is gallium nitride-based modules for radars which can significantly reduce weight, a critical factor in the mountains.
- Another emerging threat to air defences is loitering munitions, for which the best counter is high-rate gun systems, better optic sights, fragmented ammunition and active electronically scanned array radars.

Inducting new SAMs:

- In March 2023, the Defence Ministry signed a contract worth more than ₹8,160 crore with Bharat Dynamics Limited for two regiments of improved Akash surface-to-air missile (SAM) systems.
- These Akash regiments are tailor-made for the mountains, with modifications having been made after a year of trials.
- The deliveries and induction should happen in the next couple of years as the system is already under production and domestic capability has come up well.

Concerns:

- However, the shortage of components and hardware for air defence systems worldwide, since the beginning of the war in Ukraine, could potentially slow the pace of inductions.
- For instance, there is a shortage of chips for radars that could slow down manufacturing and deliveries as these are mostly imported.

EX EKUVERIN

Why in news?

- Recently, the 12th edition of joint military exercise "Ex Ekuverin" between the Indian Army and the Maldives National Defence Force has commenced at Chaubatia, Uttarakhand from 11 to 24 June 2023.

Key Highlights:

- A platoon strength contingent from Indian Army and Maldives National Defence Force will be participating in 14 days long exercise.
- The exercise is aimed at enhancing interoperability in Counter Insurgency/ Counter Terrorism Operations under the UN mandate and carry out joint Humanitarian Assistance and Disaster Relief operations.
- The focus is to share best practices, enhance coordination and cooperation between both the forces at tactical level.

About Ex Ekuverin:

- Ekuverin meaning 'Friends' is a bilateral annual exercise conducted alternatively in India and Maldives.
- The 11th edition of the exercise was held in Maldives in December 2021.

Way Forward:

- The defence cooperation between the two countries extends from joint exercises to assisting Maldives with defence training and equipment requirements.
- Both the nations have very close and friendly relations in economic, cultural and military cooperation. 'Ex Ekuverin' will assist in further bolstering of these ties between the two nations.

LAUNCH OF 'ANJADIP' THIRD SHIP OF ASW SWC (GRSE)

Why in news?

- Recently, 'Anjadip', the 3rd of eight ships of ASW Shallow Water Craft (SWC) Project being built by M/s GRSE for Indian Navy, was launched at M/s L&T, Kattupalli.
- The keel for the 7th ASW SWC ship was also laid.

Why named as Anjadip?

- The ship has been named Anjadip to signify the strategic maritime importance accorded to the island of Anjadip, located off Karwar.
- The island is connected to the mainland by a breakwater and is part of INS Kadamba.

ASW SWC ships:

- Arnala class of ships will replace the in-service Abhay class ASW Corvettes of Indian Navy and are designed to undertake anti-submarine operations in coastal waters, Low Intensity Maritime Operations (LIMO), and Mine Laying operations including subsurface surveillance in littoral waters
- The 77 m long ASW SWC ships have a displacement of 900 tons with a maximum speed of 25 knots and endurance of 1800 NM.
- The ASW SWC ships will have over 80% indigenous content, thereby ensuring that large scale defence production is executed by Indian manufacturing units, generating employment and capability enhancement within the country.

Background:

- The contract for building eight ASW SWC ships was signed between MoD and Garden Reach Shipbuilders & Engineers (GRSE), Kolkata on 29 Apr 2019.
- As per the build strategy, four ships are being built at GRSE, Kolkata and construction of balance four ships has been sub-contracted to M/s L&T Shipbuilding, Kattupalli.

Way Forward:

- The first ship of the project is planned to be delivered to Indian Navy by Dec 23.

LAUNCH OF 'SANSHODHAK', FOURTH SHIP OF SURVEY VESSEL (LARGE) PROJECT

Why in news?

- Recently, 'Sanshodhak', the fourth of four ships of Survey Vessels (Large) (SVL) Project, being built by L&T/ GRSE for Indian Navy was launched at Kattupalli, Chennai.

- The ship named 'Sanshodhak', meaning 'Researcher', signifies the primary role of the ship as a Survey Vessel.

Background:

- The contract for building four SVL ships was signed between MoD and Garden Reach Shipbuilders & Engineers (GRSE), Kolkata in Oct 2018.
- As per the build strategy, the first ship would be built at GRSE, Kolkata and construction of the remaining three ships upto outfitting stage, has been sub-contracted to M/s L&T Shipbuilding, Kattupalli.
- The first three ships of the project, Sandhayak, Nirdeshak and Ikshak were launched on 05 Dec 21, 26 May 22 and 26 Nov 22 respectively.

Salient feature of SVL ships:

- SVL ships will replace the existing Sandhayak Class survey ships, with new generation hydrographic equipment, to collect oceanographic data.
- The Survey Vessel (Large) ships are 110 m long, 16 m wide with a displacement of 3,400 tons. The hull of these ships is made from indigenously developed DMR 249-A steel manufactured by Steel Authority of India Limited.
- With a capability to carry four Survey Motor Boats and an integral helicopter, the primary role of the ships would be to undertake full scale coastal and deep-water hydrographic surveys of Ports and navigational channels.
- The ships would also be deployed for collecting oceanographic and geophysical data for defence as well as civil applications. In their secondary role, the ships are capable of providing limited defence, HADR, and can serve as Hospital ship during emergencies.

Indigenous:

- The Survey Vessels Large will have over 80% indigenous content by cost, ensuring defence production by Indian manufacturing units with a spin off in employment generation and warship building capability in the country.
- Launch of the fourth Survey Vessel reinforces resolve in indigenous shipbuilding, as part of the Government's vision of 'Make in India' and 'Aatma Nirbhar Bharat'.

EX KHAAN QUEST 2023

Why in news?

- Multinational Peacekeeping Joint Exercise "Ex Khaan Quest 2023" featuring participation from military contingents and observers from over 20 countries has commenced in Mongolia recently.

Details:

- The exercise is co-sponsored by Mongolian Armed Forces (MAF) and United States Army Pacific Command (USARPAC).

- The Indian Army is represented by a contingent from the Garhwal Rifles.

Key Highlights:

- The 14-day exercise is aimed at enhancing interoperability of the participating nations, for sharing experience and to train uniformed personnel for the United Nations Peacekeeping Operations (UNPKO).
- The exercise will prepare participants for future UN Peacekeeping missions, develop peace operations capabilities and enhance military readiness.
- The exercise includes Command Post Exercise (CPX), Field Training Exercises (FTX), combat discussions, lectures and demonstration.

Way Forward:

- The military exercise will enhance the level of defence co-operation between Indian Army and participating countries especially with the Mongolian Armed Forces which will enhance bilateral relations between the two countries.

INDIA GIFTS INDIGENOUSLY BUILT MISSILE CORVETTE 'INS KIRPAN' TO VIETNAM

Why in news?

- India gifted the indigenously-built in-service missile corvette INS Kirpan to Vietnam to enhance its naval capabilities.
- Indian Defence Minister announced this after bilateral talks with his visiting Vietnamese counterpart General Phan Van Gang.

Bilateral Cooperation:

- Both Ministers identified means to enhance existing areas of collaboration, especially in the field of defence industry cooperation, maritime security and multinational cooperation.
- Vietnamese Minister also visited headquarters of the Defence Research and Development Organisation (DRDO) and discussed ways to enhance "defence industrial capabilities by cooperation in defence research and joint production".

About INS Kirpan:

- INS Kirpan is a Khukri class missile corvette displacing 1,350 tonnes and was commissioned into the Navy on January 12, 1991.
- It has a displacement of close to 1,400 tonnes, a length of 91 metres, a beam of 11 metres and is capable of speed in excess of 25 knots.
- The ship is fitted with a medium range gun, 30 mm close range guns, chaff launchers and surface-to-surface missiles, according to the Navy.

Background:

- In June 2022, India and Vietnam signed an MoU on mutual logistics support.
- Both nations also signed the 'Joint Vision Statement on India-Vietnam defence partnership towards 2030'.
- It has procured 12 high speed patrol boats for the Vietnamese border guard force under a $100mn Line of Credit (LoC) extended in 2014.

ENVIRONMENT

FIVE MORE CHEETAHS TO BE STUDY REVEALS BUTTERFLIES BIOGEOGRAPHIC ORIGINS

Why in news?

- Recently, an international team of researchers sequenced 391 genes from nearly 2,300 butterfly species from 90 countries to help reconstruct a new phylogenomic tree of butterflies representing 92% of all genera.

Details:

- While the earlier classification was based more on butterfly morphology, the latest attempt has been based on genome sequencing. As a result, the researchers found that at least 36 butterfly tribes (above genus in taxonomical classification) require reclassification.

Key Findings:

- The work revealed that butterflies originated in the Americas in the late Cretaceous, about 100 million years after the origin of flowering plants.
- While butterflies dispersed from North America to Europe relatively quickly about 75 million years ago due to the landmass then being nearly contiguous, the dispersal from North America to Asia was through colder northern regions and happened around 60 million years ago.
- Both hostile climate and lack of contiguous landmass might have been the reasons why there was a lag in dispersal from North America to Asia.

Diversity across regions:

- Despite being its place of origin, North America largely being a temperate region has far less diversity compared with the tropical region in South America and Asia. Speciation is far higher in the tropics than the temperate region.
- Suitable climate that allows butterflies to live through the year, the greater diversity of habitats, and far higher diversity and absolute number of plant species that serve as source of food for butterflies serve as main drivers for higher speciation of butterflies in the tropics.

Dispersal:

- Like in most other animals, the dispersal of butterflies never followed a single direction.
- After initial dispersal of butterflies from temperate to tropical region, butterflies then dispersed from the tropics to the temperate region and vice versa in different butterfly groups that have evolved subsequently.
- Butterflies were present on all modern continental landmasses by Late Eocene (34 million years ago.

WORLD ENVIRONMENT DAY 2023 CELEBRATED WITH A THRUST ON MISSION LIFE

Why in news?

- The Ministry of Environment, Forest and Climate Change, Government of India organized the World

Environment Day on 5th June 2023 with a thrust on the Mission LiFE.

Concept of LiFE:

- The concept of LiFE, i.e., Lifestyle for Environment was introduced by the Prime Minister at the World Leaders' Summit in Glasgow at COP26, when he gave a clarion call to rekindle a global pursuit to adopt environment friendly lifestyles and practices.
- As a part of Mission LiFE, a comprehensive and non-exhaustive list of 75 individual LiFE actions have been identified across 7 themes – save water, save energy, reduce waste, reduce e-waste, reduce single-use plastics, adopt sustainable food systems, and adopt healthy lifestyles.
- The theme of World Environment Day 2023 is "Solutions to Plastic Pollution", a topic which aligns with one of the 7 themes of Mission LiFE: "Saying No to Single-use Plastics" and is also linked to implementation of a number of LiFE actions.

Two new Schemes:

- Prime Minister launched two schemes; Amrit Dharohar and MISHTI (Mangrove Initiative for Shoreline Habitats and Tangible Incomes) aimed at reviving the country's wetlands and mangroves.

Amrit Dharohar Yojana:

- India currently has 75 Ramsar sites that are wetlands of international importance and have been designated under the criteria of the Ramsar Convention on Wetlands.
- The country also accounts for about 3% of South Asia's mangrove population. Apart from the Sundarbans in West Bengal, the Andamans region, the Kachchh and Jamnagar areas in Gujarat have substantial mangrove cover.
- Acknowledging the importance of conservation of Ramsar Sites, the Government of India announced 'Amrit Dharohar' initiative as part of 2023 Budget announcement to promote the unique conservation values of Ramsar Sites.
- The launch of Amrit Dharohar Yojana will ensure the conservation of the existing Ramsar sites through public participation, and these sites will become the centre of eco-tourism and a source of green jobs for thousands of people.

MISHTI:

- Mangrove Initiative for Shoreline Habitats and Tangible Incomes was announced in the Union Budget 2023-24 to promote and conserve mangroves. Mangroves are unique, natural eco-system having very high biological productivity and carbon sequestration potential, besides working as a bio-shield.
- The Programme will cover approximately 540 sq km area across nine (9) coastal States and four (4) UTs in five years (2023-2028).
- It will create around 22.8 million man-days with estimated carbon sink of 4.5 million tons of Carbon. It will also create potential areas for nature tourism and livelihood potential for local communities.
- The primary objectives of the MISHTI scheme are sharing of best practices on plantation techniques, management practices, conservation measures and resource mobilisation through public-private partnership.
- The Centre will cover 80% of the project cost, while state governments will contribute the remaining 20%.

World Environment Day 2023:

- World Environment Day is the largest global event celebrated by millions on June 5.
- The event led by the United Nations Environment Programme (UNEP) was first celebrated on 5 June 1973, and this year marks its 50th anniversary.
- The 2023 theme for World Environment Day will focus on 'Solutions to Plastic Pollution' under the campaign #BeatPlasticPollution, encouraging worldwide activism.
- Côte d'Ivoire in partnership with the Netherlands hosted World Environment Day 2023 campaign event.

IISC RESEARCHERS DETERMINE CAUSE OF HEAVY FOAMING IN BELLANDUR LAKE

Context:

- The main culprit behind Bellandur Lake's excessive foaming is the high concentration of untreated sewage and industrial waste that flows into it.
- The researchers were surprised over the years is the fact that the foam counterintuitively increases only after heavy rains, which are supposed to dilute pollutants.

Highlights of new research:

- The team from the Centre for Sustainable Technologies (CST), Indian Institute of Science (IISc) has monitored the lake and collected water samples to analyse for various parameters, and recreated a lab model to track the changes in the chemical composition of the surfactants across different regions of the lake.
- They discovered that the untreated sewage takes 10-15 days to disperse through the lake. During this time,

a part of the organic material gets degraded in the absence of oxygen and settles down as sludge.

Foaming after rain:

- As more and more sewage flows through the lake, surfactants in the sewage do not decompose and instead get loosely attached to the settled sludge, gradually increasing in concentration.
- Meanwhile, the heavy rains bring large quantities of run-off from the city into the lake overnight and churn up the surfactant-laden sludge, dislodge the accumulated surfactant from the sludge, and bring it back into solution, making it ready to foam, and as the water level in the lake rises due to rains, the excess water containing large concentrations of the surfactants spills over into the lake's outlet to depths as high as 25 feet.
- The analysis also revealed that a single type of surfactant commonly used in most household washing powders and shampoos also plays a dominant role in driving this foaming.

Way Forward:

- They also suspects that certain bacteria might be responsible for foam formation and stability. However, they need more studies to establish it.
- The team from IISc highlighted the urgent need to stop the entry of untreated sewage into the lake and called for removing the accumulated sludge in the polluted lakes, at least before the rains, to prevent foaming.

PARTICULATE POLLUTION INCREASING IN RAJASTHAN'S CITIES, SAYS CSE REPORT

Why in news?

- Particulate pollution has been increasing in the cities of Rajasthan, which faces a multi-pollutant crisis with the levels of several gaseous pollutants such as nitrogen dioxide and ozone beginning to rise.
- This has increased public health risk in the State, an analysis report of the Centre for Science and Environment (CSE) has said.

Key Findings:

- The continuing elevated pollution levels among city stations highlight the systemic pollution which persists in the region because of inadequate infrastructure for pollution control across all sectors,.
- The particulate pollution was on the rise in Jaipur, Kota and Udaipur, where the average 2022 levels had crossed the pre-pandemic levels.
- Several cities exceed the standards for this category of pollution, while Jodhpur is the most polluted and Kota is the second among the five non-attainment cities in the State.
- Non-attainment cities are those which have fallen short of the National Ambient Air Quality Standards (NAAQS) for five years.
- The ground-level ozone, emerging as a challenge in non-attainment cities, needed more robust monitoring to assess risk. Ground-level ozone requires monitoring to assess its build-up in local situations across the landscape.

Long-term trends:

- The analysis has assessed long-term trends as well as seasonal variations in particulate and gaseous pollution in the State.
- Nitrogen dioxide pollution, closely linked with traffic flow, is on the rise in Jaipur, Jodhpur and Udaipur, as its level was 24% to 51% higher than was recorded in 2019.
- The nitrogen dioxide level had breached the annual standard in Jaipur in 2022, while Alwar and Kota had shown a stable trend.

Way Forward:

- It laid emphasis on the formulation of plans for massive clean energy transition in industry, transport, power plants and households.

INDIA TOPS GLOBALLY IN LEED ZERO CERTIFICATIONS OF GREEN BUILDING PROJECTS

Why in news?

- India ranks first globally in LEED Zero certified green building projects surpassing the US and China.
- In India, realty firm DLF and FMCG player ITC are leading in the LEED Zero green certification initiative.

Key Highlights:

- The US Green Building Council (USGBC) and Green Business Certification Inc (GBCI) said that India has

become a global leader in LEED Zero certifications, outperforming both the US and China.
- India has 73 LEED Zero certified projects, comprising 45 per cent of the more than 150 total LEED Zero certifications.
- Haryana and Tamil Nadu are leading the way in certifications.
- The US and China have the second and third most LEED Zero certifications, with 47 (30 per cent) and 15 (10 per cent) certifications, respectively.

Observations about India:
- India-based real estate developer DLF is the leader globally in total LEED Zero certifications with 45 certifications, followed by ITC Group with 15 certifications.
- While the private sector is helping India make strides in net zero certifications, nearly one-third of all carbon emissions in India come from the building and construction sector.
- The achievement is also in line with India's ambitious target of achieving net zero GHG emissions by 2070.

LEED Zero projects:
- LEED Zero recognises projects that have reached net zero or net positive status in the categories of carbon, energy, water, or waste.
- The LEED Zero projects, including office spaces, hospitality facilities, retail malls, industrial manufacturing projects, and data centres, serve a mix of sectors.
- To date, there are more than 35 million certified square feet of LEED Zero projects.
- USGBC works toward its mission of market transformation through its LEED green building programme, besides other activities.
- Established in 2008, GBCI exclusively administers project certifications and professional credentials and certificates within the framework of the USGBC's Leadership in Energy and Environmental Design (LEED) green building rating systems. It also manages other certifications.

CARNIVOROUS ALLIGATOR GAR, THE LATEST THREAT FOR SRINAGAR IDYLLIC DAL LAKE

Why in news?
- Recently, a non-native alligator gar fish, known for its crocodile-like head and razor-sharp teeth, was found in one of Kashmir's idyllic lakes, raising apprehensions about its impact on the native fish species.
- The rare, carnivorous fish was caught by the Jammu and Kashmir Lake Conservation and Management Authority (LCMA) during the routine deweeding process near Sher-e-Kashmir International Convention Centre (SKICC).

Key features:
- The alligator gar is a close relative of the bowfin species. It is a ray-finned euryhaline fish and is one of the biggest freshwater fish in North America and the largest species in the 'gar' family.
- presence of non-native fish species will spell doom for the eco-fragile flora and fauna of the waterbody.
- It is normally found in northern and central America and also in Mexico.
- But in recent years it was also found in some parts of India like Bhopal, Kerala and from the waterbodies of Maharashtra and Kolkata.

Threat:
- Being a predator fish and a carnivore, it can eat all types of fishes and therefore poses a threat to native species and to the overall ecosystem. For example, gar fish grows rapidly and has a life span of 20-30 years. It would kill all fingerlings of fish species already present in the waterbody and has a tendency to destroy natural aquatic life of Dal Lake.
- A total 12 native fish species are found in Dal and any exotic species can be dangerous to the indigenous fish species.
- Dal, along with the adjoining Nigeen lake, is a major source of fresh fish consumed by the people of Kashmir and outside.

Encroachment:
- Dal has already suffered extensively over the past four decades due to increasing encroachment, human interference and pollution.
- The lake, which is linked to the livelihood of thousands, has witnessed extreme loss in water quality, mainly because of anthropogenic pressures such as discharge of untreated sewage.
- Dal Lake has already shown the impacts of warming temperatures, variation in hydrological regime, excessive nutrient load and invasion of non-native species.

PM MODI TALKS OF MIYAWAKI FORESTS IN MANN KI BAAT

Why in news?
- Recently, the Prime Minister during his latest 'Mann ki baat' episode spoke about Miyawaki plantation, the

Japanese method of creating dense urban forests in a small area.

Examples:

- He also cited the example of a Kerala-based teacher, Raafi Ramnath, who used the Miyawaki technique to transform a barren land into a mini forest called Vidyavanam by planting 115 varieties of trees.
- Meanwhile, to fight climate change, curb pollution levels, and increase the green cover of the financial capital, the Brihanmumbai Municipal Corporation (BMC) has been creating Miyawaki forests in several open land parcels of Mumbai.

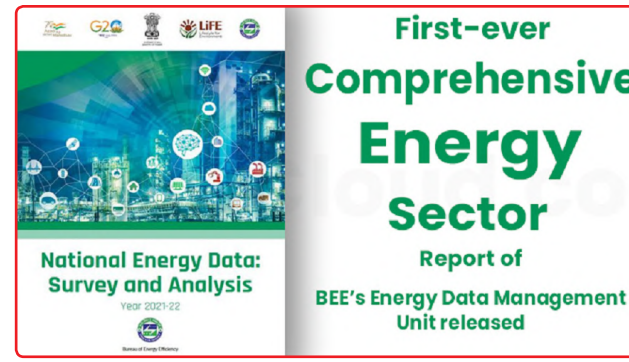
What is the Miyawaki plantation method?

- Named after Japanese botanist Akira Miyawaki, this method involves planting two to four different types of indigenous trees within every square metre. In this method, the trees become self-sustaining and they grow to their full length within three years.
- The methodology was developed in the 1970s, with the basic objective to densify green cover within a small parcel of land.
- The plants used in the Miyawaki method are mostly self-sustaining and don't require regular maintenance like manuring and watering.
- Over the years, this cost effective method has become the go-to solution for the civic body to restore the green cover in a space-starved city like Mumbai.

How is Miyawaki useful?

- The dense green cover of indigenous trees plays a key role in absorbing the dust particles of the area where the garden has been set up. The plants also help in regulating surface temperature.
- Some of the common indigenous plants that are used for these forests include Anjan, Amala, Bel, Arjun and Gunj.
- With several infrastructure projects like real estate metro rail construction in progress in Mumbai over the past few years, it was recorded that the surface temperature in certain pockets of Mumbai has increased. Therefore, to fight this challenge, such forests are being created.

FIRST EVER COMPREHENSIVE ENERGY SECTOR REPORT OF BEE ENERGY DATA MANAGEMENT UNIT RELEASED



Why in news?

- Recently, the Union Ministry of Power has come out with a comprehensive energy sector report titled 'National Energy Data: Survey and Analysis 2021-22'.
- It is the maiden report of Energy Data Management Unit, set up under Bureau of Energy Efficiency, Ministry of Power.

Details:

- It provides granular information about energy supply and consumption patterns across various sectors of the Indian economy.
- The report contains extensive data compiled for the last six years, i.e., from FY 2016-17 to FY 2021-22, along with trends and analysis of fuel-wise energy consumption in major end-use sectors.
- It also provides an overview of the impact of various energy conservation policies and their associated carbon dioxide emission reduction and monetary savings.
- It has been prepared by Ministry of Power through Bureau of Energy Efficiency in collaboration with NITI Aayog, various line Ministries and Departments, institutions, and other stakeholders.

Key Highlights:

Value Addition

- This report provides granular fuel-wise energy consumption data for various sectors. This detailing will enable a better understanding of the energy profile of various sectors, sub-sectors and consumer groups.
- The use of distinct conversion factors (of domestic coal and imported coal) for different years based on different calorific values of coal gives a realistic picture of coal-based energy supply and consumption in the country.
- In the latest edition of 2023 Report of Ministry of Statistics & Programme Implementation, the conversion factors of coal have been derived using a weighted average methodology rather than using a single representative GCV for all grades of coal.

- It also provides an overview of the impact of various policies on energy savings and CO2 emission reduction with corresponding monetary savings.

New Insights:

- Energy supply to economy during last six years is actually less by 18%; this has been found out by using Indian coal conversion factors, rather than IEA conversion factors which has been used before
- Lower energy consumption value by 8% in 2021-22.
- Increased share of electrification on consumption side to 20.9%.

Way Forward:

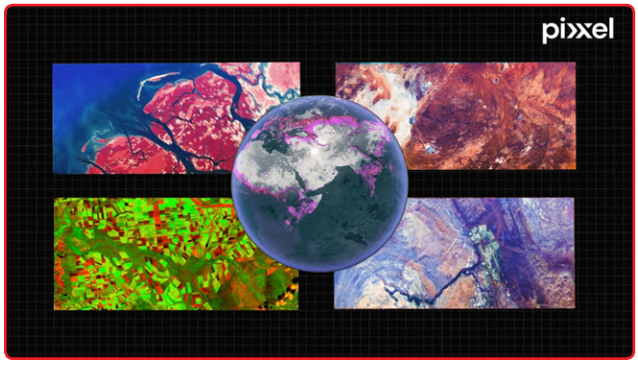
- The information provided in this report will help in assessing the status of data availability of various energy products in the country.
- It can also help in analysing energy intensity of the country thereby enabling policy makers to formulate robust policies and carry out course corrections.

SCIENCE & TECHNOLOGY

GOOGLE INVESTS IN INDIA'S PIXXEL TO LAUNCH HYPERSPECTRAL SATELLITE CONSTELLATION

Why in news?

- India's first private company to launch a satellite into space, Pixxel has raised $36 Million in fresh funding as it plans to build the world's first and highest-resolution hyperspectral satellite constellation.
- The Series B funding comes from Google along with existing investors Radical Ventures, Lightspeed, Blume Ventures, GrowX, Sparta, and Athera.



What it holds for Pixxel?

- It will also help further the development of Aurora: Pixxel's AI-powered analytics platform to make hyperspectral analysis accessible for everyone. It plans to deliver actionable climate insights on a planetary scale with its satellite constellation.
- The new investment will boost the company's plans to launch 6 satellites in 2024 and 18 other satellites by 2025.

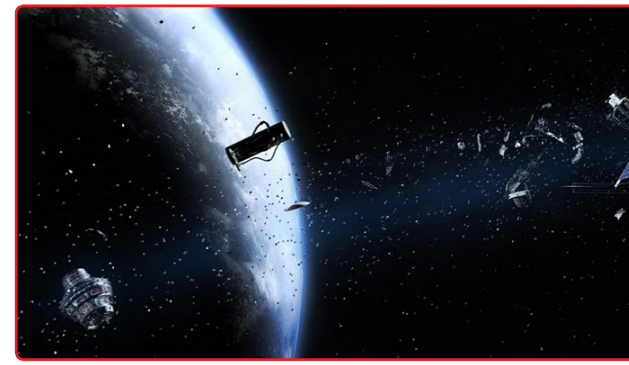
HSI constellations:

- The fresh round of funding comes against the backdrop of a five-year contract from the US National Reconnaissance Office to provide hyperspectral imagery.
- The company will use on-orbit pathfinder systems and future HSI constellations to collect and provide the data, which will contribute to world-class intelligence, surveillance, and reconnaissance capabilities.
- The hyperspectral satellites can capture images at hundreds of wavelengths in the electromagnetic spectrum and reveal key data about the health of the planet.

Way Forward:

- Both the hyperspectral constellation and advanced data analytics platform will provide up to 10 times more information compared to today's multispectral satellites in space and increase the spectral resolution available by 50x.

UN RECOMMENDS NEW TREATY TO ENSURE PEACE & SECURITY IN OUTER SPACE



Why in news?

- The United Nations (UN) has recommended a new treaty for ensuring peace and security as well as preventing an arms race in outer space.
- The negotiations should lead to the development of international norms, rules and principles to address threats to space systems, according to a UN policy brief, 'For All Humanity —The Future of Outer SpaceGovernance'.
- It recommended "a combination of binding and non-binding norms" to address emerging risks to outer space security, safety and sustainability.

Increasing space missions:

- The number of satellite launches has shot up exponentially in the past decade after it stayed consistent from 1957-2012. In 2013, there were 210 new launches, which increased to 600 in 2019 and 1,200 in 2020 and 2,470 in 2022.
- This increase is fuelled by the active participation of the private sector. Though the private sector is more

active in the United States, China, India and Japan are catching up.

- NASA, through its Artemis mission, plans to land the first woman and the next man on the Moon, marking the return of humans to outer space after more than 50 years. Europe, India and Japan are also making progress in developing heavy rockets and human-rated vehicles.
- Minerals on the Moon, asteroids and planets can be attractive for countries. Moon, for example, has rich deposits of helium-3, which is rare on Earth.
- Similarly, asteroids contain abundant deposits of valuable metals, including platinum, nickel and cobalt. Some governments are in favour of the exploitation of space resources, including by the private sector.

Challenges:

- Currently, there is no agreed international framework on space resource exploration, exploitation and utilisation, or a mechanism to support how it is implemented, the brief noted.
- Currently, space traffic is coordinated by national and regional entities. Each has its own standards, best practices, definitions, languages and modes of interoperability. A lack of coordination among the entities could impact countries with less space capacity. They might find it hard to operate with limited space assets.
- Space debris is another issue. More than 24,000 objects which are 10 centimetres or larger, about one million smaller than 10 cm and likely more than 130 million smaller than one cm have been recorded.
- Further, the UN has called for additional frameworks to prevent an armed conflict in outer space and the weaponisation of outer space.
- Any satellite is capable of manoeuvring purposefully into another and destroying it. This would significantly increase the potential for space debris and the compromising of critical civilian infrastructure, disrupting communications, observation and navigation capabilities vital to the global supply chain.

Recommendations:

- In addition to a new treaty, the UN recommended an effective framework for coordinating space situational awareness, space object manoeuvres and space objects and events. They also urged member states to develop norms and principles for space debris removal that consider the legal and scientific aspects of space debris removal.
- As for space resource activities, they propose an effective framework for sustainable exploration, exploitation and utilisation of the Moon and other celestial bodies.

Existing treaties:

- In 1959, the United Nations established the Committee on the Peaceful Uses of Outer Space to review and enable international cooperation in the peaceful uses of outer space.
- In 1963, countries agreed to prohibit testing nuclear weapons in outer space; in 1977, the prohibition of altering the space environment as a weapon was agreed upon.
- More recently, member states have set up a series of guidelines, frameworks and recommendations on issues such as mitigation of space debris, nuclear power source safety, the long-term sustainability of outer space activities and transparency and confidence-building measures in outer space activities.

Way Forward:

- The recommendations come ahead of the UN Summit of the Future, which will be held on September 22-23, 2024, in New York.
- At the Summit of the Future, member states will agree on multilateral solutions for a better tomorrow and to strengthen global governance.

SATELLITES IN DANGER, RISK OF COLLISION HIGH AS EARTH'S ATMOSPHERE HEATS UP

Why in news?

- Satellites in orbit are crucial for the day-to-day functioning of the planet, but they are also the most vulnerable due to geomagnetic storm.
- The increased solar activity with several geomagnetic storms pummeling the planet, the Earth's atmosphere is heating up. The geomagnetic storms from the Sun have infused several terawatts of energy into Earth's upper atmosphere and the temperature is going up.

What is geomagnetic storm?

- A geomagnetic storm is a disturbance in Earth's magnetic field caused by the arrival of a CME's charged particles.
- When these particles interact with Earth's magnetic field, they can cause all sorts of electrical and magnetic disruptions. Coronal mass ejections, or CMEs, are massive bursts of plasma and magnetic fields that are released from the Sun's corona.

Impact:

- Once a CME is released, it travels through space, interacting with the solar wind and the magnetic fields of other planets. As it approaches Earth, the CME can cause a disturbance in our planet's magnetic field, creating a geomagnetic storm.
- While the extra heat has no effect on the planet's climate, it could affect the satellites in Low Earth Orbit.
- The impact of a CME on Earth depends on a variety of factors, including the speed and direction of the CME, as well as the strength and orientation of the CME's magnetic fields. If the CME is directed towards Earth and its magnetic fields are aligned with Earth's, then the impact can be more severe.

Solar Cycle:

- Earth has been hit by repeated bouts of such geomagnetic storms in the last few months as the activity on the Sun ramps up. The solar cycle is a natural phenomenon that occurs due to the Sun's magnetic field.
- The solar cycle has two distinct phases: the solar maximum and the solar minimum and currently the Sun is approaching the maximum phase, which has led to the development of more sunspots on the surface leading to more ejections.

CENTRE TO COMPLETE 3D DIGITISATION OF MUSEUMS BY YEAR-END

Why in news?

- The Union government plans to complete 3D digitisation of all museums under its administrative control by 2023-end for better conservation of artefacts.

Details:

- They include the Salar Jung Museum, Hyderabad, the Allahabad Museum in Prayagraj, the Indian Museum, Kolkata, the Victoria Memorial Hall, the National Museum and the National Gallery of Modern Art.
- The Culture Ministry has 10 museums within its ambit, including those mentioned above. Apart from these, the Archaeological Survey of India has site museums at 44 locations spread throughout the country in proximity to key archaeological sites.

Significance:

- Besides aiding conservation, 3D digitisation of the museums can offer visitors new ways to access and explore the collection. 3D models can be used in augmented reality and virtual reality learning experiences, and facilitate 3D printing.
- The digitisation process involves 3D scanning which means analysing a real-world object or environment to collect three-dimensional data of its shape and possibly its appearance. The collected data is then used to construct digital 3D models.

Implementation:

- The entire process was being carried out by the Ministry of Electronics and Information Technology.
- The 3D digitisation would be done using the JATAN virtual museum builder software, which has been designed by Human Centres Design and Computing Group, Centre for Development of Smart Computing, Pune.
- JATAN is a client server application with features such as image cropping, watermarking, unique numbering, management of digital objects with multimedia representations.
- It can create 3D virtual galleries and provide public access through web, mobile or touchscreen kiosks.

INDIA'S AZISTA BST AEROSPACE LAUNCHES 1ST RUNNER SATELLITE

Why in news?

- India's Azista BST Aerospace launched its first satellite, ABA First Runner (AFR), onboard the SpaceX Falcon 9 rocket as part of the Transporter-8 Mission.
- The company aims to make India a hub for the mass manufacturing of satellites and the successful mission puts it on the path.

Details:

- The satellite lifted off from Space Launch Complex 4E at Vandenberg Space Force Base in California on Musk's SpaceX rideshare mission.
- There were 72 spacecraft, including CubeSats, MicroSats, a re-entry capsule, and orbital transfer vehicles on the rocket alongside India's AFR.

Salient features:

- The 80-kilogram satellite was built on a modular bus platform and hosts a wide-swath optical remote sensing payload with both panchromatic & multispectral imaging capabilities.
- AFR represents the first satellite of its size and performance built by the private space industry in India, capable of supporting various critical applications for civilian and defense purposes

What's next?

- Azista BST Aerospace, the Ahmedabad-based company claims to have a production capacity of at least two satellites per week at its 50,000-square-foot facility.
- It is working to develop the next set of satellites to demonstrate its capabilities with versatile payloads with its modular satellite buses and that Several of these satellites will be launched within the next two years.

SCIENTISTS DISCOVER DUCK-BILLED DINOSAUR ROAMED CHILE 72 MILLION YEARS AGO

Why in news?

- A duck-billed herbivorous dinosaur roamed the ancient and remote river plains of Patagonia in southern Chile some 72 million years ago, a new study recently revealed.

Why name Gonkoken nanoi?

- Gonkoken is a combination of two words from the Aonikenk language. 'Gon' means similar or similar to and 'koken' means wild duck or swan.
- The indigenous Aonikenk people inhabited Patagaonia until the end of the 19th century.
- While 'nanoi' is in recognition of Mario 'nano' Ulloa, a former ranch keeper who provided the team with logistical support during the first discoveries.

Key features:

- Scientists have dubbed the dinosaur Gonkoken nanoi.
- It weighed up to a metric ton and could grow to 4 meters (13.12 feet) in length.
- Gonkoken nanoi is not an advanced duck-billed dinosaur, but rather an older transitional duck-billed lineage: an evolutionary link to advanced forms.

Background:

- In 2013, an expedition led by the Chilean Antarctic Institute (INACH) discovered fragments of yellowish bones at the bottom of a hillside close to the major tourist destination Torres del Paine in Patagonia. This kicked off an almost decade-long investigation.
- The extensive research allowed scientists to digitally reconstruct the skeleton and the team is hoping to 3D print it to display it to the public.

OMICRON SPECIFIC MRNA BASED BOOSTER VACCINE DEVELOPED INDIGENOUSLY

Why in news?

- The Department of Biotechnology (DBT) has announced that the Omicron-specific mRNA-based Booster vaccine developed using the indigenous platform technology by Gennova Biopharmaceuticals Ltd.

Details:

- It was supported under the Mission COVID Suraksha, implemented by Biotechnology Industry Research Assistance Council (BIRAC).
- It has got a nod from the office of the Drug Control General of India (DCGI) for Emergency Use Authorization (EUA).
- DBT has facilitated establishing Gennova's mRNA-based next-generation vaccine manufacturing for developing the platform technology from proof of concept till Phase I clinical trial of the prototype mRNA-based vaccine developed against the Wuhan strain.

GEMCOVAC®-OM:

- GEMCOVAC®-OM is an Omicron-specific mRNA-based Booster vaccine developed using the indigenous platform technology by Gennova in collaboration with DBT.
- Like the prototype vaccine, GEMCOVAC®-OM is a thermostable vaccine, which does not require ultra-cold chain infrastructure used for other approved mRNA-based vaccines, making it easy for deployment pan India.
- It is delivered intra-dermally using a needle-free injection device system.

- When administered intradermally in participants as a booster, it generated significantly higher immune responses. The clinical outcome demonstrates the need for variant-specific vaccines for desired immune response.

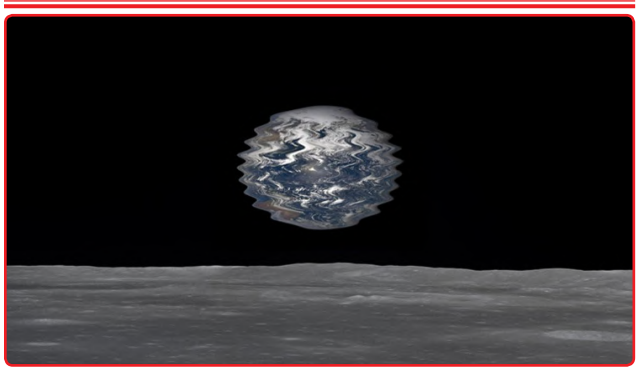
About DBT

- The Department of Biotechnology (DBT), under the Ministry of Science & Technology, promotes and accelerates the development of biotechnology in India, including the growth and application of biotechnology in the areas of agriculture, healthcare, animal sciences, environment, and industry.

About BIRAC:

- Biotechnology Industry Research Assistance Council (BIRAC) is a not-for-profit Section 8, Schedule B, Public Sector Enterprise, set up by the Department of Biotechnology (DBT), Government of India, as an Interface Agency to strengthen and empower the emerging Biotech enterprises to undertake strategic research and innovation, addressing nationally relevant product development needs.

SCIENTISTS FIND LINK BETWEEN SURGES OF COSMIC RADIATION FROM SPACE AND EARTHQUAKES



Why in news?

- Scientists have identified a striking link between earthquakes and changes in the intensity of cosmic radiation measured on Earth's surface, according to a recent study.
- This correlation could aid in earthquake prediction by up to two weeks, however, the ability to predict specific locations remains unclear at present.

Key Highlights:

- Cosmic ray data shifted 15 days forward relative to seismic data can help predict earthquakes, according to researchers from the Institute of Nuclear Physics of the Polish Academy of Sciences (IFJ PAN) in Krakow, Poland.
- The researchers looked into verifying a previously known hypothesis that earthquakes could potentially be predicted by observing changes in cosmic radiation.

CREDO Project:

- IFJ PAN started the Cosmic Ray Extremely Distributed Observatory (CREDO) project in 2016, an international, virtual cosmic ray observatory accessible to all.
- It aggregates and processes data from numerous detectors, including particular smartphone sensors transformed into cosmic ray detectors via a simple app.
- A fundamental responsibility of CREDO is to track worldwide alterations in the flux of secondary cosmic radiation that reaches our planet's surface. This radiation primarily originates in the planet's stratosphere.

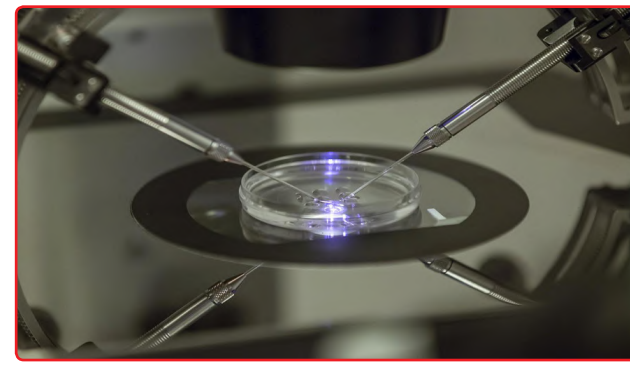
Key Findings:

- Earth's magnetic field, a result of eddy currents in Earth's liquid core, alters the trajectory of primary cosmic radiation's charged particles.
- Any substantial earthquakes linked to disturbances in the Earth's dynamo flows would alter the magnetic field of Earth, thus impacting the path of primary cosmic radiation. The fallout of these alterations would be apparent in the changes in the counts of secondary cosmic ray particles recorded by ground-based detectors.
- However, correlations between changes in cosmic ray intensity and earthquakes are not apparent in location-specific analyses. They only appear when seismic activity is taken into account on a global scale.

Way Forward:

- The discovery has led to intriguing questions about the potential influence of phenomena like dark matter streams.

NEW ART REGULATIONS PUSH UP COST OF TREATMENT, LIMIT CONCEPTION OPPORTUNITIES



Why in news?

- The Health Ministry had notified the Assisted Reproductive Technology Regulations (ART), 2023, which are aimed at providing donors and patients with better medical care and security earlier this year.

Key Highlights:

- The new ART provisions impose restrictions on the number of times a donor, male or female, can donate (sperm/oocyte) in their lifetime, and specifies age limits for donors.
- The provision states that an oocyte donor should be a person who have been married at least once in their lives and have at least one living child of her own (minimum three years of age). She can donate oocyte only once in her lifetime and not more than seven oocytes can be retrieved.
- An ART bank cannot supply gamete (reproductive cell) of a single donor to more than one commissioning couple (couple seeking services).
- The parties seeking ART services will be required to provide insurance coverage in the favour of the oocyte donor (for any loss, damage, or death of the donor).
- A clinic is prohibited from offering to provide a child of pre-determined sex. Also checking for genetic diseases before the embryo implantation is needed.
- While welcoming the safety measures and transparency the new provisions bring, Archna Dhawan Bajaj, gynaecologist, Nurture IVF, said that the restrictions significantly limit the opportunities for ART couples to find suitable donors.

Concerns:

- The new provisions have pushed up the already sky-high medical costs and are proving to be a challenge for treating doctors and couples wanting to have children through ART because of the restricted and limited resource availability in terms of donors.
- Overall, the new ART laws are restricting the number of donation attempts. They have the potential to increase costs and create challenges for couples relying on assisted reproductive techniques.
- India is facing a dip in fertility rates and further limiting available donors is likely to bring in more challenges.

THE ROLE OF THE Y CHROMOSOME IN CANCER OUTCOMES STUDIED

Why in news?

- Two studies have recently shed light on the role of the Y chromosome in cancer outcomes, in which males are often more adversely affected than females.

Role of Y chromosome:

- Sex is known to affect cancer incidence, clinical outcomes and tumour biology, with most cancers causing worse outcomes in males than in females. Some studies have suggested that the function of the Y chromosome may have a role.
- One paper identified an upregulated gene on the Y chromosome that contributes to colorectal cancer in mice by driving tumour invasion and aiding immune escape in males.
- The other study demonstrated how the loss of the Y chromosome in bladder cancer generates a more immunosuppressive tumour microenvironment and contributes to worse outcomes.

Key Highlights:

- Researcher from the University of Texas MD Anderson Cancer Center assessed sex differences in colorectal cancer in a mouse model of the disease.
- Colorectal cancer is the second most common cause of cancer-related deaths, which is more aggressive and metastatic in males.
- The model is a specific form of the disease, driven by a known oncogene called KRAS. The researchers observed a higher frequency of metastasis and worse survival in male mice, mirroring the outcomes seen in humans.
- Analyses reveal upregulation of a gene for an enzyme which drives tumour invasion and immune escape.
- This gene is expressed on the Y chromosome, thereby providing a potential basis for sex-specific differences in the progression of KRAS-driven colorectal cancer.

Loss of the Y chromosome:

- In another study, researchers from Cedars-Sinai Medical Center, Los Angeles and colleagues investigated how the loss of the Y chromosome might affect cancer outcomes.
- Loss of the Y chromosome is a feature observed in multiple cancer types.
- They first looked at clinical data from 300 male patients with bladder cancer to identify an association between Y chromosome loss and poor prognosis.
- They studied bladder cancer cell lines and found that tumours lacking the Y chromosome were more aggressive and had a dampened T cell-mediated immune response compared with tumours which had the Y chromosomes intact.
- They loss of the Y chromosome is associated with an increased response to a specific type of immunotherapy called anti-PD1 checkpoint blockade therapy in both mice and humans, suggesting a potential treatment for this subset of bladder cancers.

SOCIAL ISSUES

UNDP PARTNERS WITH DAY NULM TOWARDS EMPOWERING WOMEN ENTREPRENEURS

Why in news?

- Recently, the United Nations Development Programme (UNDP) and the Deendayal Antyodaya Yojana-National Urban Livelihoods Mission (DAY-NULM) entered into a collaborative partnership aimed at empowering women to make well-informed career choices in the field of entrepreneurship.

Key Highlights:

- The partnership will provide support for women looking to start and expanding their own enterprises, particularly in sectors such as care economy, digital economy, electric mobility, waste management, food packaging and more.
- Focused on fostering entrepreneurship development and accelerating enterprise growth, the three-year project, extendable beyond 2025, will cover eight cities in the initial phase.

Women entrepreneurship:

- Women entrepreneurship is a proven strategy for poverty alleviation, financial independence, and reshaping gender norms.
- Today, women account for only 15 percent of the total entrepreneurs in India.

How UNDP and DAY-NULM collaboration will help?

- Leveraging its experience in linking over 2,00,000 women to better employment opportunities, UNDP will offer national-level capacity building support to DAY-NULM.
- This support will focus on knowledge generation and management, such as compiling compendiums of best practices related to urban poverty, to enhance the implementation of national-level schemes.
- UNDP and DAY-NULM will jointly engage in on-ground mobilization activities that involve identifying pockets of urban poverty and potential entrepreneurs, as well as facilitating access to Business Development Services.
- UNDP will also contribute to the initiative by developing community business mentors called Biz-Sakhis in selected project locations. These mentors, who possess valuable business knowledge, can support new and existing enterprises, and serve as a resource for DAY-NULM at a later stage.

DAY-NULM:

- The DAY-NULM has an aim to uplift the urban poor by enhancing sustainable livelihood opportunities through skill development. The scheme extends its coverage to all the 4,041 statutory cities and towns, thereby covering most of India's urban population.
- Through its outreach efforts, DAY-NULM has mobilized more than 8.4 million urban poor women across India, forming over 8,31,000 Self-Help Groups (SHGs) in over 4,000 towns.
- Their impressive grassroots initiatives facilitate economic empowerment and amplifies the voices of marginalized sections of the urban population, including SCs/STs, minorities, female-headed households, street vendors, and rag pickers.

UNION GOVT. MOOTS NEW HDI FOR 28 LAKH VULNERABLE TRIBALS

Why in news?

- The Union government is now looking to design a survey that can gauge the Human Development Index (HDI) specifically for about 28 lakh people of the Particularly Vulnerable Tribal Groups (PVTGs) living in over 22,000 villages across the country.

Key Highlights:

- It is part of PM-PVTG programme that the survey to create an HDI for PVTGs will be conducted.
- The Tribal Affairs Ministry will collect information about the changes in their lives and document it and simply put, make a database from it at the village-level.
- This will also be able to quantify how government policies are changing their lives.

Pradhan Mantri Primitive Vulnerable Tribal Groups (PM-PVTG) Development Mission:

- Finance Minister Nirmala Sitharaman had in 2023 Budget speech announced a ₹15,000-crore expenditure

outlay for the Pradhan Mantri Primitive Vulnerable Tribal Groups (PM-PVTG) Development Mission, to be spent over the next three years.
- The programme envisions connecting all 22,544 PVTG villages to basic government services like communications, electricity, public education, healthcare, water supply, and connectivity.
- It will saturate PVTG families and habitations with basic facilities and stressed on education for PVTG's.

Way Forward:
- It is the first time a special scheme for PVTGs has been formulated to have holistic development with a data centric human development indexing for the PVTG groups.

HEALTH

AMEND LAW TO MAKE NECROPHILIA AN OFFENCE, SAYS HC

Why in news?
- Observing that the attendants appointed to guard the bodies in mortuaries of many government and private hospitals indulge in "sexual intercourse" on the bodies, the High Court of Karnataka has recommended that the Union government amend the Indian Penal Code (IPC) to bring necrophilia under the definition of offence of unnatural sex or introduce new provision in IPC to make necrophilia an offence.

Details:
- In the United Kingdom, Canada, New Zealand, and South Africa necrophilia is an offence under the law.
- In India no specific legislation is enacted, including under the provisions of IPC for the purpose of upholding dignity and protecting rights and crime against the body of the woman.

Case before HC?
- A Division Bench passed the order while acquitting Rangaraju from the charges of raping a 25-year-old woman after murdering her. The trial court in Tumakuru had convicted him for murder and sexually assaulting her body after murdering her.
- Though the High Court confirmed his conviction for murder, it set aside the conviction on the charges of rape while pointing out that the act of sexual assault on the dead body cannot be termed as rape under Sections 377 (unnatural sex) and 376 (rape) the IPC.
- Unfortunately these provisions of the IPC do not include the term 'dead body,' the Bench said while pointing out that necrophilia does not attract the provision of rape under Section 376 of IPC.

Guidelines issued by HC:
- Meanwhile, the Bench directed the State government to ensure CCTV cameras are installed, mortuaries are regularly cleaned so that body is preserved in a proper manner to maintain its dignity and that staff of mortuary are sensitised to handle bodies with care in the mortuaries of all the government and private hospitals, to prevent offence against dead, particularly of women, within six months.
- The postmortem room should not come under the direct line of sight of the general public/visitors for maintaining privacy; and mortuaries should have all basic infrastructure as per the Indian Public Health Standard guidelines for the district hospitals for management of the bodies.

Way Forward:
- It is high time the Union government, in order to maintain right to dignity of the dead person/woman, amend the provisions of Section 377 of IPC to include body of any man, woman or animal or introduce a separate provision as offence against dead woman as necrophilia or sadism" as has been done in other countries to ensure dignity of the dead person including woman.

IITR DEVELOPS HAEMOGLOBIN SELF TEST KIT THAT GIVES RESULT IN 30 SECONDS

Why in news?
- Recently, the CSIR-Indian Institute of Toxicology Research (IITR) has come up with an indigenous innovative rapid haemoglobin detection test kit called SenzHb, a paper-based kit that gives results in just 30 seconds.

Details:
- The traditional methods for getting haemoglobin checked involve sophisticated instruments and

clinical laboratory settings that are often unavailable in remote/rural areas.
- This paper-based, colorimetric strip-type sensor of SenzHb addresses these challenges by providing a rapid and reliable haemoglobin assay.
- It costs just Rs 10 for a test.

How it works?

- All one needs to do is prick with the help of a needle that comes with the strip, drop blood on the strip and as soon the strip colour changes, match it with the 'changed colour guidelines' given along with the kit. The results can help one know if he or she is anaemic or not.
- This kit incorporates a QR code that provides detailed instructions for conducting the test in eight languages. The QR code also includes a colour chart, further simplifying the interpretation of results.
- To ensure the accuracy and reliability of SenzHb, extensive validation has been conducted.

Way Forward:

- It is a point-of-care test (POCT) kit that can be used by healthcare workers, even in the absence of advanced laboratory facilities.
- Its simplicity and user-friendly design enables efficient and accurate haemoglobin estimation.

MONKEYPOX OUTBREAKS IN ASIA PACIFIC REGION

Why in news?

- Recently, the World Health Organization (WHO) declared the Mpox, the global health emergency over.
- Even though cumulative cases across the world continue to decline, there has been an increase in reported cases from some countries, particularly in Southeast Asia and the Western Pacific Region.

What is monkeypox?

- Monkeypox, or Mpox, is a viral disease that primarily spread to the human population through zoonotic spillovers, with rodents and primates serving as potential reservoirs.
- Mpox can be transmitted between humans through close contact and exposure to infected bodily fluids or lesions.
- Sexual contact is also believed to contribute to the spread of the disease particularly among certain demographics.
- Mpox was a rare infection that was predominantly restricted to some countries in Africa until early 2022, when a rise in cases across the globe where the disease was not endemic, particularly in Europe and North America.
- According to WHO, over 87,000 cases of Mpox have been reported to date since January 2022, including 146 deaths.

Global situation update:

- In recent weeks, overall global cases of Mpox have been decreasing, but some regions are seeing an increase in reported cases. In the European region, new cases have been reported from Spain and the U.K.
- The global situation of Mpox is far from being resolved, with an increasing number of reports from new countries. Significant impacts observed in Southeast Asia and Western Pacific region.
- In June 2023, China reported four cases of Mpox raising concerns about the spread of the disease in the country. Two cases were also reported from Sri Lanka, in patients who had a travel history to Dubai.
- Mpox being reported from newer territories is worrisome as the disease is potentially expanding its reach through an undetected spread, posing new challenges in its containment efforts.

Cause for concern:

- The lack of a corresponding surge in reported cases suggests that there may be challenges in accurately capturing and documenting cases in the Middle East, suggesting that there may be challenges in detecting cases in the region.
- Meanwhile, the African region has also experienced a surge in cases, notably in Cameroon, the Democratic Republic of the Congo, and Nigeria.
- Genomic surveillance of the monkeypox pathogen allows for contact tracing and monitoring of its evolution. There is a noticeable lack of genomic data from developing countries, particularly in Asia.

Way Forward:

- Moving forward from the global pandemic, it is crucial to remain vigilant and prepared for future challenges, taking proactive measures to curb infections and protect vulnerable populations.

9TH EDITION OF INTERNATIONAL DAY OF YOGA 2023

Why in news?

- The 9th edition of International Day of Yoga 2023 was celeberated on 21st June.
- The main National event at Jabalpur, Madhya Pradesh saw enthusiastic participation of more than

15,000 people, who participated in the Common Yoga Protocol (CYP) demonstration in presence of Vice President of India.
- In 2023, the Prime Minister he will lead an IDY event at UN headquarters in New York.

Theme:
- The theme of International Yoga Day 2023 was "Yoga for Vasudhaiva Kutumbakam", which also represents as "One Earth, One Family, One Future."

Ocean Ring of Yoga:
- The highlight of 9th International Day of Yoga was unique concepts of creation of Ocean Ring of Yoga.
- Nearly 3500 naval personnel onboard 19 Indian Naval ships travelled over 35,000 Km as ambassadors of Yoga in both national and international waters. This includes over 2400 personnel on 11 IN ships at foreign ports/international waters.
- Notably, IDY was celebrated onboard ships of several foreign Navies in concert with our overseas Missions, involving over 1200 foreign Navy personnel.

Yoga from Arctic to Antarctica:
- Yoga from Arctic to Antarctica was another facet where Yoga demonstration was organized in countries falling in and around Prime Meridian line and on North Pole and South Pole regions.
- Scientists/Researches at India's research bases in Arctic and Antarctica namely Himadri and Bharati also participated in Yoga demonstration.
- Indian Army, Indian Navy, Indian Air Force along with ITBP, BSF, and BRO made a chain of Yoga demonstration in unison named Yoga Bharatmala.
- Similarly yoga demonstration along Indian coast line and islands termed Yoga Sagarmala was also formed.

Har Aangan Yoga:
- For engaging with rural communities Ministry of Ayush had elaborately planned to spread message of "Har Aangan Yoga".
- Yoga demonstration was organized at Panchayats, Anganwadi, Health and Wellness Centres, and schools, around 2 lakhs common service centres, Ayush Gram Unit and location around Amrit Sarovar.

International Day of Yoga:
- The idea of International Day of Yoga (IDY) was proposed by India during the opening of the 69th session of the United Nations General Assembly (UNGA), held in 2014.
- The UN proclaimed 21st June as IDY by passing a resolution in December, 2014.
- The first Yoga Day celebrations in 2015 at Rajpath in New Delhi created two Guinness World Records.

JOHA RICE, THE NUTRACEUTICAL OF CHOICE IN DIABETES MANAGEMENT

Why in news?
- The scientists at the Institute of Advanced Study in Science and Technology (IASST), has explored the nutraceutical properties of aromatic Joha rice.

Joha rice:
- Joha rice, aromatic rice cultivated in the Northeastern region of India is effective in lowering the blood glucose and preventing diabetes onset and hence is an effective nutraceutical of choice in diabetes management.
- Joha is a short-grain winter paddy known for its significant aroma and noteworthy taste.
- The traditional claims are that the consumers of Joha rice have low incidence of diabetes and cardiovascular diseases, but these needed scientific validation.

Nutraceutical properties of aromatic Joha rice:
- Through in vitro laboratory analysis, they detected two unsaturated fatty acids viz., linoleic acid (omega-6) and linolenic (omega-3) acid. These essential fatty acids (which human cannot produce) can help maintain various physiological conditions.
- Omega-3 fatty acid prevents several metabolic diseases such as diabetes, cardiovascular diseases, and cancer.
- Joha has also proved to be effective in lowering the blood glucose and preventing diabetes onset in diabetic rats.
- The scented Joha rice has a more balanced ratio of omega-6 to omega-3 in comparison to the widely consumed non-scented variety. The ratio of omega-6 to omega-3 essential fatty acids (EFA) of required by human beings for maintaining the proper diet is around one.

- They have used this Joha rice to make rice bran oil, a patented product that they claim to be effective in diabetes management.

Bioactive compounds:

- Besides, Joha rice is also rich in several antioxidants, flavonoids, and phenolics.
- Some of the reported bioactive compounds are oryzanol, ferulic acid, tocotrienol, caffeic acid, catechuic acid, gallic acid, tricin, and so on, each with reported antioxidant, hypoglycaemic and cardio-protective effects.

CULTURE

ARCHAEOLOGIST FINDS MESOLITHIC ERA ROCK PAINTING IN ANDHRA'S GUNTUR

Why in news?

- A Mesolithic period rock painting depicting a person tilling a piece of land has been found in Orvakallu village in Guntur district, Andhra Pradesh.

Details:

- While surveying the lower River Krishna Valley to ascertain the architectural features of shrines, a new prehistoric rock painting on the walls and ceiling of natural rock shelters on a hillock at Orvakallu was identified.
- After an intensive exploration, it was noticed that these were shelters for prehistoric humans who lived at this place.

Key Findings:

- Among these five naturally formed caves, two are embellished with distinguished depictions of rock paintings on the back walls and ceilings executed by people of Mesolithic Age, roughly from 5000 BC.
- The paintings were made with "natural white kaolin and red ochre pigments", as well as that most of them had been "badly damaged" due to exposure to "air and wind".
- Ochre is a pigment composed of clay, sand, and ferric oxide. Kaolinite is a soft, earthy, and usually white mineral produced by the chemical weathering of aluminium silicate minerals like feldspar.

Significance:

- The find throws light on aspects of the social life and culture of the people who lived in the area.
- One of the paintings depicted a man catching wild goat with his left hand while wielding a hook-like implement to control it. Another showed two couple standing with their hands raised while a child stood behind them.

MISCELLANEOUS

WRITER ARUNDHATI ROY RECEIVES EUROPEAN ESSAY PRIZE FOR LIFETIME ACHIEVEMENT

Why in news?

- Writer Arundhati Roy has been awarded the 45th European Essay Prize for lifetime achievement.
- She will receive the award, along with the prize money of CHF 20,000 (approx Rs 18 lakh), at a ceremony on September 12 in the Swiss city of Lausanne.

Key Highlights:

- She has been awarded the prize for the French translation of her compilation of essays titled 'Azadi' (2021).
- In 'Azadi', she has reflected on the meaning of freedom in a world of 'growing authoritarianism'.
- The essays include meditations on language, public as well as private, and on the role of fiction and alternative imaginations in current times.

Other works by Roy:

- The Delhi-based author's works, including Booker Prize winning "The God of Small Things", "The Ministry of Utmost Happiness", and "My Seditious Heart" have garnered her national and international acclaim.

About European Essay Prize:

- Since its inception in 1975, the award by the Charles Veillon Foundation has honoured a book or the work of an author "who, through their writings, contributes to nourishing and spreading the evolution of thought".
- It draws attention to authors whose work bear witness to and offer a fertile commentary on current societies, their practices, and ideologies.

- Earlier, authors including Alexandre Zinoviev, Edgar Morin, Tzvetan Todorov, Amin Maalouf, Siri Hustvedt, Alessandro Baricco, Jean Starobinski, Iso Camartin, and Peter von Matt have been awarded the European Essay Prize.

GANDHI PEACE PRIZE FOR 2021 TO BE CONFERRED ON GITA PRESS, GORAKHPUR

Why in news?

- The Gandhi Peace Prize for the year 2021 is being conferred on Gita Press, Gorakhpur.
- It was chosen in recognition of it's outstanding contribution towards social, economic and political transformation through non-violent and other Gandhian methods.

About Gandhi Peace Prize:

- Gandhi Peace Prize is an annual award instituted by Government of India in 1995, on the occasion of 125th Birth Anniversary of Mahatma Gandhi as a tribute to the ideals espoused by Mahatma Gandhi.
- The award is open to all persons regardless of nationality, race, language, caste, creed or gender.
- The award carries an amount of Rs. 1 crore, a citation, a plaque and an exquisite traditional handicraft/ handloom item.

Past awardees:

- The past awardees include organizations such as ISRO, Ramakrishna Mission, Grameen Bank of Bangladesh, Vivekananda Kendra, Kanyakumari, Akshaya Patra, Bengaluru, Ekal Abhiyan Trust, India and Sulabh International, New Delhi.
- Recent awardees include Sultan Qaboos Bin Said Al Said, Oman (2019) and Bangabandhu Sheikh Mujibur Rahman (2020), Bangladesh.

About Gita Press:

- Established in 1923, Gita Press is one of the world's largest publishers, having published 41.7 crore books in 14 languages, including 16.21 crore Shrimad Bhagvad Gita.
- The institution has never relied on advertisement in its publications, for revenue generation. Gita Press along with its affiliated organizations, strives for the betterment of life and the well being of all.

PRACTICE QUESTION FOR UPSC PRELIMS EXAM

1. Consider the following statement:
   1. Friendship Shield 2023 was conducted between PLA and the Laotian People's Armed Forces (LPAF).
   2. PLA STC conducted the 'Golden Dragon' drills with Indonesia.

   Choose the correct option from the codes given below:
   a) 1 Only b) 2 Only
   c) 1 and 2 d) None of the above
2. Consider the following statements with respect to Combined Maritime Forces (CMF):
   1. India joined as a member to this organization.
   2. It is Bahrain based multinational, voluntary maritime coalition.
   3. Its main focus areas are defeating terrorism, preventing piracy, encouraging regional cooperation, and promoting a safe maritime environment.

   Choose the correct option from the codes given below:
   a) 1 and 2 b) 2 and 3
   c) 1 and 3 d) 1, 2 and 3
3. Consider the following statement regarding Acinetobacter Baumannii:
   1. It is a Gram-negative bacillus that is aerobic, pleomorphic and non-motile.
   2. It is an opportunistic bacterial pathogen.

   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 Abaucin:
   1. It is an effective drug against A.baumannii.
   2. It appears to work by disrupting lipoprotein trafficking.
   3. A lipoprotein is a molecular framework required to transport fat inside cells.

   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 Ahilyabai Holkar:
   1. She appointed Tukojirao Holkar as the Chief of Army.
   2. She rebuilt Kashi Vishwanath temple in Kashi.
   3. She moved the capital to Vidisha.

   Choose the correct option from the codes given below:
   a) 1 and 2 b) 2 and 3
   c) 1 and 3 d) 1, 2 and 3
6. Consider the following:
   1. Phukot Karnali Hydro Electric Project: Karnali River
   2. Pancheshwar Multipurpose Project: Mahakali River
   3. Lower Arun Hydroelectric Project: Bhagmati River

   Choose the correct option from the codes given below:
   a) Two pairs correct b) One pair correct
   c) Three pains correct d) None of the above
7. Consider the following statement regarding Mission Vatsalya Scheme:
   1. It is a roadmap to achieve women empowerment only.
   2. The Scheme is implemented as a Centrally Sponsored Scheme.
   3. The Ministry of Women and Child Development is the nodal ministry.

   Choose the correct option from the codes given below:
   a) 1 and 2 b) 2 and 3
   c) 1 and 3 d) 1, 2 and 3
8. Consider the following statement regarding GOBARdhan Scheme:
   1. It was launched as a national priority project under the Swachh Bharat Mission Grameen.
   2. The Department of Drinking Water and Sanitation, Ministry of Jal Shakti are the nodal ministry.

   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 statement regarding Agni 1 ballistic missile:
   1. It is a single-stage, solid-fuel missile.
   2. Strategic Forces Command first deployed this missile in 2007.
   3. It is capable of carrying a nuclear warhead.

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

10. Consider the following statement regarding Cauvery River:
1. It flows in a south-easterly direction.
2. It extends over the states of Tamil Nadu, Karnataka, Kerala and the Union Territory of Puducherry.
3. Bhavani is the major left bank tributaries.
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

11. Consider the following statement regarding INS Trishul:
1. It is the second frigate of the Talwar class.
2. Talwar class frigate has been built in Russia under an Indo-Russian joint production.
3. It is not equipped with stealth technology.
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

12. Consider the following statement regarding Sal Tree:
1. It is leafless during summer season.
2. It occurs in northern and central Indian regions.
3. The resin of this tree is used in the indigenous system of medicine.
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

13. Consider the following statement regarding gift tax:
1. The gift is exempted from tax if it was given by a relative.
2. Gifts received during weddings are usually exempted from tax.
3. Gifts received as part of the inheritance are exempted from tax.
Choose the correct option from the codes given below:
a) One pair is correct b) Two pair is correct
c) Three pair is correct d) None of the above

14. Consider the following statement regarding Acinetobacter baumanni:
1. It is a Gram-negative bacteria.
2. It has been associated with hospital-acquired infections in India.
3. It was acknowledged to be a "red alert" pathogen.
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

15. Consider the following statement regarding Udanti Sitanadi Tiger Reserve:
1. It is located in Chhattisgarh.
2. Deodhara and Godene falls are famous fall near the reserve.
3. The Pairi river flow through the Reserve.
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

16. Consider the following statement regarding Kavach System:
1. It is an indigenously developed Automatic Train Protection (ATP) system.
2. It helps the loco pilot in running the train during inclement weather conditions such as dense fog.
3. It cannot controls the speed of the train.
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

17. Consider the following statement regarding Fixed-Dose Combination (FDC) Drugs
1. It increase the risk of medication, which is particularly important in patients with chronic diseases.
2. It includes two or more active pharmaceutical ingredients (APIs) combined in a single dosage form.
3. Cough syrups is one of the common example.
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

18. Consider the following statement regarding Seaweeds:
1. They do not extract nutrition from the roots.
2. They often form dense growths on rocky shores or accumulations in shallow water
Choose the correct option from the codes given below:
a) 1 Only b) 2 Only
c) 1 and 2 d) None of the above

19. Consider the following:
1. Argentina 2. Bolivia
3. Chile
Which of the above following country is the part of Lithium triangle?
a) 1 and 2 b) 2 and 3
c) 1 and 3 d) 1, 2 and 3

20. Consider the following statement regarding Petroleum Coke:
1. It releases toxic gases after burning.
2. It is widely used in cement, steel and textile plants in India.
3. It has low calorific value.

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

21. Consider the following OPEC+:
    1. It is a permanent intergovernmental organization of oil-exporting countries.
    2. The core group consists of members mainly from middle eastern and African countries.
    3. Bahrain was the founding member of this organisation.

    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 Dudhwa Tiger Reserve:
    1. It includes two sanctuary Pilibhit sanctuary and Sohagi Barwa Sanctuary.
    2. The vegetation is of Moist Deciduous type.
    3. Spotbilled pelican is the variety of bird found in this reserve

    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

23. Consider the following statement regarding sonic boom:
    1. It is a thunderous noise caused by an object moving faster than the speed of sound.
    2. Sonic booms create huge amounts of sound energy.

    Choose the correct option from the codes given below:

    a) 1 Only b) 2 Only
    c) 1 and 2 d) None of the above

24. Consider the following statement regarding Duty-free quota-free (DFQF) scheme:
    1. It is duty free quota-free access for Least Developed Countries (LDC).
    2. It was first taken at the WTO Hong Kong Ministerial Meeting in 2005.
    3. India became the first developing country to extend this facility to LDCs in 2008

    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

25. Consider the following statement regarding Foot rot disease:
    1. It is also known as Bakanae Disease.
    2. It is caused by 'Fusarium verticillioides' fungi.
    3. It is common in all types of paddy crops.

    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 District Legal Services Authority:
    1. The State Government in consultation with the Chief Justice of the High Court constitutes this body.
    2. The person to be appointed shall belong to the State Judicial Service not lowers than rank than that of a Subordinate Judge.
    3. It is a constitutional body.

    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 Mahua Tree:
    1. It is mainly cultivated or harvested for edible oil.
    2. It is a frost resistant species.
    3. It requires loamy or sandy-loam soils.

    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 Norovirus:
    1. It is a common and very contagious virus.
    2. It is also sometimes referred to as the 'stomach flu' or the 'winter vomiting bug'.

    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 regarding Kanha Tiger Reserve:
    1. It has a significant population of Royal Bengal Tiger, sloth bear and Indian wild dog.
    2. The Park is respected globally for saving the Barasingha from near extinction.
    3. Barasingha is the state animal of Madhya Pradesh.

    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 Bitumen:
    1. It is highly viscous, petroleum-based hydrocarbon.
    2. It is found in deposits such as oil sands and pitch lakes.
    3. It does not deform under any circumstances.

    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 Hypersonic missiles:
    1. It moves five times faster than the speed of sound.
    2. Higher speed provides higher manoeuvrable.
    3. Only United States and Russia have successfully tested hypersonic missiles.

    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

32. Consider the following statement regarding Varunastra:
    1. It is a surface-to-surface missile.
    2. It is developed by NSTL, DRDO and BDL.
    3. It can be fired from all Anti-submarine warfare (ASW) ships.

    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

33. Consider the following statement regarding Defibrillators:
    1. It is a device that send an electric pulse or shock to the heart to restore a normal heartbeat.
    2. They are used to prevent or correct an arrhythmia.

    Choose the correct option from the codes given below:
    a) 1 Only b) 2 Only
    c) 1 and 2 d) None of the above

34. Consider the following statement regarding Fattah Missile:
    1. It is an intermediate range ballistic missile developed by Iran.
    2. It can travel at hypersonic speeds.
    3. It uses solid propellants.

    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

35. Consider the following statement regarding Gulf of Mannar Marine National Park:
    1. Gulf of Mannar is one of the biologically richest coastal regions in all of mainland of India.
    2. It is the first Marine Biosphere Reserve in the South and South East Asia.
    3. It boasts mangroves aquatic ecosystems only.

    Choose the correct option from the codes given below:
    a) 1 and 2 b) 2 and 3
    c) 1 and 3 d) 1, 2 and 3

36. Consider the following statement regarding Food Safety Index:
    1. It is an annual assessment released by the Food Safety and Standards Authority of India (FSSAI).
    2. This index is based on the performance on five significant parameters.
    3. Among the large State category, Tamil Nadu tops the list.

    Choose the correct option from codes given below:
    a) 1 and 2 b) 2 and 3
    c) 1 and 3 d) 1, 2 and 3

37. Consider the following statement regarding Kakhovka Dam:
    1. It is located on the Dniester River.
    2. It was built as part of the Kakhovka hydroelectric power plant.
    3. The reservoir also supplies water to the Zaporizhzhia nuclear plant.

    Choose the correct option from codes given below:
    a) 1 and 2 b) 2 and 3
    c) 1 and 3 d) 1, 2 and 3

38. Consider the following statement regarding Kilauea Volcano:
    1. It is the youngest and most active Hawaiian shield volcano.
    2. Kilauea has a large summit caldera with a central crater.

    Choose the correct option from the codes given below:
    a) 1 Only b) 2 Only
    c) 1 and 2 d) None of the above

39. Consider the following statement regarding Mission on Advanced and High-Impact Research (MAHIR):
    1. The mission aims to quickly identify emerging technologies in the power sector.
    2. It will be chaired by the Union Minister for Power & New and Renewable Energy.
    3. It is alternatives to Lithium-Ion storage batteries.

    Choose the correct option from codes given below:
    a) 1 and 2 b) 2 and 3
    c) 1 and 3 d) 1, 2 and 3

40. Consider the following statement regarding Dnieper River:
    1. It is the fourth longest river in Europe.
    2. It runs from the uplands of Russia's Valdai Hills.
    3. It does not flow through Belarus.

    Choose the correct option from codes given below:
    a) 1 and 2 b) 2 and 3
    c) 1 and 3 d) 1, 2 and 3

41. Consider the following statement regarding Convention on the Conservation of Migratory Species of Wild Animals (CMS):
    1. It is also referred to as Bonn Convention.
    2. It provides a global platform for the conservation and sustainable use of migratory animals and their habitats.
    3. It is not the only global and UN-based intergovernmental organisation for the conservation and management of terrestrial, aquatic and avian migratory species.

Choose the correct option from the codes given below:
a) 1 and 2 b) 2 and 3
c) 1 and 3 d) 1, 2 and 3

42. Consider the following statement regarding TAPI Pipeline:
1. The project is being funded by the World Bank.
2. It will pass through Turkmenistan Afghanistan, Pakistan and finally, India.
3. It is also called the 'Peace Pipeline'.
Choose the correct option from the codes given below:
a) 1 and 2 b) 2 and 3
c) 1 and 3 d) 1, 2 and 3

43. Consider the following statement:
1. Circulation of winds around the cyclones is in the anticlockwise direction.
2. The monsoon trough is a low-pressure region.
Choose the correct option from the codes given below:
a) 1 Only b) 2 Only
c) 1 and 2 d) None of the above

44. Consider the following statement regarding First Loss Default Guarantee (FLDG):
1. The fintech originates a loan and promises to compensate the partners up to a pre-decided percentage in case customers fail to repay.
2. It will also rationalise the existing prudential norms to implement resolution plans.
3. It includes everything from payment processing solutions to mobile banking apps.
Choose the correct option from the codes given below:
a) 1 and 2 b) 2 and 3
c) 1 and 3 d) 1, 2 and 3

45. Consider the following statement regarding Pulsars:
1. They are rotating neutron stars observed to have pulses of radiation at very regular intervals.
2. They are among the few celestial objects that emit circular polarised light.
3. They have weak magnetic field.
Choose the correct option from the codes given below:
a) 1 and 2 b) 2 and 3
c) 1 and 3 d) 1, 2 and 3

46. Consider the following statement regarding Diabetes:
1. It is a chronic disease.
2. Insulin is a hormone that regulates blood glucose.
3. It is a Communicable 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

47. Consider the following statement regarding Gulabi meenakari handicraft:
1. It is practice in the line of Madhubani.
2. It is an art form from Persia and involves colouring the surface of metals by fusing different colours.
3. The word 'mina', refers to the azure colour of heaven.
Choose the correct option from the codes given below:
a) 1 and 2 b) 2 and 3
c) 1 and 3 d) 1, 2 and 3

48. Consider the following statement regarding Jal Jeevan Mission:
1. It is based on a community approach to water.
2. The Mission will converge with other Central and State Government Schemes.
Choose the correct option from the codes given below:
a) 1 Only b) 2 Only
c) 1 and 2 d) None of the above

49. Consider the following statement regarding Respiratory syncytial virus:
1. It is a common respiratory virus.
2. It is the most common cause of bronchiolitis.
3. A virus is an infectious microbe consisting of a segment of nucleic acid.
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

50. Consider the following statement regarding Sagar Samriddhi:
1. It aims to tighten the monitoring regime for dredging contracts.
2. It is part of the government's efforts to expedite the 'Waste to Wealth' initiative.
3. Dredging is the removal of sediments and debris from the bottom of lakes, rivers, harbours, and other water bodies.
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

51. Consider the following statement regarding Dimethyl Ether:
1. It has a very high cetane number.
2. It is used in chemical industries and to produce dyes and plastics.
3. Under normal condition, it is green in colour.
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

52. Consider the following statement regarding Protosterol Biota:
    1. It belongs to the family of organisms called prokaryotes.
    2. These are discovered inside a rock at the bottom of the ocean.
    3. They have a complex structure combining mitochondria.

    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

53. Consider the following statement regarding power exchange:
    1. At present India has three power exchanges.
    2. Here buyers and sellers at each exchange do trading of electricity and discover spot price separately

    Choose the correct option from the codes given below:
    a) 1 Only b) 2 Only
    c) 1 and 2 d) None of the above

54. Consider the following statement regarding Nutrient Based Subsidy scheme:
    1. The scheme is being implemented by the Department of Fertilizers.
    2. A fixed amount of subsidy decided on each grade of subsidized Phosphatic & Potassic (P&K) fertilizers.
    3. It helps farmers in ensuring availability of essential nutrients at subsidized prices.

    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

55. Consider the following statement regarding Captagon pill:
    1. It is a highly addictive amphetamine-type drug.
    2. It is produced mainly in Syria.
    3. Amphetamine-type drug stimulates muscular system.

    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

56. Consider the following statement regarding Wilful Defaulter:
    1. They are considered as entities that do not pay back money despite the ability to do so.
    2. Banks initiate action against such accounts under laws like SARFAESI Act, Companies Act, 2013, Fugitive Economic Offenders Act etc.
    3. There is a specific law for legal action against Wilful defaulters.

    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

57. Consider the following statement regarding Kosovo-Serbia tension:
    1. Serbia had recognize Kosovo's statehood.
    2. Kosovo is a mainly ethnic Albanian populated territory.
    3. Kosovo was earlier part of Serbia.

    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

58. Consider the following statement regarding Diego Garcia Island:
    1. It is the largest and southernmost member of the Chagos Archipelago.
    2. It consists of a V-shaped sand-fringed cay and its lagoon is open at the north end.

    Choose the correct option from the codes given below:
    a) 1 Only b) 2 Only
    c) 1 and 2 d) None of the above

59. Consider the following statement:
    1. Anak Krakatau volcano is located in Indonesia's Sunda Strait between the main Java and Sumatra islands.
    2. The Sunda Strait is the strait between the Indonesian islands of Java and Sumatra.
    3. Sunda Strait connects the Java Sea to the Indian Ocean.

    Choose the correct option from the codes given below:
    a) 1 and 2 b) 2 and 3
    c) 1 and 3 d) 1, 2 and 3

60. Consider the following statement regarding Gilgit Manuscripts:
    1. It is the oldest surviving manuscript collection in India.
    2. It was written on the birch bark and were found in Kashmir region.
    3. It contains only canonical Buddhist works.

    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

61. Consider the following statement regarding New Development Bank (NDB):
    1. It is formerly referred to as the BRICS Development Bank.
    2. Its main objective is to Financing infrastructure and sustainable development projects in BRICS.
    3. Membership in NDB is not open to any member of the United Nations.

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

62. Consider the following statement regarding Global Slavery Index 2023:
1. Maximum number of people living in modern slavery is in Eritrea Mauritania.
2. The report is released by International Labour Organization (ILO).
3. The index presents a global picture of modern slavery.

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

63. Consider the following statement regarding Ex Ekuverin:
1. It is a bilateral annual exercise.
2. The exercise is held between India and Maldives.

Choose the correct option from the codes given below:

a) 1 Only b) 2 Only
c) 1 and 2 d) None of the above

64. Consider the following statement regarding Mayon Volcano:
1. It is an active volcano in southeastern Luzon, Philippines.
2. Its name is derived from the local word for beautiful lady, daragang Mayon.
3. It lies in the Pacific Ring of Fire region.

Choose the correct option from the codes given below:

a) 1 and 2 b) 2 and 3
c) 1 and 3 d) 1, 2 and 3

65. Consider the following statement regarding Chikungunya:
1. It is a viral disease transmitted to humans through the bites of mosquitoes infected with the chikungunya virus.
2. It is most commonly transmitted by mosquitoes, Aedes (Stegomyia) aegypti and Aedes (Stegomyia) albopictus.
3. It was first described during an outbreak in southern Tanzania.

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

66. Consider the following statement regarding Jellyfish Galaxy (JO206):
1. It trails across the universe about 700 million light-years away from our planet.
2. It resembles their marine namesakes and that is evident in the image.
3. It is not a constellation.

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

67. Consider the following statement regarding Global Partnership on AI (GPAI):
1. It is the fruition of an idea developed within the G20 countries.
2. It is a multi-stakeholder initiative which aims to bridge the gap between theory and practice on AI.
3. Its secretariat is at the Organisation for Economic Cooperation and Development (OECD).

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

68. Consider the following statement regarding PM Matru Vandana Yojana:
1. It is a Centrally Sponsored Direct Benefit Transfer (DBT) scheme.
2. It aims to improve health-seeking behaviour amongst Pregnant Women & Lactating Mothers (PW&LM).

Choose the correct option from the codes given below:

a) 1 Only b) 2 Only
c) 1 and 2 d) None of the above

69. Consider the following statement regarding International Organization of Supreme Audit Institutions:
1. It is an autonomous, independent and non-political organization.
2. It has special consultative status with the Economic and Social Council (ECOSOC) of the United Nations.
3. It works to promote auditing standards, good governance of SAIs, and SAI independence.

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

70. Consider the following statement regarding Sea Lettuce:
1. It is commonly referred to as seaweed.
2. It is perennial, and grows all year, although the largest blooms occur during the summer.
3. It does not requires sunlight to flourish.

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

71. Consider the following statement regarding India Infrastructure Project Development Funding Scheme (IIPDF):
    1. It is a Central Sector Scheme which will aid the development of quality PPP projects.
    2. The corpus is initiated by Ministry of MSME.

    Choose the correct option from the codes given below:
    a) 1 Only b) 2 Only
    c) 1 and 2 d) None of the above

72. Consider the following statement regarding Execution only platform (EOP):
    1. There is a specific framework available for technology/digital platforms.
    2. It is a digital or online platform which facilitates transactions such as subscription.
    3. No entity would be allowed to operate as an EOP without obtaining registration

    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

73. Consider the following statement regarding Gender Social Norms Index (GSNI) 2023:
    1. It quantifies biases against women, capturing people's attitudes toward women's roles
    2. Countries with greater bias in gender social norms also show a lower presence of women in parliament.

    Choose the correct option from the codes given below:
    a) 1 Only b) 2 Only
    c) 1 and 2 d) None of the above

74. Consider the following statement regarding golden jackal:
    1. It is also known as common jackal.
    2. They are small compared to their close relatives, wolves, and wild dogs.
    3. Scientific name is Canis aureus.

    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

75. Consider the following statement regarding Food Corporation of India (FCI):
    1. It comes under the ownership of the Ministry of Consumer Affairs, Food and Public Distribution.
    2. Its objectives is to procure and supply grains to PDS for distributing subsidized staples to economically vulnerable sections of society.
    3. It is a Constitutional body.

    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

76. Consider the following statement regarding MQ-9B Sea Guardian:
    1. It is useful for long-hour surveillance.
    2. It is also capable of automatic take-offs and landings.
    3. It support maritime surveillance only.

    Choose the correct option from the codes given below:
    a) 1 and 2 b) 2 and 3
    c) 1 and 3 d) 1, 2 and 3

77. Consider the following statement regarding Tongo:
    1. This Island is located in North Atlantic Ocean.
    2. It is an archipelago.
    3. Its western islands are volcanic.

    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

78. Consider the following statement regarding Cerebrum:
    1. It receives and gives meaning to information from the sense organs and controls the body.
    2. The cerebellum and brainstem sit below the cerebrum.

    Choose the correct option from the codes given below:
    a) 1 Only b) 2 Only
    c) 1 and 2 d) None of the above

79. Consider the following statement regarding Export-Import Bank of India (EXIM Bank):
    1. It wholly owned by the Government of India.
    2. It extends Lines of Credit (LOCs) to overseas financial institutions and regional development banks.
    3. It functions as the principal financial institution for financing export and import of goods and services with a view to promoting the country's international trade.

    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

80. Consider the following statement regarding Bangkok Vision 2030:
    1. The vision was presented by Thailand to build a Prosperous, Resilient, and Open (PRO) by 2030.
    2. The Vision sets a clear direction and priorities as well as a goal for BIMSTEC collaboration to tackle challenges and seize opportunities for the coming decade.
    3. The goals found in the vision are also in line with Thailand's bio-circular-green economic model only.

    Choose the correct option from the codes given below:

a) 1 and 2 b) 2 and 3
c) 1 and 3 d) 1, 2 and 3

81. Consider the following statement regarding National Bank for Financing Infrastructure and Development (NaBFID):
1. It is a specialized Development Finance Institution in India.
2. It aims is to addressing the gaps in long-term non-recourse finance for infrastructure development.
3. It is not regulated and supervised by RBI.
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

82. Consider the following statement regarding Solar Ultraviolet Imaging Telescope (SUIT)
1. It will provide full disk images of the sun in 4000 to 6000 A wavelength range.
2. It will also measure the UV radiation hazardous for skin cancer.
3. It will help in the measurement of solar radiation from Hard X-ray to Infrared.
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

83. Consider the following statement regarding International North-South Transport Corridor (INSTC):
1. The corridor includes seaports on the Persian Gulf and in the Caspian region.
2. The main purpose of the corridor was to reduce carriage costs and transit time between India and Russia.
Choose the correct option from the codes given below:
a) 1 Only b) 2 Only
c) 1 and 2 d) None of the above

84. Consider the following statement regarding Alligator garfish:
1. It is a close relative of the bowfin species.
2. It is a predator fish and a carnivore.
3. It is a ray-finned euryhaline fish and is one of the biggest freshwater fish in North America.
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

85. Consider the following statement regarding Non-Banking Financial Company (NBFC):
1. They provide banking services like loans, credit facilities.
2. NBFCs are regulated by the Reserve Bank of India (RBI), the central bank of India.
3. They offer various banking services also have a banking license.
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

86. Consider the following statement regarding Duck-billed dinosaur:
1. They could easily adopt a bipedal and quadrupedal posture.
2. This type was common in North America, Asia and Europe during the Cretaceous period.
3. They were carnivorous dinosaur.
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

87. Consider the following statement regarding Monkeypox:
1. It is a fungal disease.
2. It can be transmitted between humans through close contact and exposure.
3. There is no effective vaccine available for Monkeypox infection.
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

88. Consider the following statement regarding Malcha Mahal:
1. It was built by Firoz Shah Tughlaq.
2. It came to be known as Wilayat Mahal.
Choose the correct option from the codes given below:
a) 1 Only b) 2 Only
c) 1 and 2 d) None of the above

89. Consider the following:
1. Codex Alimentarius Commission
2. Agricultural Heritage Systems of Global Importance (GIAHS)
3. Desert Locusts
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

90. Consider the following statement regarding Artemis Accords:
1. These are a non-binding set of principles designed to guide civil space exploration.
2. It will help to ensure the maintenance of a safe and predictable outer space environment.
3. India is a founding member of this accord.
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

91. Consider the following statement regarding LEED Certification:
    1. It is the world's most widely used green building rating system in the world.
    2. This certification provides a framework for healthy, highly efficient, and cost-saving green buildings.
    3. This rating system is developed by UNEP.

    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

92. Consider the following statement regarding INS Vagir:
    1. It is a Kilo-class submarine.
    2. It is built under Project-75.
    3. It has advanced stealth features.

    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

93. Consider the following statement regarding Non-steroid Anti-inflammatory Drugs:
    1. These are medicines that are widely used to relieve pain, reduce inflammation, and bring down a high temperature
    2. The most popular examples of drugs in this group are aspirin and ibuprofen.

    Choose the correct option from the codes given below:
    a) 1 Only b) 2 Only
    c) 1 and 2 d) None of the above

94. Consider the following statement regarding Reef Sharks:
    1. They are indicator species for marine ecosystems.
    2. They are threatened by the degradation and destruction of their coral reef habitat.
    3. Their habitation is tropical waters near coral reefs.

    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

95. Consider the following statement regarding Gandhi Peace Prize:
    1. It was instituted on the occasion of the 125th Birth Anniversary of Mahatma Gandhi.
    2. Sultan Qaboos Bin Said Al Said of Oman was awarded this award
    3. The prize can be given to institutions and organisations only.

    Choose the correct option from the codes given below:
    a) 1 and 2 b) 2 and 3
    c) 1 and 3 d) 1, 2 and 3

96. Consider the following statement regarding INS Kirpan:
    1. It is a Khukri class missile corvette.
    2. The Khukri class are equipped with Diesel Engines assembled in India.
    3. It does not perform the role of Humanitarian Assistance and Disaster Relief (HADR) operations.

    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

97. Consider the following statement regarding recently discovered Y Chromosome:
    1. It possesses genes that are linked to growth.
    2. Chromosome is a thread-like structure located inside the nucleus of animal and plant cells.
    3. Chromosome is made of protein and a single molecule of deoxyribonucleic acid (DNA).

    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

98. Consider the following statement regarding National Internet Exchange of India (NIXI):
    1. It is non-profit organization under the Companies Act 2013.
    2. It is tasked to increase Internet penetration and adoption in India by facilitating the various infrastructure aspects.

    Choose the correct option from the codes given below:
    a) 1 Only b) 2 Only
    c) 1 and 2 d) None of the above

99. Consider the following statement regarding Al-Hakim Mosque:
    1. It is constructed of brick with stone facades and minarets.
    2. The plan of the mosque consists of a triangle with four arcades centering a courtyard.
    3. It is a historical mosque located in Cairo.

    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

100. Consider the following statement regarding Mediterranean Sea:
    1. It is bordered by Europe, Asia and Africa.
    2. It is connected to the Atlantic Ocean via the narrow Strait of Gibraltar.
    3. It is connected to the Black Sea via Suez Canal.

    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

101. Consider the following statement regarding Research and Analysis Wing (R&AW):
1. It was established to handle the India's international intelligence affairs.
2. It carries both covert and overt operations.
3. It operates under the aegis of Defence Minister.
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

102. Consider the following statement regarding Asia Pacific Plant Protection Commission:
1. It was established by United Nation Environment Programme (UNEP).
2. It was an intergovernmental organization that promotes cooperation among countries in the Asia-Pacific region to enhance plant health and plant protection.
3. India is a member of this commission.
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

103. Consider the following statement regarding Lake Victoria:
1. It is bordered by Tanzania, Uganda, and Kenya.
2. It is a source of the White Nile River.
Choose the correct option from the codes given below:
a) 1 Only b) 2 Only
c) 1 and 2 d) None of the above

104. Consider the following statement regarding Gangotri National Park:
1. The area is bordering Kedarnath Wildlife Sanctuary and Govind National Park.
2. Chaukhamba I, Satopanth and Kedarnath Main are the major peaks within this park.
3. Gangotri Glacier is located in the park boundaries.
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

105. Consider the following statement regarding GEMCOVAC –OM Vaccine:
1. It is implemented by Biotechnology Industry Research Assistance Council (BIRAC).
2. It is delivered intra-dermally using a needle-free injection device system.
3. It requires ultra-cold chain infrastructure.
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

106. Consider the following statement regarding Global Gender Gap Report 2023:
1. It is released annually by the World Economic Forum (WEF).
2. Iceland is the most gender-equal country in the world for the 14th consecutive year.
3. India rank is better than Bangladesh, Nepal and Sri Lanka.
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

107. Consider the following statement regarding Canary Island:
1. It is an archipelago located in the Pacific Ocean.
2. They have a subtropical climate.
3. It has rich volcanic soils.
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

108. Consider the following statement regarding Deendayal Antyodaya Yojana-National Urban Livelihoods Mission (DAY-NULM):
1. It is a flagship mission under the Union Ministry of Housing and Urban Affairs.
2. It has the aim to uplift the urban poor by enhancing sustainable livelihood opportunities through skill development
Choose the correct option from the codes given below:
a) 1 Only b) 2 Only
c) 1 and 2 d) None of the above

109. Consider the following statement regarding Tryptophan:
1. It is an amino acid needed for normal growth in infants for maintenance of the body's proteins, muscles, enzymes, and neurotransmitters.
2. The body helps to make melatonin and serotonin.
3. The liver can also use tryptophan to produce niacin.
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

110. Consider the following statement regarding Sarmat Missile:
1. It is a new generation intercontinental ballistic missile.
2. It is capable of carrying 10 or more nuclear warheads.
3. It is capable of firing ICBM into a upper orbit of the Earth.
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

111. Consider the following statement regarding PM Kisan Samman Nidhi (PM-KISAN):
1. The scheme aims to supplement the financial needs of the farmers to ensure proper crop health.
2. Under the scheme, an income support of 6,000/- per year in three equal instalments.
3. The scheme is funded by centre and State

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

112. Consider the following statement regarding National Consumer Disputes Redressal Commission:
1. It is a statutory body.
2. The Commission is headed by a sitting or a retired Judge of the Supreme Court of India or a sitting or retired Chief Justice of the High Court.
3. It also provides for a 3-tier structure of the National Commission

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

113. Consider the following statement regarding PM-Kisan Mobile App:
1. It is a newly launched application has the feature of face Authentication.
2. The app was developed by the National Informatics Centre in collaboration with the Ministry of Electronics and Information Technology.

Choose the correct option from the codes given below:
a) 1 Only b) 2 Only
c) 1 and 2 d) None of the above

114. Consider the following statement regarding Jeera (Cumin) cultivation:
1. It is native to the Mediterranean region.
2. It grows well in both tropical and sub-tropical climates.
3. It is a highly weather-sensitive 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

115. Consider the following statement regarding Global Liveability Index 2023:
1. Healthcare, culture, environment, education, and stability are the five metrics.
2. This ranking offers insights into the cities that excel in providing an exceptional quality of life.
3. Tokyo, Seoul and Melbourne are the top cities to live.

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

116. Consider the following statement regarding Mineral Security Partnership:
1. It is an ambitious new initiative to bolster critical mineral supply chains.
2. The goal of the alliance is to ensure that critical minerals are produced, processed and recycled
3. The major critical minerals are Radium, Caesium and Francium.

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

117. Consider the following statement regarding Kalasa-Banduri Project:
1. It is built on Godavari River.
2. The project remains a dispute between Karnataka, Goa and Maharashtra.
3. The main goal of the project is to meet the drinking water needs in the district of Karnataka.

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

118. Consider the following statement regarding Bureau of Indian Standards (BIS)
1. It is an independent, non-governmental international organisation.
2. It works under the Ministry of Consumer Affairs, Food & Public Distribution.

Choose the correct option from the codes given below:
a) 1 Only b) 2 Only
c) 1 and 2 d) None of the above

119. Consider the following statement regarding Belize:
1. It is located on the northeast coast of Central America and south of the Yucatán Peninsula.
2. It has a land of mountains, swamps, and tropical jungle.
3. It is bounded by Mexico to the north, Guatemala to the west and south, and the Caribbean Sea to the east.

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

120. Consider the following statement regarding Abohar wildlife sanctuary:
1. The entire area of Sanctuary is community-owned land.
2. It is located in the state of Assam.

Choose the correct option from the codes given below:

a) 1 Only b) 2 Only
c) 1 and 2 d) None of the above

121. Consider the following statementt regarding Debrigarh Wildlife Sanctuary:
1. It finds a special mention because of noted freedom fighter Veer Surendra Sai.
2. It has a dry deciduous forest.
3. It is located near Godavari River.

Choose the correct option from the codes given below:

a) 1 and 2 b) 2 and 3
c) 1 and 3 d) 1, 2 and 3

122. Consider the following statement regarding Auroras:
1. In southern hemisphere is called Aurora Borealis.
2. The sun is ejecting charged particles from its corona, creating solar wind.
3. The hemispheric asymmetry of the aurora is due in part to the sun's magnetic field interfering with Earth's magnetic field.

Choose the correct option from the codes given below:

a) 1 and 2 b) 2 and 3
c) 1 and 3 d) 1, 2 and 3

123. Consider the following statement regarding Chiral Bose-Liquid State:
1. It exist in solid, liquid or gas forms.
2. The top layer is electron-rich, and these electrons can move freely.

Choose the correct option from the codes given below:

a) 1 Only b) 2 Only
c) 1 and 2 d) None of the above

124. Consider the following statement regarding Air Independent Propulsion (AIP) System
1. It allows the submarines to stay for longer hours in water.
2. It decreases the noise levels made by the submarines.
3. AIP is mostly implemented as an auxiliary source.

Choose the correct option from the codes given below:

a) 1 and 2 b) 2 and 3
c) 1 and 3 d) 1, 2 and 3

125. Consider the following statement regarding INS Sunayna:
1. It is a Saryu class Offshore Patrol Vessel.
2. The ship also has an automatic power management system.
3. It is not supported by Electronic Support Systems.

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 3Ans: a

PRACTICE QUESTION FOR UPSC MAINS EXAM

1. What is causing China's growing influence in Southeast Asia? How does the Global Security Initiative challenge the ASEAN countries? Why is the increasing proximity of the U.S. with the Philippines worrisome for China?
2. What are the challenges in the way of growth of manufacturing sector in India? Discuss why the economic reforms of 1991 and the current initiatives failed to boost the manufacturing sector growth?
3. Why the European Union's Carbon Border Tax Mechanism is an important issue in the ongoing India-EU free trade agreement negotiations? Discuss how India should work with the EU to secure gains on CBAM and ensure smooth onboarding for Indian exporters to maximize the benefits of a bilateral deal?
4. Why do differences persist between India and China on the Depsang Plains and Demchok? What is the status of talks? Where do the two sides stand after the flare-up that began in May 2020? Where have buffer zones been created during the disengagement process?
5. The state of the wrestlers' protests points to the changed state of 'citizen activism' that India once saw a decade ago. Comment.
6. What are the pros and cons of deepfake technology? Discuss how the weaponisation of deepfakes can have a massive impact on the economy, personal freedom, and national security? Also discuss the role of civil society oversight to promote awareness and encourage advancement and innovation.
7. States are critical actors in India's energy transition as there is a multi-tier governance of energy production and usage. Comment. Also discuss ways to bridge the ambitions and implementation gaps between the Centre and the States.
8. As the need and interest for a functional regional organisation grow amongst the Bay of Bengal countries to address emerging economic and security concerns, the time is ripe for BIMSTEC to carve its niche in the region. Comment.
9. Keeping in view the recent collision in Balasore, Odisha, work towards devising a safer system in the Indian Railways should begin in earnest start without waiting for any inquiry report. Comment.
10. To assure passengers of safety after Balasore accident, Railways needs to instil discipline at a systemic level, move away from individual-centred approaches and ensure greater coordination between operations and maintenance. Elaborate.
11. Why did a multi-train crash happen at Balasore in Odisha despite the stretch being equipped with the 'error-proof' electronic interlocking system? What could have caused the error? What are the basic components of an electronic interlocking signal system?
12. India beholds a colossal opportunity to add to its nation's demographic dividend by investing in nutrition interventions in adolescent girls. Comment.
13. The SCO is an attractive forum for regional states, but its internal contradictions are a cause for concern. Keeping the view the upcoming 23rd Summit of SCO, discuss what are the opportunities and challenges for India in this era of fragile geopolitical contestations?
14. India's law of taxation is built on precepts which emanate out of a larger commitment to the rule of law, in particular to values of legality and certainty. Upholding these principles requires a commitment not only from the legislature but also from our courts too. Comment.
15. India's high prevalence of stunting, wasting, and anaemia continues to pose public health risks for children and women. Discuss the role of empowering Anganwadi workers to tackle gaps in existing social sector schemes.
16. The most important steps taken during the recent visit of the US Secretary of Defence in June 2023 to India was towards strengthening the bilateral defence relationship by creating a road map to promote collaboration in the defence industry. Comment.
17. Discuss how recent announcement of Russia and Iran developing efficient functioning of the North-South Trade Corridor (NSTC) will help India to produce a viable transit solution in the region.
18. Waste management and climate change are closely inter-related. Discuss why it is important to integrate climate considerations in waste management and broader urban planning frameworks?
19. A lightweight payment and settlement system, by not being reliant on the internet, can be an important building block for a resilient financial ecosystem of any economy, as it can be invaluable in times of adversity. Elaborate.
20. World Refugee Day (June 20) is a reminder of our collective responsibility as global citizens and a call for engagement and empathy. Refugees can be a source of prosperity in any nation where they take refuge. Elaborate.

21. Discuss why India's earlier attempts to set up semiconductor fabrication plant failed and examine alternate approaches. What lessons could India take from China, a major semiconductor hub?
22. The National Mental Health Programme and the decentralised District Mental Health Programme remain focused on the patient but neglect the caregiver. The situation of the caregiver is similar to that of the 'boiling frog' where the individual might not be aware of the emotional strain, and hence will not request for support. Comment.
23. Discuss the concept and future prospects of a Professor of Practice (PoP). Also discuss how it can could help bridge the gap between academia and the professional world?
24. India-UAE Comprehensive Economic Partnership Agreement (CEPA) is not only opening India's access to the UAE market but also helping to expand the footprint of Indian startups in other geographies in West Asia and North Africa. Comment.
25. With General Electric and Hindustan Aeronautics Limited signing a memorandum of understanding to co-produce F414 engines in India, how will it boost IAF strength?

PRACTICE QUESTION FOR UPSC PRELIMS EXAM

ANSWER KEY

1.	(a)	2.	(b)	3.	(c)	4.	(d)	5.	(a)	6.	(a)	7.	(b)	8.	(c)	9.	(d)	10.	(a)
11.	(a)	12.	(b)	13.	(c)	14.	(d)	15.	(a)	16.	(a)	17.	(b)	18.	(c)	19.	(d)	20.	(a)
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.	(d)
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.	(d)	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)										

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