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MAY 2023

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- UN water conference
- Saudi Arabia's quest for strategic autonomy
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- Open-source seeds movement?
- Global Business Environment Rankings (BER)
- Census on Water Bodies in India
- World Bank's Logistic Performance Index
- National Quantum Mission
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PREETAM KUMAR

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EDITOR IN CHIEF

Dr. S. S. Pandey

DIRECTOR

Shipra Pandey

EXECUTIVE EDITOR

Rakesh Pandey

CO-EXECUTIVE EDITOR

Saket Anand

MANAGEMENT CONSULTING

Shankar Bharti, Marina

EDITING SUPPORT

Vipin, Niraj, Vivek, Sudhir Prasad,
Vikas Tiwari, Manoj Singh, Abhijeet,
Md. Shoaib, Prakash Jaiswal

TYPE SETTING AND DESIGNING

Suryajeet, Pooja Saluja,
Sunil, Praveen

HEAD OFFICE

289, Dhaka Johar, Near Dusshara
Ground, Dr. Mukherjee Nagar, Delhi-09

CONTACT OFFICE

704, In Front of Batra Cinema, Dr.
Mukherjee Nagar, Delhi-09

Contact: 7428092240,
9312511015, 8851301204

Email : dikshantias2011@gmail.com

Web.: www.dikshantias.com

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POLITY & GOVERNANCE

REPRESENTATION IN INDIA'S POLICE FORCES



Why in news?

- ⇒ On a national level, it will take another 24 years to have 33% women in police forces across States. These figures are a part of the India Justice Report 2022, released by Tata Trusts recently.
- ⇒ It ranks police forces of States based on various indicators such as vacancies as against the sanctioned strength of personnel, representation of women and Scheduled Caste/Scheduled Tribe communities and so on.
- ⇒ Overall, the Telangana police have bagged the top rank among States with populations over 10 million, while West Bengal has come in last.

What is the state of police vacancies?

- ⇒ The third edition of the India Justice Report notes that the gap between the sanctioned and actual strength in police forces, at a national level, remains "worryingly large".
- ⇒ As per the report's findings, between January 2020 (second edition) and January 2022, the overall vacancies in police rose from 20.3% of the sanctioned strength to 22.1%.
- ⇒ In the case of police constables, as of January 2022, while West Bengal was the worst performer among large and mid-size States with vacancies amounting to 44.1% of the sanctioned strength, Kerala was at the top with constable vacancies making up 4.6% of the sanctioned strength.
- ⇒ As for police officers (in civil as well as District Armed Reserve police), Bihar has the highest percentage of vacancies at 53.8% as against the sanctioned strength.
- ⇒ The report also mentions that some States bring down their sanctioned strength, which can

consequently result in reduced vacancy levels. For instance, between 2020 and 2022, Kerala reduced the sanctioned strength of civil police by 239 personnel, resulting in a reduction of vacancies while workload increased.

How many States fulfil their quotas for women and SC/ST communities?

- ⇒ Despite years of reservations, Karnataka was found to be the only State to meet its SC, ST, and Other backward classes quotas, with no other State/UT managing to meet all three of their reservation targets. Among large and mid-sized States, Gujarat, at 131%, performed the best in terms of the percentage of actual SC police officers to its reservation quota, while Uttar Pradesh came in last, with just 43% SC officers against its quota.
- ⇒ As for the constabulary workforce, Karnataka had 116% of SC constables against its quota, while Haryana had the lowest at 63%. As for small States, Goa and Sikkim were the best performers for the percentage of SC officers and constables, respectively.
- ⇒ In terms of fulfilling reservations for STs, Karnataka, at 176%, was the best performer on the police officer level, going beyond its reserved ratio. For ST constables, Bihar fulfilled its quota by 278%, while Punjab came in last amid large and medium States at 0.01%.

Women's representation:

- ⇒ When it comes to women's representation in the police force, most States have their own specific quotas for how many women there should be in the police force. For instance, six UTs and nine States have a target of 33% reservation for women.
- ⇒ Elsewhere, targets range from Bihar's 35% to 10% in Arunachal Pradesh, Meghalaya and Tripura. Five States/UTs, including Kerala and Mizoram, have no reservations. As per the findings, no State which had the 33% criteria, managed to meet it.
- ⇒ However, among large and medium States, Andhra Pradesh which reserves 33% of overall police posts for women, performed the best with 21.8% being its share of women in police. Jharkhand was the worst performer with its share of women in police being just 6.2%.
- ⇒ In small States, Himachal Pradesh was at the top with 14% of police personnel being women, while Tripura came in last with just 5.3%. Among Union Territories, Ladakh had 28.3% women in police, while Jammu and Kashmir had just 3.3%.

GOVT. RELEASES PRE-DRAFT OF NATIONAL CURRICULUM FRAMEWORK FOR SCHOOLS



Why in news?

- Recently, the Ministry of Education released a “pre-draft” version of the National Curriculum Framework for School Education and has sought feedback from various stakeholders, including students, parents, teachers, teacher educators, experts, scholars and professionals.
- The pre-draft covers the framework of curriculum for age groups 3 to 18.

Six pramanas:

- A key part of the document is inclusion of values and its “rootedness” in India.
- The document further says that it leans towards making students acquainted with true sources of knowledge, which have been a philosophical preoccupation of ancient Indians. These sources focus on six pramanas:
 - a) pratyaksa, interpreted as perception through five senses;
 - b) anumana, which uses inferences to come to new conclusions;
 - c) upamana, which is knowing through analogy and comparison;
 - d) arthapatti, which involves knowing through circumstantial implication,
 - e) anupalabdhi, which includes perception of non-existence, and
 - f) sabda, which the document explains is “something an individual can only directly know a fraction of all reality through direct experience and inference but must rely on other experts was acknowledged thousands of years ago”.

Moral development:

- A part of the document focuses on the moral development of a child through panchakosha vikas or five-fold development. This concept is an ancient explanation of the importance of the body-mind link in human experience and understanding.
- The pre-draft recommends developing moral values for the child through a balanced diet, traditional games, yoga asanas, as well as a wide variety of

stories, songs, lullabies, poems, prayers to develop a love for cultural context.

Courses in Grade 10-12:

- The pre-draft says that for Grade 10 certification, students will have to take two essential courses from humanities, maths and computing, vocational education, physical education, arts education, social science, science and interdisciplinary areas.
- In Grade 11 and 12, students will be offered choice-based courses in the same disciplines for more rigorous engagement.
- Arts education will include music, dance, theatre, sculpture, painting, set design, scriptwriting, while inter-disciplinary areas will include knowledge of India, traditions and practices of Indian knowledge systems.
- For Class 11 and 12, the document states, “Modular Board Exams will be offered as opposed to a single exam at the end of the year and final result will be based on cumulative result of each exam.”
- The document focuses on the importance of questioning by giving examples of the Upanishads.

TRIALS CAN BE TRANSFERRED ONLY IN EXCEPTIONAL CASES: SC



Why in news?

- The Supreme Court has held in a judgment that criminal cases under trial should be transferred from one State to another only in “exceptional circumstances”. Unnecessary shifting of cases would affect the morale of the State judiciary and prosecution agency.

What was the case before SC?

- A Bench led by Justice Surya Kant was recently dealing with the murder of a political worker, Kurban Sha, in Purba Medinipur, West Bengal.
- Sha was shot dead by goons in 2019. The family of Sha had approached the top court to transfer the trial to Assam. They alleged that a fair trial was not possible in West Bengal.
- The State government suddenly, in 2021, ordered the public prosecutor to withdraw the prosecution against the accused. The Calcutta High Court pro-

actively stepped in and annulled the government notification. The trial court also refused to grant bail to the accused after the victim's family and witnesses complained of threats.

Highlights of the judgement:

- The Supreme Court commended the interventions of the judiciary, saying that "justice should not only be done, but should manifestly and undoubtedly be seen to be done".
- Declining the plea to transfer the case out of West Bengal, the court said the power to transfer cases under Section 406 of the Code of Criminal Procedure (Cr.PC) should be used sparingly and only when justice was apparently in grave peril.

Situations in which an ongoing trial could be transferred:

- The judgment summarised a catena of apex court verdicts giving the possible situations in which an ongoing trial could be transferred.
- These include
 - a) when the State or prosecution is acting hand in glove with the accused;
 - b) when there is material to show that the accused may influence the prosecution witnesses or cause physical harm to the complainant;
 - c) when comparative inconvenience and hardships are likely to be caused to the accused;
 - d) when there is a communally surcharged atmosphere indicating some proof of inability of holding fair and impartial trial because of the accusations made and the nature of the crime committed by the accused;
 - e) existence of some material from which it can be inferred that some persons are so hostile that they are interfering or are likely to interfere either directly or indirectly with the course of justice.
- The convenience of parties and witnesses as well as the language spoken by them could also act as a relevant factor when deciding a transfer petition, the court said.
- Besides the pro-active exercises, the Bench said transferring the current case would present logistical issues. More than 90 witnesses, most of whom are Bengalis, are yet to be examined.

NCF 2023 DRAFT: WHAT ARE THE PROPOSED CHANGES FOR THE INDIAN SCHOOL SYSTEM?

Context:

- School system in India may undergo a major restructuring with an expert committee appointed by the Union government recommending board examinations twice a year, a semester system for class 12, freedom to students to pursue a mix of science, humanities and commerce subjects among others.



- Recently, the Ministry of Education released the pre-draft of the National Curriculum Framework (NCF) for school education for public feedback on the recommendations.
- It will be finalised after further rounds of discussions involving the national steering committee led by former ISRO chairperson K Kasturirangan that developed it.

What is NCF?

- The NCF, which was last revised in 2005 under the Congress-led UPA government, is a key document based on which textbooks are prepared.
- So the current set of NCERT textbooks, barring the deletions, are all based on the NCF 2005. Before 2005, the NCF was revised thrice, including once under the NDA government led by Atal Bihari Vajpayee.
- Under the latest round of revision, which is underway since September 2021, draft frameworks on early childhood care and education and school education have already been prepared, while work on teacher and adult education is underway.
- Apart from textbooks, the NCF, after its adoption by the CBSE and other state boards, will also restructure various other aspects of the classroom, including choice of subjects, pattern of teaching, and assessment.

What are the proposed changes in design of subjects and exams at secondary stage?

- Among the most significant recommendations in the draft NCF on school education are about choice of subjects and exams in classes IX-XII.
- Over two years, in class IX and X, the students will have to study 16 courses categorised under eight curricular areas.
- The suggested curricular areas are Humanities (that includes languages), Mathematics & Computing, Vocational Education, Physical Education, Arts, Social Science, Science, and Inter-disciplinary Areas.
- Students will have to clear eight board exams, each of which will assess their hold on courses they learnt in class IX and X, to obtain the final certification which will factor in their performances in exams held over two years.

- Under the current system, there are no such links between class IX and X and students across most boards have to pass at least five subjects to clear class X.

Changes introduced in XII:

- The committee has recommended more changes at the level of Class XI and XII, including the introduction of a semester system in class XII.
- In terms of subjects, students will be given a choice to pick 16 courses from eight curricular areas. Currently, in Class 12, CBSE students appear for the board exam in at least five subjects and a maximum of six and there is little scope for them to pursue multidisciplinary education.
- In other words, a student who has picked a combination of Physics, Mathematics and Chemistry cannot simultaneously study History or Political Science. But under the proposed system, that will be possible as the NEP envisages “no hard separation” among arts, humanities, and sciences.
- Modular Board Examinations will be offered as opposed to a single examination at the end of the year. The final certification will be based on the cumulative result of each of the examinations.

How will teaching-learning change for younger students if the recommendations are implemented?

- At the foundational level, for children aged 3-8 enrolled in grades between preschool and class II, the pedagogical approach suggested is play based. It adds that textbooks are to be used from Grade 1 and most of the content should be concrete materials – toys, puzzles, and manipulatives.
- For grades III, IV, V or the preparatory stage, children are to be introduced to textbooks on languages, mathematics, while also retaining the activity and discovery-based approach.
- And in the middle stage (class VI, VII, VIII), natural as well as social sciences will be introduced.

When will these changes come into effect?

- The government recently announced that textbooks based on the revised NCF will be taught in schools starting from the 2024-25 academic session.
- But a specific timeline on the implementation of the changes on exams, assessment and subject design has not been made available yet.

AAP NATIONAL PARTY NOW; TRINAMOOL, CPI AND NCP LOSE STATUS

Why in news?

- Recently, the Election Commission recognised the Aam Aadmi Party (AAP) as a national party, while revoking that status of the All India Trinamool Congress, Nationalist Congress Party (NCP) and the Communist Party of India (CPI).



- With the removal of the NCP, the CPI and the Trinamool, there are now only six national parties in the country: the BJP, the Congress, the National People's Party (NPP), the Communist Party of India-Marxist (CPI-M), the Bahujan Samaj Party (BSP), and the latest addition, the AAP.

Details:

- The AAP has the status of a national party as it secured nearly 13% of the vote share and five seats in the Gujarat Assembly polls earlier in 2023, making it a State party in four States; Delhi, Goa, Punjab and Gujarat.
- The NCP lost its status as a State party in Goa, Manipur and Meghalaya; the CPI in West Bengal and Odisha; while the Trinamool was derecognised as a State party in Arunachal Pradesh and Manipur.

Key Highlights:

- The Election Commission also revoked the state party status granted to RLD in Uttar Pradesh, BRS in Andhra Pradesh, PDA in Manipur, PMK in Puducherry, RSP in West Bengal and MPC in Mizoram.
- The Commission said that NCP and Trinamool Congress will be recognised as state parties in Nagaland and Meghalaya respectively based on their performance in the recently concluded Assembly elections.
- It also granted “recognised state political party” status to the Lok Janshakti Party (Ram Vilas) in Nagaland, Voice of the People Party in Meghalaya, and the Tipra Motha in Tripura.

What is a National Party?

- A National Party would be one that has a presence ‘nationally’, as opposed to a regional party whose presence is restricted to only a particular state or region.
- National parties are usually India's bigger parties, such as the Congress and BJP. However, some smaller parties are also recognised as national parties. A certain stature is sometimes associated with being a national party, but this does not necessarily translate into having a lot of national political clout.
- Some parties, despite being dominant in a major state; such as the DMK in Tamil Nadu, BJD in Odisha, YSRCP in Andhra Pradesh, RJD in Bihar, or TRS in

Telangana and having a major say in national affairs, remain regional parties.

How is a National Party defined?

- ⇒ As per the EC's Political Parties and Election Symbols, 2019 handbook, a political party would be considered a national party if:
 - a) it is 'recognised' in four or more states; or
 - b) if its candidates polled at least 6% of total valid votes in any four or more states in the last Lok Sabha or Assembly elections and has at least four MPs in the last Lok Sabha polls; or
 - c) if it has won at least 2% of the total seats in the Lok Sabha from not less than three states.

To be recognised as a state party, a party needs:

- a) at least 6% vote-share in the last Assembly election and have at least 2 MLAs; or have 6% vote-share in the last Lok Sabha elections from that state and at least one MP from that state; or
 - b) at least 3% of the total number of seats or three seats, whichever is more, in the last Assembly elections; or
 - c) at least one MP for every 25 members or any fraction allotted to the state in the Lok Sabha; or
- ⇒ have at least 8% of the total valid votes in the last Assembly election or Lok Sabha election from the state.

SC RULING ON AGNIPATH SCHEME



Why in news?

- ⇒ Recently, the Supreme Court dismissed petitions challenging the Delhi High Court judgment which upheld the Agnipath scheme for recruitment to the armed forces.
- ⇒ Some of the petitioners included candidates who were shortlisted in the earlier recruitment process to Army and Air Force.

What was the plea before SC?

- ⇒ Advocate Prashant Bhushan who appeared for some of these candidates told the apex court that their names appeared in a provisional list for recruitment to Air Force but the recruitment process was cancelled when Agnipath scheme was notified.
- ⇒ He argued that the government must be directed to complete the old process citing the doctrine of promissory estoppel.

- ⇒ He argued that there was written exam, physical test, medical exam conducted under the old recruitment process after which a provisional selection list was published with the ranks.

What is the doctrine of promissory estoppel?

- ⇒ Promissory estoppel is a concept developed in contractual laws.
- ⇒ A valid contract under law requires an agreement to be made with sufficient consideration.
- ⇒ A claim of doctrine of promissory estoppel essentially prevents a "promisor" from backing out of an agreement on the grounds that there is no "consideration."
- ⇒ The doctrine is invoked in court by a plaintiff (the party moving court in a civil action) against the defendant to ensure execution of a contract or seek compensation for failure to perform the contract.
- ⇒ In a 1981 decision in Chhaganlal Keshavalal Mehta v. Patel Narandas Haribhai, the SC lists out a checklist for when the doctrine can be applied:
 - a) First, there must be a clear and unambiguous promise.
 - b) Second, the plaintiff must have acted relying reasonably on that promise.
 - c) Third, the plaintiff must have suffered a loss.

How does it relate to the Agnipath case?

- ⇒ The argument invoking the doctrine essentially means that the government's actions of putting up a shortlist etc would be a "promise" made by it.
- ⇒ The other party here, the candidates acted based on that promise, they refused other jobs in CRPF, BSF etc and now must be compensated for their loss.
- ⇒ However, the judges quickly refused this argument. CJI pointed out that "promissory estoppel is always subject to overarching public interest".
- ⇒ Justice PS Narasimha added that "this is not a contract matter where promissory estoppel in public law was applied, it is a public employment" and that "the question of applying this principle will not arise in this case".

AMIT SHAH LAUNCHES VIBRANT VILLAGES PROGRAMME IN ARUNACHAL



Why in news?

- Recently, Union Home Minister Amit Shah was in Arunachal Pradesh for the launch of the 'Vibrant Villages Programme' (VVP) in the border village of Kibithoo.
- The constant threat along the country's border amid the ongoing standoff with China has led to a concerted push to upgrade infrastructure in the border areas.
- To this end, the Union Cabinet on February 15 approved the allocation of Rs 4,800 crore for the Centre's 'Vibrant Villages Programme.'

What is the 'Vibrant Villages Programme'?

- This village development scheme was first announced in the 2022 Budget.
- The programme's targets are to provide comprehensive development of villages on the border with China and improvement in the quality of life of people living in identified border villages. The development in these villages will help prevent migration, and thus also boost security.
- The Parliamentary Standing Committee in 2018 had pointed towards backwardness, illiteracy, and lack of basic facilities and infrastructure in our border areas. The VVP aims to address all these issues.

Which states come under VVP?

- Under this centrally sponsored scheme, 2,967 villages in 46 blocks of 19 districts have been identified for comprehensive development.
- These villages about the border in the states of Arunachal Pradesh, Sikkim, Uttarakhand and Himachal Pradesh and the Union Territory of Ladakh. In the first phase, around 662 villages have been identified for priority coverage.

What are the funds allocated for the programme?

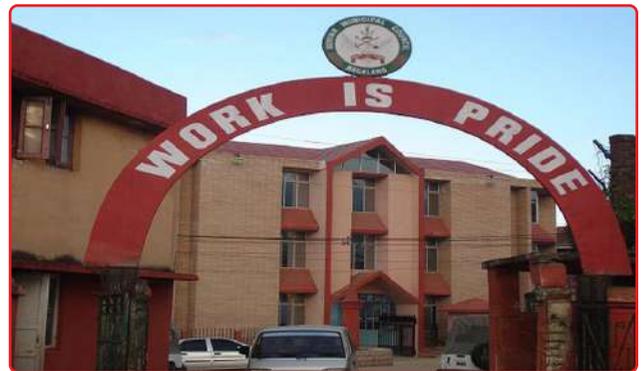
- According to Shah, a population of about 1.42 lakh people will be covered in the first phase. Under the programme, the government has allocated Rs 4,800 crore for infrastructure development and to provide livelihood opportunities in the border areas.
- Out of the total outlay, Rs 2,500 crore will be spent exclusively on the creation of road infrastructure. The total outlay is for financial years 2022-23 to 2025-26. There is a conscious effort to not overlap VVP with the Border Area Development Programme.

What are the objectives of the scheme?

- The aims of the scheme are to identify and develop the economic drivers based on local, natural, human and other resources of the border villages, as per a press release by the Ministry of Home Affairs on February 15, 2023.
- Development of growth centres on the "Hub and Spoke Model" through promotion of social entrepreneurship, empowerment of youth and women through skill development is also one of the objectives of VVP.

- Moreover, the programme also intends to leverage tourism potential through promotion of local, cultural, traditional knowledge and heritage in the border areas, thus increasing the employment opportunities of the people and, as a result, stemming migration.
- Development of sustainable eco-agribusinesses on the concept of "One village-One product" through community-based organisations, cooperatives, SHGs, NGOs etc is also aimed at.
- The district administration will prepare action plans with the help of Gram Panchayats for the identified villages to ensure 100 per cent saturation of Central and state schemes.
- The scheme envisages that drinking water, 24x7 electricity, connectivity with all weather roads, cooking gas, mobile and internet connectivity be made available in the border areas.
- Special attention will be given to solar and wind energy, tourist centres, multi-purpose centres and health infrastructure and wellness centres.

NAGALAND'S MUNICIPAL TIGHTROPE



Why in news?

- In March 2023, the Nagaland State Government preferred to be in contempt of the Supreme Court than face the wrath of the community-based organisations by repealing the Nagaland Municipal Act of 2001.

Details:

- This led to the cancellation of the State Election Commission's notification for holding elections to Nagaland's 39 urban local bodies (ULBs) with 33% of the seats reserved for women.
- The Supreme Court has however, stayed the notification cancelling the civic body polls. It was in 2023, for the first time, that Nagaland elected two women to power in the recent Assembly elections.

Why is there opposition to ULB polls?

- Nagaland is arguably the only State where ULB seats are not reserved for women as mandated by clause IV of the 74th Amendment to the Constitution of India.
- Most of the traditional tribal and urban organisations oppose the 33% reservation of seats for women as they argue that such reservation would violate the special

provisions granted by Article 371A of the Constitution to Nagaland.

- The Article states that no Act of Parliament would apply to the religious or social practices of the Nagas, Naga customary law and procedure, administration of civil and criminal justice involving decisions according to Naga customary law, and ownership and transfer of land and its resources.
- The hohos (apex tribal bodies) point out that women have traditionally not been part of decision-making bodies.

Have such polls ever been held in Nagaland?

- The first and only civic body election in Nagaland was held in 2004 without any reservation of seats for women.
- The State government amended the 2001 Municipal Act in 2006 to include 33% reservation for women in line with the 74th Amendment. This triggered widespread opposition forcing the government to indefinitely postpone the ULB polls in 2009.
- Efforts to hold the elections in March 2012 met with strong protests and in September 2012, the State Assembly passed a resolution to exempt Nagaland from Article 243T of the Constitution which is related to the reservation for women.
- This resolution was revoked in November 2016 and elections to the civic bodies with 33% reservation were notified a month later. The notification led to widespread mayhem in which two people were killed in large-scale violence and arson.
- This made the government declare the process to conduct election null and void in February 2017.

Why did the govt. decide on ULB polls this time?

- Under pressure from the Supreme Court, the current government laid the ground for holding ULB polls after consultations with various stakeholders, including churches, NGOs, and tribal bodies in March 2022. The State Election Commission on March 9 notified that the polls would take place on May 16.
- The tribal bodies and civil society organisations threatened to boycott the polls until the "borrowed" Municipal Act of 2001 factoring in women's reservation is "reviewed and rewritten in complete consonance of the voice of the Naga people" so that it does not infringe upon Article 371A.
- The government succumbed to public pressure and repealed the Municipal Act with immediate effect as the people "cannot be compelled" to participate in the elections.

What is the way forward?

- The groups against reservation for women want a "guarantee" that the 33% quota would not violate the provisions of Article 371A.
- Before "rushing to conduct" the ULB elections, they suggested that the duration of the reservation should

be capped at two tenures and demanded that the post of chairperson should not be reserved for women.

- The Naga Mothers' Association (NMA) said that the State government erred in not listening to or consulting with women's organisations before taking the decision to repeal the Municipal Act.

What the Supreme Court said about it?

- On April 17, the Supreme Court pulled up the Nagaland government for adopting an "ingenious method" of repealing the Municipal Act to evade the undertaking given to the court for holding the polls.
- It also noted "nothing has so far emerged (with respect to Article 371A) to advance a plea that religious or social practices of Nagas or Naga customary law and procedure denies the right of equality to women insofar as the participatory process is concerned in such elections".

LAUNCH OF THE INCLUSIVE DEVELOPMENT (SAMAVESHI VIKAS) CAMPAIGN



Why in news?

- The Prime Minister will launch nine campaigns under the Azadi Ka Amrit Mahotsav-Inclusive Development (Samaveshi Vikaas) theme led by the Ministry of Rural Development.

Details:

- He will launch these nine campaigns under the theme Inclusive Development as part of Azadi Ka Amrit Mahotsav on the 24th April 2023 during the National Panchayati Raj Day at Rewa, Madhya Pradesh.
- He will also launch the Website and Mobile App "Samaveshi Vikaas" on the same day.

Campaigns under the Ministry of Rural Development:

- India is observing Azadi Ka Amrit Mahotsav (AKAM) till August, 2023. One of the themes under AKAM is Inclusive Development (Samaveshi Vikaas).
- Ministry of Rural Development (MoRD) is the lead Ministry for the same, with four other supporting Ministries/Departments of the Government of India.
- Out of the nine campaigns under this theme, five are under the Ministry of Rural Development viz.,

- a) Samagra Awaas under Pradhan Mantri Awas Yojana-Gramin (PMAY-G),
- b) Financial Literacy at District Level,
- c) Promoting Digital Transaction at Gram Panchayat Level and
- d) Social Mobilisation of Eligible Rural Women into Self Help Group (SHG) Network,
- e) Plantation Drive on River Banks under Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA).

Four other Campaigns are being led by the partnering Ministries/Departments viz.,

- a) Swastha Mahila- Samriddha Samaj (SMSS)- Ministry of Health and Family Welfare,
- b) Pashudhan Jagriti Abhiyan Intensive Awareness Campaign in Aspirational Districts-Department of Animal Husbandry and Dairying,
- c) SVAMITVA, Meri Sampatti, Mera Haq- Ministry of Panchayati Raj and
- d) Natural Farming with SHG Women campaign- Ministry of Agriculture and Farmers' Welfare.

Inclusive Development theme:

- Under the Inclusive Development theme, the selection of the campaigns is focused on high-impact value and high Jan-Bhagidari potential. The campaigns are designed to have a “whole of society approach”, ensuring 100% outreach to the beneficiaries of the campaigns.
- The entire campaign is termed “Samaveshi Vikaas ”, which finds its foundation rooted in the concept of “Convergence” and “Reaching the last mile”.
- It aimed at targeted interventions through all States/ UTs, districts and gram panchayats, focusing on selected campaigns in the areas of employment generation, health, social inclusion, social security and livelihood creation by each of the participating ministries/departments.

Brief about the individual Campaigns:

Samagra Awas-Convergence under PMAY-G:

- In this campaign, a sanction of additional 45 lakh PMAY-G houses over and above 2.50 Crore already sanctioned will be ensured along with the saturation of benefits provided in convergence with Schemes providing electricity, LPG, water connections and toilets in all PMAY-G houses.

Financial Literacy at District Level:

- The main purpose of this campaign is to create awareness and increase the outreach of various banking & financial services and social security schemes. The campaign will be carried out in 500 districts and is expected to provide need-based training and awareness to 2.0 crore SHG members.
- Through village-level awareness programme, about 2.5 crore SHG members will be enrolled under Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY)

and 3.0 crore under Pradhan Mantri Suraksha Bima Yojana (PMSBY).

- During the campaign period, 750 SAKSHAM Centres will be established across states as a one-stop solution for financial awareness, service delivery and basic grievances redressal.

Promoting Digital Transaction at GP level:

- The main purpose of this campaign is to create awareness and increase the outreach of various digital modes of transactions among women SHG members and their households.
- The nationwide campaign will be carried out to create awareness to 50,000 Gram Panchayats with 3.0 Crore number of transactions and deployment of 20,000 SHG Members as Business Correspondents Sakhi / Digipay Sakhi/ Paypoints.

Social Mobilisation of Eligible Rural Women in SHG Network:

- This Campaign aims to motivate eligible rural women to join the SHG Network, to bring eligible SHGs into VO (Village Organisations) fold, to bring eligible VOs into Cluster Level Federations (CLFs) fold and to release capitalisation support to eligible SHGs.
- The campaign aims to mobilise a total of 10 crore rural households by end of the FY 2023-24 with an objective to bring all vulnerable and marginalised rural households under SHGs and draw benefits provided through this Government initiative.

Plantation Drive on Riverbanks:

- Under this campaign, plantation drive under Mahatma Gandhi NREGA will be conducted on the riverbanks.
- During the campaign period, around 4.0 crore plants will be planted in around 20,000 km of river banks.

Swastha Mahila Samriddha Samaj:

- This campaign is led by the Ministry of Health and Family Welfare (MoH&FW), which will promote health as a Credit-plus activity among Women SHGs in villages for making ‘Wellness’ a people's movement and lay emphasis on prevention and control of cancer in women – focus on screening for breast cancer and cervical cancer.

Natural Farming with SHG Women:

- This campaign will be led by Ministry of Agriculture and Farmers Welfare (MoA&FW). The campaign will ensure the restoration of soil health, including the capture of atmospheric carbon to mitigate climate change, reversal of biodiversity loss at the farm and local ecosystem levels and maintain/recycle scarce farm resources.

Pashudhan Jagriti Abhiyan- Intensive Awareness in Aspirational Districts:

- This Campaign is being led by the Department of Animal Husbandry and Dairying (DoAH&D).

⇒ In this campaign, efforts will be made to effectively transform the 112 most under-developed districts across the country by organising around 16,000 village-level camps to spread awareness on entrepreneurship and other schemes of the Department, Scientific Management of Disease and Conducting Animal Health Camps at Aspirational districts ensuring the Jan Bhagidari.

SVAMITVA-Meri Sampatti, Mera Haq:

- ⇒ This Campaign is led by Ministry of Panchayati Raj (MoPR). The campaign aims to provide 'Record of Rights' to property owners in inhabited area (abadi) of a village by the use of latest drone-based survey technology under SVAMITVA Scheme.
- ⇒ It aims to generate 1.50 crore "Records of Rights"/ Property Cards under SVAMITVA Scheme by August 2023.

INTERNATIONAL RELATIONS

THE DEMAND FOR SCOTTISH INDEPENDENCE



Why in news?

- ⇒ Recently, the British Prime Minister Rishi Sunak was quick to reject a call from the new First Minister of Scotland and leader of the governing Scottish National Party (SNP), Humza Yousaf, to hold a second referendum for Scotland's independence from the U.K.

Background:

- ⇒ The independent Kingdom of Scotland was formed in the 9th century and went on to fight wars to remain independent from the Kingdom of England. In 1603, the two kingdoms entered a personal union and were then ruled by the same monarchs.
- ⇒ In 1707, due to economic and political vulnerabilities prevailing on both sides, the British and Scottish Parliaments passed the Acts of Union, entering into a political union under the name of Great Britain.
- ⇒ While Scotland could retain some of its decision making powers it did not get equal representation in the united Parliament, and longstanding cultural and political differences remained.

- ⇒ Demands for self-governance soon began to sprout, eventually leading to two referendums in 1979 and 1997, resulting in the formation of a new devolved Parliament of Scotland in 1999.
- ⇒ This Parliament was given the mandate to form legislation on devolved issues such as health, transport, education, and so on, while the power to legislate on defence, foreign policy, trade, immigration, and currency was reserved.
- ⇒ The last referendum for independence took place in 2014, where 55% of Scots voted to stay in the three-centuries-old union while 45% voted to walk out.
- ⇒ Scotland accounts for 8% of Britain's population and economy and one-third of its landmass.

What role has the SNP played in the pro-independence movement?

- ⇒ The Scottish National Party was formed in 1934 with the merger of two parties who had been demanding the devolution of powers – the National Party of Scotland and the Scottish Party.
- ⇒ The SNP won its first seat in the British Parliament located in Westminster in a by-election but the MP refused to take up his seat.
- ⇒ The party then began circulating petitions for the creation of a devolved Parliament and came to national prominence in 1967 with Winnie Ewing taking the Hamilton seat from the Labour Party.
- ⇒ While a major political victory was still elusive, it was in the 1970s, after oil was discovered in the North Sea, that SNP ran a popular campaign in line with its central ideology of independence.
- ⇒ With the iconic slogan "It's Scotland's Oil", the party argued that if not for Britain's control over reserved matters, proceeds from the oil would have benefited the Scottish economy and consequently the Scots. The party managed to get 11 MPs elected to British Parliament in the 70s.

Why the demand for independence?

- ⇒ The SNP government says that people who live in Scotland should have the right to decide if they want to be an independent country. To relinquish doubts over the future of Scotland after independence, the SNP has been coming out with White Papers on its vision for "building a new Scotland".
- ⇒ It currently gets a bloc grant from the British government for a large part of its annual expenditure which it plans to substitute with oil revenues from the North Sea once it gets independence.
- ⇒ It says that instead of using the North Sea oil revenues to invest in future generations, the U.K. is using them to fund its current expenses, which undermines the interests of Scots.
- ⇒ It also plans to rejoin the EU, to expand its trade in the bloc, and to receive other associated benefits. The SNP also plans to keep using the British pound Sterling as its currency after independence.

- It also believes that the U.K. could make other decisions like Brexit in the future that would undermine Scottish interests.

What is the U.K.'s stand?

- The British government believes that the SNP has failed to give a clearer picture on how issues of pensions and healthcare would work in an independent Scotland. It has also warned Scotland that if it rejoins the EU, it would lead to the creation of a hard border between Scotland and Britain.
- Before the 2014 referendum, the Economic Affairs Committee of Westminster had highlighted that the retaining of the sterling as Scottish currency would be problematic as the Monetary Policy Committee of the Bank of England, which forms policy for the U.K., could not entertain the interests of a separate country.
- It also said that Scotland would find it difficult to assume its share of U.K.'s public debt, which runs into billions.
- Besides, the decommissioning of North Sea Oil would also have economic and trade implications for Britain.

What lies ahead?

- Mr. Yousaf has expressed that he is not wedded to the idea of the "de facto referendum". His priority is to first build support for independence among Scottish citizens.
- Recent polls show that the support for a 'yes' vote on independence has dropped to 39% in the country, less than it was during the 2014 referendum.

WHAT WAS DISCUSSED AT THE UN WATER CONFERENCE?



Why in news?

- The United Nations 2023 Water Conference held on March 22-24 was the first such meeting in 46 years.
- In a recent report entitled 'Water for Sustainable Development 2018 – 2028', the UN recognised the urgent need for action to meet the 2030 Sustainable Development Goal (SDG) for water, "Ensure availability and sustainable management of water and sanitation for all".

What is the water conference?

- The water sector is prone to fragmentation because water problems tend to be local. If a particular lake is polluted or a particular area is often flooded, it

needs local solutions. Therefore, there is an inherent problem in mobilising globally for local problems.

- The last UN Water Conference, held in 1977, was groundbreaking as it resulted in the first global 'Action Plan' recognising that "all peoples, whatever their stage of development and social and economic conditions, have the right to have access to drinking water in quantities and of a quality equal to their basic needs."
- This declaration led to several decades of global funding and concerted effort to lower the population without access to safe drinking water.

What are the current challenges?

- Extending services to underserved populations is relatively uncontroversial: it comes down to finding the money to pay for it. This is already occurring in India through programmes such as the Swachh Bharat Mission and the Jal Jeevan Mission.
- However, the challenge is that improving access to water and sanitation no longer translates directly to sustained access to water and sanitation.
- Groundwater over-abstraction is mostly driven by agricultural pumping. The only way to solve this problem in heavily irrigated places like Punjab is to pump less. This would need a policy change which requires many agencies and ministries to cooperate.
- As such, the water problem is no longer about access to water. The remaining SDG targets pertain to sustainable agriculture, industry, and natural ecosystems. These targets are harder as they need, among other things, tough political choices and a stronger democracy.

What are the key commitments?

- The conference resulted in 713 voluntary commitments by philanthropic donors, governments, corporations and NGOs.
- This included a \$50-billion commitment from India to improve rural drinking water services under the Jal Jeevan Mission. On the technology front, apart from specific innovations in wastewater treatment, there were several proposals for incubation platforms focusing on water management.

Solutions for knowledge-sharing:

- There are already many solutions for knowledge-sharing and thus, there is need to accelerate cross-learning. A notable tool was the W12+ Blueprint, a UNESCO platform hosting city profiles and case studies of programs, technologies, policies that addresses common water security challenges.
- An effort called 'Making Rights Real' offered to help marginalised communities and women understand how to exercise their rights.
- Similarly, the 'Water for Women Fund' offered mechanisms for more effective and sustainable water, sanitation, and hygiene outcomes for women.

Conclusion:

- However, whether these commitments will become binding through the COP process, only time will tell.

FINLAND JOINS NATO BLOC; RUSSIA SAYS MOVE WILL ESCALATE UKRAINE CONFLICT

**Why in news?**

- Finland formally joined the North Atlantic Treaty Organisation, roughly doubling the length of the border that the alliance shares with Russia and bolsters its eastern flank as the war in Ukraine grinds on with no resolution in sight.
- Finland became the 31st member of NATO.

What it translates?

- As a NATO member, Finland is bound by the alliance's mutual defence clause, Article 5.
- It will benefit not only from its allies' conventional military assistance but also from their nuclear deterrence.
- In return, the Nordic nation, which intends to boost its defence budget by 40 per cent by 2026, could contribute some of its military resources to defend the alliance.
- It has a fleet of 55 F-18 US combat aircraft, which it plans to replace with more advanced F-35s from 2025 onwards, as well as 200 tanks and more than 700 artillery guns.
- The only military equipment that NATO actually owns are a fleet of Airborne Warning and Control System planes (AWACS) and five Global Hawk high-altitude surveillance drones.
- For all other military gear, each NATO member chooses what to contribute, though all have promised to reinforce the alliance's eastern flank.

NATO troops:

- Together NATO allies represent 50 per cent of the world's military might.
- According to the Supreme Headquarters of Allied Powers in Europe (SHAPE), NATO can count on up to 3.5 million soldiers and personnel.
- The three nations providing most military staff are the United States with 1.47 million active troops plus 800,000 reservists, Turkey with 425,000 soldiers and

200,000 reservists, and France with 210,000 troops and 40,000 reservists.

- NATO has since 2004 had a multinational response force of some 40,000 soldiers on top of the 100,000 US troops already on European soil. It says it hopes to increase this to 300,000 soldiers.
- It has also set up a "spearhead force" within it, dubbed the "Very High Readiness Joint Task Force" or VJTF, able to deploy 5,000 personnel in two to three days.

Way Forward:

- The event marks the end of an era of military non-alignment for Finland that began after the country repelled an invasion attempt by the Soviet Union during the Second World War and opted to try to maintain friendly relations with Russia.
- Russia said it would strengthen its military capacity in its western and northwestern regions in response to the move.

HOUSE PANEL APPRISED OF COLLUSIVE THREAT FROM CHINA AND PAKISTAN

**Why in news?**

- Recently, the Parliamentary standing committee on defence was apprised by the Chief of Defence Staff and Secretary of the possible collusive threat from both China and Pakistan and the former's role in expansion of the Pakistan's Navy.

Details:

- The Indian Navy currently has a strength of around 130 ships and submarines and while the target is to have a 200-ship Navy, given the current trajectory, it is likely to have 155-160 ships.
- The Chinese Navy, with around 355 ships, has grown to be the world's largest Navy in terms of numbers.
- As per the standing committee report tabled in Parliament; in four-five years, the Chinese Navy will have a strength of about 555 ships. The name of China or Pakistan weren't directly mentioned and left blank in the report while describing them.

Present strength of Indian Navy:

- The Indian Navy currently has 143 aircraft and 130 helicopters. In addition, 43 ships and submarines are under construction at various shipyards, while

initial approval exists for the indigenous construction of 51 ships, six submarines and 111 Naval Utility Helicopters.

- The number of assets required for various types of aircraft is calculated based on Indian Navy's envisaged tasks and missions, available surface assets, areas of interest and other factors promulgated in the Long-Term Integrated Perspective Plan (LTIPP) 2012-27.
- However, there is a shortfall of planes and helicopters for reconnaissance and transport, which is being mitigated through progressive procurement.

Expansion of China & Pakistan:

- In a decade, China has grown from having 250 navy ships to more than 350 and has become the largest navy in the world.
- Along with their numbers, their operations have expanded and at any point of time, five to nine of their ships are operating in the Indian Ocean Region (IOR) and their research vessels are also operating, which can influence our security.
- From now to 2030, the Pakistani Navy is projected to expand by 50% with China playing the biggest role in the expansion. Hence, it is imperative that the Indian Navy expand its capability.

Way Forward:

- The committee stated that the Ministry should assess the threat perception which has increased many folds in view of hostile nations in the neighbourhood and the increase in trade in the Indian Ocean Region.

WHAT IS BEHIND CHINA'S RENAMING SPREE?



Why in news?

- Recently, the Chinese government announced it would "standardise" the names of 11 places in Arunachal Pradesh.
- The Ministry of Civil Affairs in Beijing published a list of 11 places along with a map showing the Indian State of Arunachal Pradesh as a part of China's Tibet Autonomous Region.

India's response:

- While India dismissed the renaming, which is a largely symbolic move and unlikely to have any tangible on-the-ground impact on the border dispute.

- India has underlined a hardening Chinese stance on the boundary, the dim prospects of any meaningful progress in the long-running talks, as well as the current strained relations between the neighbours.

What are the places on the list?

- The Chinese Ministry of Civil Affairs notification announced 11 "place names for public use", in Mandarin, Tibetan and English. These include five mountain peaks, two more populated areas, two land areas and two rivers. All of the 11 sites are on Indian territory, and the southernmost is close to Itanagar.
- The Chinese government referred to the location of the sites as "Zangnan", or "south Tibet", which is how it refers to Arunachal Pradesh. China claims as much as 90,000 sq km in the eastern sector of the India-China boundary, covering the entire State.

Is this the first such renaming attempt?

- This is the third time China is issuing names for places in Arunachal Pradesh, a gesture seen as provocative by India and one that has coincided with periods of strains in relations.
- In 2017, the first list of "standardised" names was issued for six places in Arunachal, which was then seen as a retaliatory move after the Tibetan spiritual leader, the Dalai Lama, visited the State.
- The second such list was issued in December 2021, more than a year into the crisis sparked by China's multiple transgressions across the Line of Actual Control (LAC) starting in April 2020. The second list had 15 places, including eight towns, four mountains, two rivers and the Sela mountain pass.
- The border law, which took effect on January 1, 2022, contains 62 articles covering delineation and border defence as well as immigration, border management and trade. The issuing of new names is related to Article 7, which calls for promoting border education at all levels of government.

What is behind China's moves?

- More broadly, the moves from Beijing point to a hardening of its stand on territorial disputes, which are now seen less as matters to be resolved diplomatically and bilaterally, but as questions of China's sovereignty.
- Besides the renaming, the new border law as well as the new regulations from the State Council all underscore how under current leader Xi Jinping, the protection of national sovereignty and territory has been mandated under various laws.
- This has also driven more activity along the borders from local-level authorities, such as stepped up programmes to build new civilian settlements (including some that have come up on territory disputed by both Bhutan and India) as well as other border infrastructure.

What will be the impact on the boundary dispute?

- Though this symbolic gesture may have little real impact on the ground, it, at the same time, also does reflect how the situation along the borders, described by India as “stable but unpredictable”, is the most concerning since the normalisation of ties between India and China in 1988, when they agreed to shelve differences and maintain peace along the boundary.
- Both sides also took tentative steps towards a permanent settlement, by appointing Special Representatives (SRs) in 2003 to find a solution to the dispute. This was, however, predicated on maintaining peace and tranquillity through a range of mechanisms set up by both sides.
- China’s 2020 transgressions have, however, left those arrangements in tatters. A large number of troops from both sides, for the first time in decades, have been stationed permanently in forward areas.
- Discussions to disengage have moved slowly, and both are yet to reach an agreement on Demchok and Depsang after having disengaged in four other friction areas.

Settlement claims:

- In the eyes of most observers, the most realistic permanent package settlement is one that would see minor adjustments along the Line of Actual Control (LAC) in both the western sector, where India sees China as occupying as much as 38,000 sq km in Aksai Chin, and in the eastern sector, where China claims as much as 90,000 sq km in Arunachal.
- Differences in the middle sector are less complex. The “swap” in the west and east tacitly suggested by then leader Deng Xiaoping in the 1980s was also along these lines.

Conclusion:

- The renaming and issuing of “standardised” names by the Chinese government has only underlined the hardening Chinese stand, which has left prospects of a settlement dimmer than ever.

SAUDI ARABIA'S QUEST FOR STRATEGIC AUTONOMY

Context:

- The Saudi Arabia’s drive to autonomise its foreign policy and build regional stability through diplomacy and its serious implications for West Asia.

How is Saudi foreign policy changing?

Saudi-Iran rapprochement:

- For years, the main driver of Saudi foreign policy was the kingdom’s hostility towards Iran. This has resulted in proxy conflicts across the region.
- For example, in Syria, Iran’s only state ally in West Asia, Saudi Arabia joined hands with its Gulf allies as well as Turkey and the West to bankroll and arm the rebellion against President Bashar al Assad.



- In Yemen, whose capital Sana’a was captured by the Iran-backed Shia Houthi rebels in 2014, the Saudis started a bombing campaign in March 2015, which hasn’t formally come to an end yet.
- One of the demands the Saudis made to Qatar when it imposed a blockade on its smaller neighbour in 2017 was to sever ties with Iran. However, the Qatar blockade came to an unsuccessful end in 2021.

New diplomacy:

- In March 2023 Saudi Arabia announced a deal, after China-mediated talks, to normalise diplomatic ties with Iran.
- Soon after, there were reports that Russia was mediating talks between Saudi Arabia and Syria, which could lead to the latter re-entering the Arab League before its next summit, scheduled for May in Saudi Arabia.
- Recently, a Saudi-Omani delegation travelled to Yemen to hold talks with the Houthi rebels for a permanent ceasefire.
- All these moves mark a decisive shift from the policy adopted by Crown Prince Muhammad bin Salman after he rose to the top echelons of the Kingdom in 2017.
- This is happening at a time when Saudi Arabia is also trying to balance between the U.S., its largest arms supplier, Russia, its OPEC-Plus partner, and China, the new superpower in the region.

Why are there changes now?

- The Saudi Arabia’s response to the Iran problem has shifted from strategic rivalry and proxy conflicts to tactical de-escalation and mutual coexistence. A host of factors seem to have influenced this shift.
- In Syria, Mr. Assad, backed by Russia and Iran, has won the civil war.
- In Yemen, while the Saudi intervention may have helped prevent the Houthis from expanding their reach beyond Sana’a and the north, the Saudi-led coalition, which itself is now in a fractured state, failed to oust them from the capital. Also, the Houthis, with their drones and short-range missiles, now pose a serious security threat to Saudi Arabia.

⇒ In parallel, the U.S.'s priority is shifting away from West Asia. So the choices Saudi Arabia is faced with, is to either double down on its failed bets seeking to contain Iran in a region which is no longer a priority for the U.S., the kingdom's most important security partner, or undo the failed policies and reach out to Iran to establish a new balance between the two.

Is Saudi Arabia moving away from the U.S.?

- ⇒ It is not. The U.S., which has thousands of troops and military assets in the Gulf, including its Fifth Fleet, would continue to play a major security role in the region.
- ⇒ For Saudi Arabia, the U.S. remains its largest defence supplier. The Kingdom is also trying to develop advanced missile and drone capabilities to counter Iran's edge in these areas with help from the U.S. and others.
- ⇒ But at the same time, the Saudis realise that the U.S.'s deprioritisation of West Asia is altering the post-War order of the region.
- ⇒ What Saudi Arabia is trying to do is to use the vacuum created by the U.S. policy changes to autonomise its foreign policy.

What are the implications for the region?

- ⇒ If Syria rejoins the Arab League, it would be an official declaration of victory by Mr. Assad in the civil war and would help improve the overall relationship between Damascus and other Arab capitals.
- ⇒ Likewise, if the Saudis end the Yemen war through a settlement with the Houthis (which would probably split Yemen), Riyadh would get a calmer border while Tehran could retain its existing influence in the Saudi backyard. Such agreements may not radically alter the security dynamics of the region but could infuse some stability across the Gulf.

Challenges:

- ⇒ While the Saudis are trying to build cross-Gulf stability, another part of West Asia remains tumultuous, which was evident in the Israeli raid at Jerusalem's Al Aqsa, Islam's third holiest place of worship.
- ⇒ This triggered rocket attacks from Lebanon and Gaza and in return Israeli bombing of both territories. Israel also keeps bombing Syria with immunity. The impact of escalation of tensions between Israel and Iran on cross-Gulf stability remains to be seen.

US Factor:

- ⇒ Another challenge before Saudi Arabia is to retain the course of autonomy without irking the U.S. beyond a point. Though the U.S. publicly welcomed the Saudi-Iran rapprochement, it complained about being "blindsided" on the Iran deal.
- ⇒ The U.S. would also not be happy with Syria, where it once sought regime change, being re-accommodated into the West Asian mainstream.

- ⇒ In post-War West Asia, the U.S. had been part of almost all major realignments; either through force or talks, from the Suez war to the Abraham Accords.
- ⇒ But now, when China and Russia are mediating talks between rivals successfully and Saudi Arabia, a trusted ally, is busy building its own autonomy, the U.S., despite its huge military presence in the region, is reduced to being a spectator.

CHINESE DUAL-USE FACILITIES IN MYANMAR AND SRI LANKA RAISE SECURITY CONCERNS IN INDIA



Why in news?

- ⇒ The construction of a military facility on Coco Islands in Myanmar and a proposed remote satellite receiving ground station system in Sri Lanka, both coming up with Chinese help, have raised concern in India of possible surveillance across the region.

Details:

- ⇒ Recent satellite images show the construction of a military facility on Coco Islands, located very close to the Andaman and Nicobar island chain.
- ⇒ In the second case, China has proposed setting up a remote satellite receiving ground station system through a collaborative effort between the Aerospace Information Research Institute, under the Chinese Academy of Sciences, and the University of Ruhuna in southern Sri Lanka.
- ⇒ Given its critical location, it can be used to spy on Indian assets and intercept sensitive information and also across the region.

Activities on the Coco Islands:

- ⇒ It is believed to be a complete military base being built entirely by the Chinese on the Coco Islands. "There are obvious concerns.
- ⇒ There was a radome (dome-shaped structure to protect radars) spotted on the island recently through satellite images, the island is being connected to the southern landmass using a new bridge that is 175 m in length and approximately 8 m wide.
- ⇒ The facility can always be used by the Chinese military when required.

➤ Earlier, the London-based think tank Chatham House published a report based on the satellite imagery of January 2023 from Maxar Technologies, which showed large-scale construction activity on the strategic archipelago.

What it translates for India?

- The satellite tracking facilities are inherently dual use in nature, the Chinese civil space programme is known to work closely with the Chinese military.
- China's expanding ground stations in the region could potentially be used to intercept sensitive information about Indian assets.
- India's satellite launch facilities in Sriharikota and the integrated missile test range in Odisha could come under the scanner of the ground station, and launches from there could be tracked to obtain sensitive data.
- Similar to the recent instance of a Chinese research and survey vessel docking at Hambantota in Sri Lanka, the stations are likely to work in coordination with such vessels to gather vital information in the region.
- For example, space tracking and surveillance ships can perform many of the same functions as ground stations, with the added benefit of mobility.

G-7 MINISTERS COMMIT TO WORK FOR CARBON-FREE ELECTRICITY BY 2035



Why in news?

- Climate and Energy Ministers and envoys from G-7 countries committed to work towards ensuring carbon-free electricity production by 2035 and "accelerating" the phase-out of coal.
- This was part of an agreement by the countries at the end of a two-day conference in Sapporo, Japan, ahead of the G-7 summit in Hiroshima in May 2023.
- A proposal to have a 2030 deadline for phasing out coal was shot down as the final text gives leeway for continued investment in gas, on the grounds that it could be a stopgap against energy shortfalls.

Solar & Wind Energy:

- The participants also agreed to accelerating solar and wind energy investments to produce 1,000 gigawatt (GW) by 2030 from solar power and 150 GW of wind power from off-shore platforms.

➤ This would be in line with recent reports by the Intergovernmental Panel on Climate Change (IPCC) that repeat the need to ensure that global temperatures not increase by more than 1.5 degrees Celsius of pre-industrial levels by the end of the century.

Assistance by developed countries:

- India had said that developing countries too needed finance, technology and assistance from developed countries for transitioning away from fossil fuels.
- Reaching targets on carbon neutrality and increased ambition "will not fly" unless they were made keeping principles of equity and climate justice at their centre.

India's participation:

- India's Union Environment Minister had also participated in the summit with India being invited as a 'guest', in the context of its presidency of the G-20.
- At the United Nations-Conference of Parties (COP) meeting in Glasgow in 2021, India had objected to language in the agreement to "phase out" and pushed instead for a "phase down" of coal.
- At the COP meeting in Sharm el Sheikh in 2022, India pushed for a proposal to phase out all fossil fuel sources, including coal and gas.
- India and China are significantly dependent on coal for electricity, whereas several developed countries, including the United States, Japan, Canada and Europe, are reliant on gas reserves. The latter however did not find mention in the final text of the Sharm el Sheikh agreement.

About G7:

- Group of Seven (G7) is an intergovernmental organisation that was formed in 1975.
- The G7 countries are the UK, Canada, France, Germany, Italy, Japan and the US.
- The bloc meets annually to discuss issues of common interest like global economic governance, international security and energy policy.
- The G7 does not have a formal charter or a secretariat. The presidency, which rotates among member countries each year, is in charge of setting the agenda. Sherpas, ministers and envoys hammer out policy initiatives before the summit.

WHAT ARE THE LATEST DEVELOPMENTS IN YEMEN?

Context:

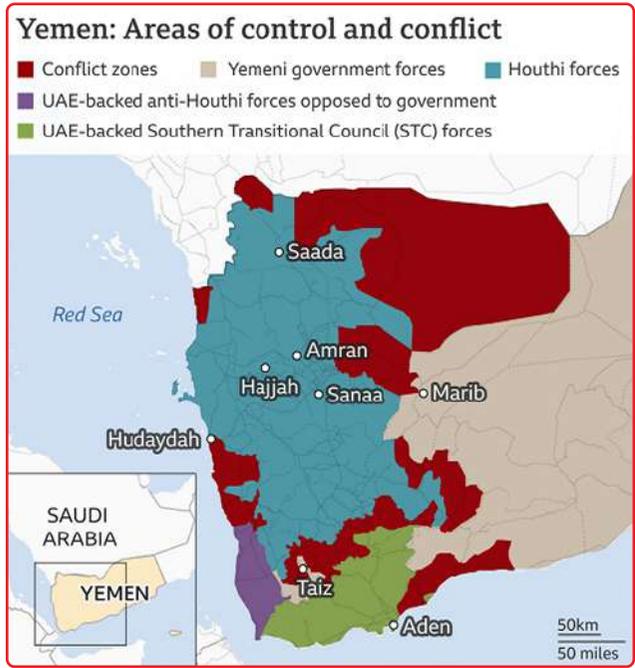
- Hundreds of prisoners captured during the war in Yemen were reunited with their families between April 14 to 16 amid diplomatic efforts to halt the conflict.
- The main warring sides in Yemen are the Iran-backed Houthis and the pro-Yemen government, Saudi-led coalition.

How did the prisoner swap happen?

- The two opposing sides had in March agreed to release 887 detainees after a ten-day meeting in

Switzerland. The parties also agreed to meet again in May to discuss more such releases, the International Committee of the Red Cross (ICRC) said.

- The large-scale prisoner swap has given the people hope for a permanent ceasefire in Yemen.



- The Houthis, backed by Iran, took advantage of Mr. Hadi's weak control and captured the Saada province in the north, and then Sana'a, the capital of Yemen, in 2014.
- The thought of Iran-backed Houthis in control of Yemen bothered neighbouring Saudi Arabia due to its differences with Iran.
- Saudi Arabia then led a coalition that included other Arab countries and sent troops to Yemen in 2015. However, they were unable to oust Houthis from Sana'a as well as from the north of the country.
- The war has continued since then and has only ceased once in April 2022, when the Houthis and the Saudi-led coalition announced a two-month ceasefire ahead of Ramzan, the holy month of Islam. This was Yemen's first nationwide truce in six years.

How has this affected Yemen?

- According to the UN, Yemen is now the largest humanitarian crisis in the world with 80% of its population dependent on aid and protection.
- Over three million people have been displaced from their homes since 2015, and public service sectors like healthcare, water, sanitation, and education have either collapsed or are in a dire situation.
- Economically too, Yemen is in the trenches. It has lost \$90 billion in economic output and more than 6,00,000 people have lost their jobs. More than half of the country's population is living in extreme poverty.

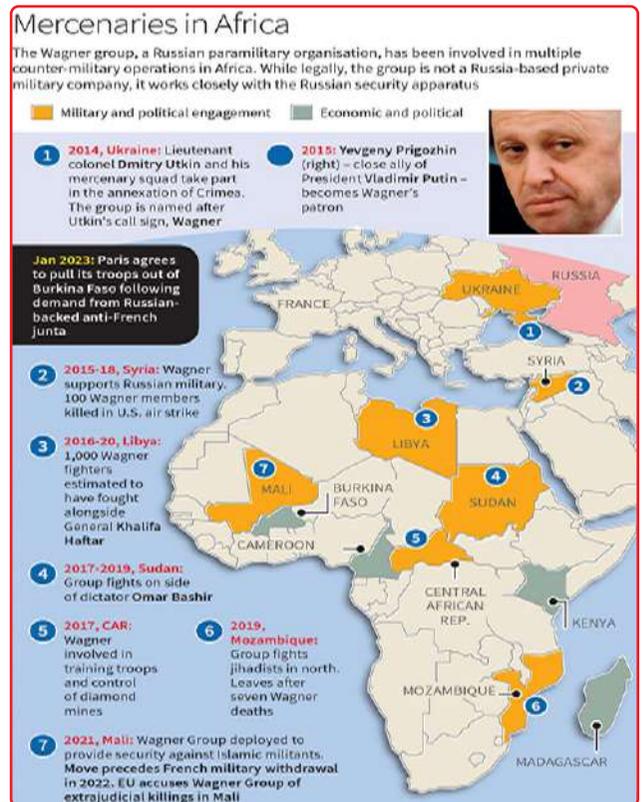
What is the Stockholm Agreement?

- The warring parties in control of parts of Yemen had signed the Stockholm Agreement in December 2018 whereby they had committed to freeing conflict-related detainees.
- The agreement brokered by the United Nations had three main components – the Hudayah agreement, the prisoner exchange agreement, and the Taiz agreement.
- The Hudayah agreement included a ceasefire in the city of Hodeidah and other clauses like no military reinforcements in the city and strengthened UN presence.
- In November 2018, hundreds of people were killed in clashes in Hodeidah, an important port in Yemen, when government loyalists supported by a Saudi-led coalition launched an attack to oust the Iran-backed Houthi rebels from the Red Sea city.
- The Taiz agreement includes the formation of a joint committee with participation from civil society and the UN.

How did the war in Yemen begin?

- The conflict in Yemen began in 2011 as part of the Arab Spring protests. President Ali Abdullah Saleh was forced to hand over power to his deputy, Abdrabbuh Mansour Hadi.
- Mr. Hadi found himself faced with an insurmountable task of tackling Yemen's economic and security problems.

THE WAGNER GROUP'S ACTIONS IN AFRICA



Context:

- After fighting erupted in Sudan's capital Khartoum on April 15, questions have been raised over the involvement of the Wagner group, which has been active in African countries for years.

What is the Wagner group?

- The Wagner group is a Russian paramilitary organisation headed by Yevgeny Prigozhin.
- Though it has been reportedly engaged in counter-militancy operations in Africa, its involvement is believed to have a more extensive scope covering political, economic and military fields.
- There have also been reports of the group supplying arms and weapons, and training regional forces in fighting jihadist threats.
- Despite its involvement in the Russia-Ukraine war, the Wagner group's presence in Africa has continued. By siding with the domestic actors in a civil war situation, the group's actions have impacted the democratic process in Africa.

How active is the Wagner group in Africa?

- The Wagner group has been active in Sudan, Mali, the Central African Republic, Mozambique and Libya in Africa.
- The activities are related to providing direct support to authoritarian governments, supporting rival leadership engaged in internal wars, filling the void created by the withdrawal of the French military engagement, taking part in resource exploitation etc.
- The Wagner group presents itself as a security provider to a few governments, mostly authoritarian ones in Africa. It has also been supporting rival leaders engaged in a civil war.

Engagement in Sudan:

- In Sudan, it began deployments during former President Omar al-Bashir's rule in 2017. The group's ties with Sudan aimed at guarding mineral resources, notably gold mines, and therefore, supported Bashir's government against international opposition.
- It also played a direct role in suppressing the Sudanese uprising in 2019 that toppled Bashir's regime.
- In Sudan, Russia has recently forged a strong relationship with the Rapid Support Forces (RSF) and its commander, General Mohamed Hamadan Dagalo. The latter is a rival leader fighting against the Sudanese army.
- However, there are, as of now, only speculations on Wagner's involvement in the ongoing violence in Sudan. Besides, Russia is set to sign an agreement with Sudan to build a military base in Port Sudan on the Red Sea.

What is the group's endgame in Africa?

- The primary goal of the group is to gain access to natural resources. Numerous reports have referred to Russia's objectives in securing access to Africa's rich

natural resources. The Wagner group's presence and moves make up one of the strategies to achieve this objective for the country.

- Secondly, Russia sees the Wagner group as an instrument of diplomacy in Africa. The Russian strategy in Africa comes with minimal cost economically but with heavy political returns.
- Russian secured 15 abstentions from African countries in the UN's resolution condemning its aggression in Ukraine. Moreover, Eritrea and Mali sided with Russia voting against the resolution.
- And finally, Russia's access to African mineral deposits is believed to be providing crucial financial support to continue the war in Ukraine. For Russia, strong ties with African countries mean a pipeline of influence for Russia's war in Ukraine.

What are the implications for Africa?

- For African countries, increasing dependency on Wagner mercenaries implies more violence, intimidation and uncertainties.
- A UN report in June 2021 said that private military groups, "particularly the Wagner Group," have violently harassed people and committed sexual violence.
- Secondly, the group posits a threat to democratic governance in Africa. The collapse of relations between the West and Sahel countries, especially Mali and Burkina Faso, paved the way for Russia to position itself as an alternative.
- Increasing trends among African governments seeking Russian mercenary assistance for mounting security concerns indicate increasing authoritarian footprints across the continent.

INDIA, CHINA HOLD 'FRANK AND IN-DEPTH' TALKS

**Why in news?**

- Recently, India and China held "frank and in-depth" talks on the two remaining friction areas on the Line of Actual Control (LAC).
- The 18th round of talks between senior military commanders since the start of the April 2020 LAC crisis, triggered by China's multiple transgressions

and mobilisation of troops, was held on the Chinese side of the Chushul-Moldo border meeting point.

No breakthrough yet:

- The statements suggested no breakthrough as yet on the two remaining friction points in Demchok and Depsang. Both sides have disengaged in four other areas along the LAC, setting up buffer zones in some of them.
- The 18th round of talks followed the first in-person meeting of the Working Mechanism for Consultation and Coordination on India-China Border Affairs (WMCC) since July 2019, which was held in Beijing in February.
- At the WMCC, both sides "reviewed the situation along the LAC" and said they "discussed proposals for disengagement in the remaining areas in an open and constructive manner, which would help in restoration of peace and tranquillity along the LAC in Western Sector and create conditions for restoration of normalcy in bilateral relations".

Status of relations:

- India has maintained that disengagement, and subsequently de-escalation along the LAC which has seen tens of thousands of troops deployed in forward areas, are both critical to restoring ties.
- Relations have since 2020 been in a state of freeze, barring the record bilateral trade figures reported in 2021 and 2022 with India's imports of Chinese goods reaching record highs, as well as the resumption of high-level visits on account of India's hosting of the Shanghai Cooperation Organisation (SCO) and G-20 summits 2023.

Bilateral trade:

- While trade has boomed, India has, as the same time, all but curtailed the inflow of once surging Chinese investment.
- India has not yet given the green light for resuming direct flights between the two countries, first suspended because of the pandemic, and yet to restart after close to three years, while cross-border movement of business people and tourists has reduced to a trickle.

China's stand:

- The China-India border issue is now gradually shifting from a conflict and a stand-off to a normalised management phase, and the situation on the border is expected to become steadier and calmer in the future.
- But the border issue remains complex, so it still requires both sides to further implement mechanisms at all levels and through different channels to meet each other halfway as much as possible, so as to find a fair and reasonable solution.

What's next?

- China's new Defence Minister, General Li Shangfu, will make his first visit to India, which is also the first

high-level military visit since the LAC crisis began, for the SCO Defence Ministers' meet.

ECONOMY

FOREIGN TRADE POLICY 2023 ANNOUNCED



Why in news?

- Recently, the Union Minister of Commerce and Industry, launched the Foreign Trade Policy 2023.
- India's overall exports, including services and merchandise exports, has already crossed US\$ 750 Billion and is expected to cross US\$ 760 Billion in 2023.

Key Approach:

- The Key Approach to the policy is based on these 4 pillars:
 - a) Incentive to Remission,
 - b) Export promotion through collaboration - Exporters, States, Districts, Indian Missions,
 - c) Ease of doing business, reduction in transaction cost and e-initiatives and
 - d) Emerging Areas - E-Commerce Developing Districts as Export Hubs and streamlining SCOMET policy.

What is Foreign Trade Policy?

- Foreign Trade Policy (2023) is a policy document which is based on continuity of time-tested schemes facilitating exports as well as a document which is nimble and responsive to the requirements of trade. It is based on principles of 'trust' and 'partnership' with exporters.
- In the FTP 2015-20, changes were done subsequent to the initial release even without announcement of a new FTP responding dynamically to the emerging situations. Hereafter, the revisions of the FTP shall be done as and when required.
- Incorporating feedback from Trade and Industry would also be continuous to streamline processes and update FTP, from time to time.

FTP 2023:

- The FTP 2023 aims at process re-engineering and automation to facilitate ease of doing business for exporters. It also focuses on emerging areas like

dual use high end technology items under SCOMET, facilitating e-commerce export, collaborating with States and Districts for export promotion.

- The new FTP is introducing a one-time Amnesty Scheme for exporters to close the old pending authorizations and start afresh.
- The FTP 2023 encourages recognition of new towns through "Towns of Export Excellence Scheme" and exporters through "Status Holder Scheme". The FTP 2023 is facilitating exports by streamlining the popular Advance Authorization and EPCG schemes, and enabling merchanting trade from India.

Process Re-Engineering and Automation

- Greater faith is being reposed on exporters through automated IT systems with risk management system for various approvals in the new FTP.
- The policy emphasizes export promotion and development, moving away from an incentive regime to a regime which is facilitating, based on technology interface and principles of collaboration.
- Considering the effectiveness of some of the ongoing schemes like Advance Authorisation, EPCG etc. under FTP 2015-20, they will be continued along with substantial process re-engineering and technology enablement for facilitating the exporters.
- FTP 2023 codifies implementation mechanisms in a paperless, online environment, building on earlier 'ease of doing business' initiatives. Reduction in fee structures and IT-based schemes will make it easier for MSMEs and others to access export benefits.
- Duty exemption schemes for export production will now be implemented through Regional Offices in a rule-based IT system environment, eliminating the need for manual interface.
- During the FY23-24, all processes under the Advance and EPCG Schemes, including issue, re-validation, and EO extension, will be covered in a phased manner.
- Cases identified under risk management framework will be scrutinized manually, while majority of the applicants are expected to be covered under the 'automatic' route initially.

Towns of Export Excellence

- Four new towns, namely Faridabad, Mirzapur, Moradabad, and Varanasi, have been designated as Towns of Export Excellence (TEE) in addition to the existing 39 towns.
- The TEEs will have priority access to export promotion funds under the MAI scheme and will be able to avail Common Service Provider (CSP) benefits for export fulfillment under the EPCG Scheme. This addition is expected to boost the exports of handlooms, handicrafts, and carpets.

Recognition of Exporters

- Exporter firms recognized with 'status' based on export performance will now be partners in capacity-

building initiatives on a best-endeavor basis.

- Similar to the 'each one teach one' initiative, 2-star and above status holders would be encouraged to provide trade-related training based on a model curriculum to interested individuals. This will help India build a skilled manpower pool capable of servicing a \$5 Trillion economy before 2030.
- Status recognition norms have been re-calibrated to enable more exporting firms to achieve 4 and 5-star ratings, leading to better branding opportunities in export markets.

Promoting export from the districts

- The FTP aims at building partnerships with State governments and taking forward the Districts as Export Hubs (DEH) initiative to promote exports at the district level and accelerate the development of grassroots trade ecosystem.
- Efforts to identify export worthy products & services and resolve concerns at the district level will be made through an institutional mechanism – State Export Promotion Committee and District Export Promotion Committee at the State and District level, respectively.
- District specific export action plans to be prepared for each district outlining the district specific strategy to promote export of identified products and services.

Streamlining SCOMET Policy

- India is placing more emphasis on the "export control" regime as its integration with export control regime countries strengthens.
- There is a wider outreach and understanding of SCOMET (Special Chemicals, Organisms, Materials, Equipment and Technologies) among stakeholders, and the policy regime is being made more robust to implement international treaties and agreements entered into by India.
- A robust export control system in India would provide access of dual-use High end goods and technologies to Indian exporters while facilitating exports of controlled items/technologies under SCOMET from India.

Facilitating E-Commerce Exports

- E-commerce exports are a promising category that requires distinct policy interventions from traditional offline trade. Various estimates suggest e-commerce export potential in the range of \$200 to \$300 billion by 2030.
- FTP 2023 outlines the intent and roadmap for establishing e-commerce hubs and related elements such as payment reconciliation, book-keeping, returns policy, and export entitlements.
- As a starting point, the consignment wise cap on E-Commerce exports through courier has been raised from ₹5Lakh to ₹10 Lakh in the FTP 2023. Depending on the feedback of exporters, this cap will be further revised or eventually removed.

- ⇒ Integration of Courier and Postal exports with ICEGATE will enable exporters to claim benefits under FTP. The comprehensive e-commerce policy addressing the export/import ecosystem would be elaborated soon, based on the recommendations of the working committee on e-commerce exports and inter-ministerial deliberations.
- ⇒ Extensive outreach and training activities will be taken up to build capacity of artisans, weavers, garment manufacturers, gems and jewellery designers to onboard them on E-Commerce platforms and facilitate higher exports.

Facilitation under Export Promotion of Capital Goods (EPCG) Scheme

- ⇒ The EPCG Scheme, which allows import of capital goods at zero Customs duty for export production, is being further rationalized. Some key changes being added are:
 - Prime Minister Mega Integrated Textile Region and Apparel Parks (PM MITRA) scheme has been added as an additional scheme eligible to claim benefits under CSP (Common Service Provider) Scheme of Export Promotion capital Goods Scheme (EPCG).
 - Dairy sector to be exempted from maintaining Average Export Obligation – to support dairy sector to upgrade the technology.
 - Battery Electric Vehicles (BEV) of all types, Vertical Farming equipment, Wastewater Treatment and Recycling, Rainwater harvesting system and Rainwater Filters, and Green Hydrogen are added to Green Technology products – will now be eligible for reduced Export Obligation requirement under EPCG Scheme.

Facilitation under Advance authorization Scheme

- ⇒ Advance authorisation Scheme accessed by DTA units provides duty-free import of raw materials for manufacturing export items and is placed at a similar footing to EOU and SEZ Scheme. However, the DTA unit has the flexibility to work both for domestic as well as export production.

Based on interactions with industry and Export Promotion councils, certain facilitation provisions have been added in the present FTP such as

- ⇒ Special Advance Authorisation Scheme extended to export of Apparel and Clothing sector under para 4.07 of HBP on self-declaration basis to facilitate prompt execution of export orders – Norms would be fixed within fixed timeframe.
- ⇒ Benefits of Self-Ratification Scheme for fixation of Input-Output Norms extended to 2 star and above status holders in addition to Authorised Economic Operators at present.

Merchanting trade

- ⇒ To develop India into a merchanting trade hub, the FTP 2023 has introduced provisions for merchanting trade.

- ⇒ Merchanting trade of restricted and prohibited items under export policy would now be possible. Merchanting trade involves shipment of goods from one foreign country to another foreign country without touching Indian ports, involving an Indian intermediary.
- ⇒ This will be subject to compliance with RBI guidelines, and won't be applicable for goods/items classified in the CITES and SCOMET list.
- ⇒ In course of time, this will allow Indian entrepreneurs to convert certain places like GIFT city etc. into major merchanting hubs as seen in places like Dubai, Singapore and Hong Kong.

Amnesty Scheme

- ⇒ Finally, the government is strongly committed to reducing litigation and fostering trust-based relationships to help alleviate the issues faced by exporters.
- ⇒ In line with "Vivaad se Vishwaas" initiative, which sought to settle tax disputes amicably, the government is introducing a special one-time Amnesty Scheme under the FTP 2023 to address default on Export Obligations.
- ⇒ This scheme is intended to provide relief to exporters who have been unable to meet their obligations under EPCG and Advance Authorizations, and who are burdened by high duty and interest costs associated with pending cases.
- ⇒ All pending cases of the default in meeting Export Obligation (EO) of authorizations mentioned can be regularized on payment of all customs duties that were exempted in proportion to unfulfilled Export Obligation.
- ⇒ The interest payable is capped at 100% of these exempted duties under this scheme. However, no interest is payable on the portion of Additional Customs Duty and Special Additional Customs Duty and this is likely to provide relief to exporters as interest burden will come down substantially.
- ⇒ It is hoped that this amnesty will give these exporters a fresh start and an opportunity to come into compliance.

U.K. TO JOIN TRANS-PACIFIC PARTNERSHIP TRADE TREATY

Why in news?

- ⇒ Recently, the U.K. acceded to the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), with Prime Minister Rishi Sunak describing the outcome as an example of "post-Brexit freedoms".
- ⇒ The agreement will now need to be ratified by Westminster and each of the CPTPP countries.

What it holds for U.K.?

Economic gains:

- ⇒ The deal would mean that more than 99% of British exports including for key markets such as cheese,

cars, chocolate, machinery, gin and whisky would have zero tariffs.



- It includes benefits such as a cut in whisky and car tariffs for British goods going to Malaysia.
- The deal would add £1.8 billion (\$2.2 billion) annually to the U.K. economy in the long run. This, however, translates to a modest boost of 0.08% to GDP.
- Once Britain becomes a member of the bloc, U.K. firms will not need to establish a local office or be resident to provide services and will be able to operate on a par with firms in host countries.

Strategic importance:

- The deal was a “gateway” to the Indo-Pacific region which would account for a majority (54%) of global economic growth in the future. The U.K. is currently also negotiating a “free trade” deal with India.
- It will also, as a CPTPP member, get a veto on whether China joins the treaty. China had applied to become a member of the bloc in September 2021. The U.S., in the Donald Trump presidency, had withdrawn from the CPTPP's precursor, the TPP.

About CPTPP:

- The CPTPP is a Free Trade Agreement (FTA) between 11 countries around the Pacific Rim which are: Canada, Mexico, Peru, Chile, New Zealand, Australia, Brunei, Singapore, Malaysia, Vietnam and Japan.
- After the US withdrew from negotiations of Trans-Pacific Partnership (TPP), the remaining 11 participants scrambled to amend the text of the agreement, and the newly renamed CPTPP was signed in March 2018. It came into force in December 2018.

PARLIAMENT CLEARS AMENDMENTS TO COMPETITION LAW WITHOUT ANY DISCUSSION

Why in news?

- Recently, the Parliament cleared the amendments to the Competition Law that will pave the way for promoting the ease of doing business as well as enhance the framework to deter entities from indulging in unfair business practices.



Background:

- The bill has been approved by Parliament nearly eight months after its introduction in Lok Sabha, which gave its nod on March 29.
- The bill was also referred to the Parliamentary Standing Committee on Finance, which tabled its report in Parliament on December 13, 2022.

Key Highlights:

- Assessment time frame:
- To ensure time-bound clearance of combinations, CCI will have to complete its assessment within 150 days instead of existing 210 days from the date of filing of combination notice by the parties.
- Also, prima facie opinion has to be formed within 30 days from the receipt of the notice, otherwise the particular deal will be deemed as approved.

Mergers:

- In CCI parlance, combinations refer to mergers and acquisitions.
- Besides, a size of transaction test will be introduced in terms of 'value of transaction' as a criteria for notifying combinations.
- All deal values involving acquisitions, mergers and amalgamations exceeding Rs 2,000 crore having target enterprise in India should be notified to CCI for approval before their consummation.

Settlement and commitments framework:

- A green channel route will be introduced for certain combinations which shall be eligible for deemed approval in a trust-based framework.
- A leniency plus framework will be put in place to incentivise the parties in an ongoing cartel investigation to disclose information regarding other existing cartels.
- In addition, there will be a settlement and commitments framework in cases of abuse of dominance and anti-competitive agreements (except for horizontal agreements). In case of settlement, compensation can be claimed by the third parties, if aggrieved, as per the ministry.
- While the scope of the law will be widened to include agreements other than vertical and horizontal agreements which are anti-competitive in nature,

there will also be a three-year limitation period for filing information before CCI to ensure that only genuine cases that adversely affect competition are considered by the regulator.

Imposition of penalties:

- Once the bill comes into force, CCI will have powers to impose penalties on entities based on their global turnover instead of the current practice of considering only relevant market turnover.

Appointment of DG:

- One of the amendments is that the power to appoint Director General (DG) will be vested with CCI instead of the central government to bring in more operational and administrative efficiency in the functioning of the regulator.
- However, such appointment will be after the prior approval of the central government as a check and balance and to ensure independence of the working of the office of DG.

Other amendments:

- Keeping in view the concerns of the Parliamentary panel, the definition of agent in the bill is being modified through official amendments. Thus, only persons employed as legal advisors by persons under investigation may be called for examination in course of investigation by the DG.
- CCI may also issue guidance notes on matters, including manner of calculation of penalty that may be imposed for contravention of the provisions of the Act, for greater transparency and certainty in its enforcement practices.

CCI Act:

- It will be the first time since the enforcement of the Competition Act in 2009 that amendment will be made to the Act.
- The Act was brought in 2002 and subsequently, it underwent amendments in 2007 and 2009. In May 2009, the anti-trust provisions of the law came into force and two years later in May 2011, CCI started screening mergers and acquisitions.

ATAL INNOVATION MISSION LAUNCHES THREE INNOVATIVE RESOURCES



Why in news?

- Atal Innovation Mission (AIM), NITI Aayog, has launched three new resources aimed at fostering innovation and creativity among India's youth.
- The launch event introduced the ATL Tinkering Curriculum, Equipment Manual and the Calendar of Activities for 2023-24.

ATL Tinkering Curriculum:

- The ATL Tinkering Curriculum is a structured learning pathway designed to help students develop and hone their innovation skills.
- The curriculum has been developed in collaboration with Makerghat and covers a wide range of concepts, from basic electronics and mechanics to cutting-edge technologies such as 3D printing and Internet of Things.
- With this curriculum, students will be encouraged to identify and design creative solutions to everyday problems through hands-on, experiential learning.

Equipment Manual:

- The Equipment Manual provides comprehensive guidance on the equipment provided in the Atal Tinkering Labs in schools across the country.
- The manual contains detailed information about each equipment and tool, including the specifications, applications, and examples of projects that can be built using them.
- It is a valuable resource for anyone looking to explore the possibilities of innovation and problem-solving.

Calendar of Activities for 2023:

- While as, the Calendar of Activities for 2023-24 outlines a year-long schedule of events, workshops, and competitions aimed at promoting innovation and entrepreneurship among students.
- The calendar has the latest Tinkering Curriculum and Equipment Manual integrated into it.
- It also has a special section called - Activity of the Month which has exciting activities that the students can do in their ATL lab every month.

Way Forward:

- The Atal Innovation Mission is committed to creating a culture of innovation and entrepreneurship among India's youth, and these resources are a testament to that commitment.
- With these resources, teachers, mentors and students across the country will be equipped with the necessary skills to innovate for a better India.

THE NPCI'S NEW CIRCULAR ON LEVY CHARGES

Why in news?

- Recently, the National Payments Corporation of India (NPCI), which governs UPI, in a circular issued directly to banks, intimated that they can now levy charges on merchant transactions made through Prepaid Instrument wallets using UPI.



⇒ NPCI said that the new interchange charges are only applicable for Prepaid Payment Instruments' (PPI) merchant transactions. The interchange fee, generally associated with card payments to cover the transaction cost, has now brought PPI wallets also under its fold.

What are PPIs?

- ⇒ Prepaid Payment Instruments (PPIs) are payment methods that can be used to purchase goods and services and send/receive money by using the stored value in the wallet.
- ⇒ Users have to pre-load the wallet with a desired amount. The amount can be loaded/reloaded against cash or through debit to bank account, or by using credit/debit cards, UPI, or any other approved payment method in India. PPIs can only be used in Indian rupees.
- ⇒ PPIs can be in the form of mobile wallets, physical smart cards, secure tokens, vouchers, or any other method that allows access to prepaid funds.

What is PPI interoperability?

- ⇒ Previously, to use PPI at any merchant, it was necessary that the concerned merchant was engaged directly by the specific PPI issuer (specific network). All PPIs with which the merchant did not have a direct tie-up would get rejected.
- ⇒ The most prevalent form of PPI used in the country is the mobile wallet, and this restriction meant that customers of one specific mobile wallet could spend the money in the wallet only at specific merchant locations which were directly tied up with the same PPI wallet provider.
- ⇒ For example, if you had a Paytm or Mobikwik wallet, you could only use it at merchants that accepted Paytm or Mobikwik QR codes. To overcome this limitation of PPIs, the RBI has mandated interoperability among different PPI issuers.
- ⇒ Subsequently, PPI issuers tied-up with NPCI for issuing (a) interoperable RuPay PPI cards or (b) creating interoperable wallets on UPI rails.
- ⇒ Prepaid instruments in the form of wallets can now be linked to UPI, thus creating interoperable wallets on UPI rails.

How does PPI interoperability through UPI work?

- ⇒ After linking one's PPI wallet to UPI, customers can transact using Scan and Pay on all UPI interoperable QR codes.
- ⇒ This will enable the use of PPI wallets at all merchant locations. The user can also send/receive money to any other wallet user.
- ⇒ Similarly, a merchant with any UPI QR code can now accept payments from any PPI issuer or mobile wallet.

Do merchants have to pay for accepting wallet transaction on UPI?

- ⇒ The PPI enabled merchants were already paying charges to the PPI issuer for acceptance of mobile wallets or prepaid cards. Now the charges are aligned at a network level with some standardisation. However, each merchant can work with their preferred acquiring entity.
- ⇒ Now, for using prepaid payment instruments (PPIs) such as gift cards, wallets etc for transactions on UPI, an interchange fee of up to 1.1% has been levied from April 1, 2023. The charges are applicable if the transaction is more than ₹2,000.
- ⇒ Officially there are no charges to be paid by the customer. However, merchants may pass on the additional burden to customers by way of price increase or some other means.

WHAT IS THE OPEN-SOURCE SEEDS MOVEMENT?



Context:

- ⇒ Farmers have innovated and shared seeds without any intellectual property rights (IPR) for centuries. They also haven't sought exclusive rights over seeds and germplasm to prevent others from innovating on the seeds.
- ⇒ However, with the emergence of the global IPR regime over plant varieties, there was a dire need to 'open-source' seeds.

What are plant-breeders' rights and patents?

- ⇒ The advent of hybrid seeds, scientific plant-breeding, and some other factors conferred developers of new varieties with the so-called plant breeders' rights (PBR) and patents, particularly in the U.S.

- In this regime, rights-holders could demand royalty on seeds and legally enforce IPR. In some national IPR regimes, rights-holders can also restrict the unauthorised use of seeds to develop new varieties.
- In 1994, the establishment of the World Trade Organization cast a global IPR regime over plant varieties. The Trade-Related IPR Agreement (TRIPS) required countries to provide at least one form of intellectual property (IP) protection. This consolidation of rights in the seeds sector raised concerns about the freedom to innovate.
- Unlike the Green Revolution, which was spearheaded by public-sector institutions, the genetic revolution in agriculture was led by the private sector, with seeds mostly availed as hybrids or protected by strong IPRs.

How is IP protected in agriculture?

- There are two major modes of IPR protection in agriculture – plant-breeders' rights and patents. Together, they restrict farmers' rights and the freedom to develop new varieties using germplasm from IP-protected varieties, and have thus increased the number of IP-protected plant varieties.
- The high prices of genetically modified seeds and IP claims triggered many problems and issues, including the State's intervention in Bt cotton seeds in India.
- As public sector breeding declined and the private sector began to dominate the seed sector, the need for alternatives became keenly felt. This is when the success of open-source software inspired a solution. In 1999, plant-breeder named T.E. Michaels suggested an approach to seeds innovation based on the principles of open-source software.

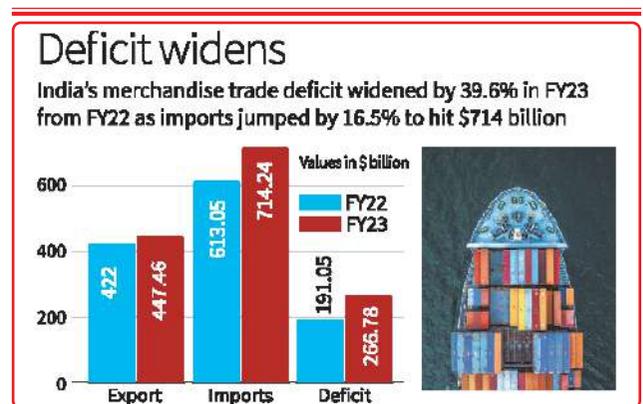
What are 'open-source seeds'?

- The German NGO Agrecol followed with a similar initiative in Europe. In Agrecol's model, the user agrees inter alia to not patent seeds bought under the open-source licence. In the U.S., the open source seeds initiative opted for a pledge based model for sharing seeds.
- In India, the Centre for Sustainable Agriculture (CSA), Hyderabad, developed a model that included an agreement between CSA and the recipient of the seed/germplasm. It is trying to use this approach through three farmer producer organisations engaged in seed production.
- Under India's Plant Variety Protection and Farmers' Rights Act 2001, farmers can register 'farmer varieties' if they meet certain conditions, and have the right to reuse, replant, and exchange seeds. However, they can't breed and trade in varieties protected under the Act for commercial purposes.
- One potential application of the open-source approach is to use it in farmer-led seed conservation and distribution systems.

Way Forward:

- There are many traditional-variety conservation and sharing initiatives in India involving farmers. Many of them focus on traditional varieties that are unique to specific regions or sites and/or have specific features.
- The model can also be used to promote farmer-led participatory plant-breeding exercises.
- Traditional varieties often lack uniformity and aren't of excellent quality for seed development and breeding purposes. Open-source principles can help overcome these two challenges by facilitating testing, improvisation, and adoption. All of these will ultimately be beneficial to India's food security and climate resilience.

GOODS EXPORTS GREW 6 PERCENT, IMPORTS 16.5 PERCENT IN 2022-23



Why in news?

- India's goods exports declined for the second successive month in March, falling a sharp 13.9% to \$38.38 billion, while imports dipped 7.9% to \$58.11 billion.
- Total goods exports in 2022-23 rose 6.03% to \$447.46 billion, while the import bill surged by a steeper 16.5% to \$714 billion in 2022-23.

Details:

- The goods trade deficit rose almost 40% to over \$266 billion in 2022-23, compared to \$190 billion in 2021-22.
- However, using estimates for services exports during March for which final data will only be available in May, the Commerce and Industry Ministry pegged the total trade deficit for the year at \$122 billion, 46% higher than the \$83.5 billion gap in 2021-22.

Top export items:

- India's uptick in outbound shipments was largely led by petroleum, up 27% to \$94.5 billion, followed by electronics goods that rose 7.9% to \$23.6 billion.
- The other three of India's top five export items registered insignificant growth: rice (up 1.5%), chemicals (1%), and drugs and pharmaceuticals (0.8%). Petroleum exports now account for 21.1% of total exports, up from 16% in 2021-22.

- ⇒ Engineering goods, India's mainstay in goods exports in recent years, shrank 5.1% to \$107 billion, bringing down their share in total exports from 26.6% to 23.9%.
- ⇒ Non-oil exports, in fact, contracted 0.5%, and if electronics exports were excluded too, goods shipments were 2.8% lower than 2021-22, which economists called a red flag.

Russian imports surge:

- ⇒ Fuelled by discounted oil shipments, India's imports from Russia grew almost 370% to over \$46 billion in 2022-23.
- ⇒ Russia's share in imports leaped from 1.6% in 2021-22 to 6.5% last year, making it the fourth largest import source nation for India, behind China, the UAE and the U.S.

China's share in imports:

- ⇒ China's share of goods imports dipped to 13.8% in the year gone by from 15.4% in 2021-22. However, imports from the country still grew 4.2% to reach \$98.5 billion last year, while exports to China fell 28% to just \$15.3 billion.
- ⇒ Indian shipments to China now account for just 3.4% of total exports, from over 5% in 2021-22.

Indian imports:

- ⇒ While petroleum imports jumped about 30% to nearly \$210 billion in 2022-23, coal imports grew at a faster 57% to almost touch \$50 billion.
- ⇒ Gold imports, on the other hand, fell around 24% to \$35 billion as global prices for the metal surged and the rupee turned weaker.
- ⇒ The U.S. remained India's top export destination, followed by the UAE, while the Netherlands emerged as the third largest goods buyer, displacing China to the fourth position in 2022-23.

Way Forward:

- ⇒ With the government setting a \$2 trillion target for goods and services exports by 2030 under the new Foreign Trade policy, the apex exporters' body FIEO sought marketing support to sell their wares around the world and an exemption from the Goods and Services Tax levied on freight for goods shipments.

WHAT IS 'DABBA TRADING' AND HOW DOES IT AFFECT THE ECONOMY?

Why in news?

- ⇒ Recently, the National Stock Exchange (NSE) issued a string of notices naming entities involved in 'dabba trading'.
- ⇒ The bourse cautioned retail investors to not subscribe (or invest) using any of these products offering indicative/assured/guaranteed returns in the stock market as they are prohibited by law.
- ⇒ It added that the entities are not recognised as authorised members by the exchange.



What is 'dabba trading'?

- ⇒ Dabba (box) trading refers to informal trading that takes place outside the purview of the stock exchanges. Traders bet on stock price movements without incurring a real transaction to take physical ownership of a particular stock as is done in an exchange.
- ⇒ For example, an investor places a bet on a stock at a price point, say ₹1,000. If the price point rose to ₹1,500, he/she would make a gain of ₹500. However, if the price point falls to ₹900, the investor would have to pay the difference to the dabba broker. Thus, it could be concluded that the broker's profit equates the investor's loss and vice-versa. The equations are particularly consequential during bull runs or bear market.
- ⇒ The primary purpose of such trades is to stay outside the purview of the regulatory mechanism, and thus, transactions are facilitated using cash and the mechanism is operated using unrecognised software terminals.
- ⇒ Other than this, it could also be facilitated using informal or kaccha (rough) records, sauda (transaction) books, challans, DD receipts, cash receipts alongside bills/contract notes as proof of trading.

Where does it become particularly problematic?

- ⇒ Since there are no proper records of income or gain, it helps dabba traders escape taxation. They would not have to pay the Commodity Transaction Tax (CTT) or the Securities Transaction Tax (STT) on their transactions.
- ⇒ The use of cash also means that they are outside the purview of the formal banking system. All of it combined results in a loss to the government exchequer.
- ⇒ In 'dabba trading', the primary risk entails the possibility that the broker defaults in paying the investor or the entity becomes insolvent or bankrupt. Being outside the regulatory purview implies that investors are without formal provisions for investor protection, dispute resolution mechanisms and grievance redressal mechanisms that are available within an exchange.

- Since all activities are facilitated using cash, and without any auditable records, it could potentially encourage the growth of 'black money' alongside perpetuating a parallel economy. This could potentially translate to risks entailing money laundering and criminal activities.

What does the scenario look like?

- Other than taxation, what lures potential investors is their aggressive marketing, ease of trading (using apps with quality interface) and lack of identity verifications.
- Depending on the individual's trading profile, observable volumes and trends, brokers keep their fees and margins open to negotiation as well.
- The mechanism could potentially translate into ripple effects for the regulated bourse as well by inducing volatility when dabba brokers look to hedge their exposures (take position in an alternate asset or investment to reduce the risk/loss with the current position). It also contributes to the bourse losing out on volumes, "even though they may not be significant".
- 'Dabba trading' is recognised as an offence under Section 23(1) of the Securities Contracts (Regulation) Act (SCRA), 1956 and upon conviction, can invite imprisonment for a term extending up to 10 years or a fine up to ₹25 crore, or both.

INDIA IMPROVES ITS RANKING BY 6 SPOTS IN GLOBAL BUSINESS ENVIRONMENT RANKINGS (BER)



Why in news?

- India improved its ranking by six spots in the latest Business Environment Rankings (BER) globally, according to data released by the Economist Intelligence Unit (EIU).
- The upward shift is due to its improved score in parameters like technological readiness, political environment, and foreign investment among others.

Details:

- The BER measures the attractiveness of the business environment in 82 countries on a quarterly basis across 91 indicators.

Key Observations:

- Though India has historically struggled to attract manufacturing investment, policy reforms are making it easier to do business in India.
- The report states that although south-east Asian economies have been the principal beneficiaries of the supply-chain diversification, in the long term, it is India that offers a potential scale comparable to that of China due to its huge domestic market.
- Of the 17 economies in the Asian region, India is ranked 10th in the 2023- 27 forecast period, up from 14th in 2018-22 period.

India's regional BER in labour markets:

- The report forecasts India's working-age population to expand by almost 100 million in the period to 2030, pushing it comfortably past 1 billion, while that of China will fall by 40 million to under 950 million.
- However, despite the ample supply, huge labour regulation and skilling remains a constraint.
- As a result, India's regional BER in labour markets improved to 13th in 2023-27 from 16th in 2018-22.

India's regional BER ranking for infrastructure:

- India's regional BER ranking for infrastructure improved to 10th in 2023-27 from 14th in 2018-22 through a host of government initiatives to boost infrastructure in the country.

India in technological readiness:

- India scores in the top 10 in technological readiness because of a more conducive environment for e-commerce and enhancement of information technology-ready government services.

Performance of other nations:

- The rankings for the second quarter of 2023 show that Singapore, Canada, and Denmark will be the three countries with the best business environment over the next five years.
- Due to deterioration in business environment in China as a result of greater policy uncertainty, tensions with the United States and reorientation of supply chains by firms, its ranking fell by 11 spots globally in the second-quarter compared with a year earlier.
- Asian countries like Vietnam emerged as the biggest gainer as it improved its position by 12 spots globally, followed by Thailand and Belgium.

INDIA'S PUBLIC STOCKHOLDING DISPUTE

Why in news?

- Recently, India defended its minimum support price (MSP) policy for foodgrains at the World Trade Organization (WTO), saying that it not only benefited vulnerable farmers but also furthered global food security, by keeping global prices in check and making foodgrains affordable for least developed countries.



India's stand at WTO?

- Under the WTO's Agreement on Agriculture (AoA), all domestic support in favour of agricultural producers is subject to rules.
- India told the WTO Agriculture Committee that its public stockholding programme ensured that it didn't have to import the vast quantities it needed for its food security needs and thereby cause the price of grains to spike—which, in turn, ensured that LDCs didn't find it too difficult to procure these. It underlined the fact that such stockholding had nothing to do with subsidised exports.
- India is facing severe criticism at the WTO from nine members, including the US and rice-exporting Thailand, over its stockholding at administered price programme and for using the 'Bali peace clause' to protect its rice subsidies.

The Agreement on Agriculture:

- The AoA categorises domestic support as Green Box support (no or minimal trade distortive effect, such as R&D support) and Amber Box support (any support that distorts trade) with MSP, in principle, being considered such support.
- The aggregate monetary value of Amber Box is subject to member-specific reduction commitments. Green Box measures are exempt from reduction commitments.
- Developing countries' public stockholding for food security is treated as Green Box support. Such support must have minimal trade-distorting effect and no specific production-favouring effect.
- Direct payments to producers that don't distort production balance (type & volume), certain developmental measures in developing countries and certain direct payments under production-limiting programmes, and de minimis levels of support are exempted from reduction.

Bali Peace Clause:

- The AoA's de minimis norms protect price support in any year, even if it is perceived as trade-distorting, if aggregate value of the product-specific support does not exceed 5% of the total value of production of the product.

- Non-product specific support less than 5% of the value of total agricultural production is also exempt from reduction. The 5% threshold applies to developed countries whereas for developing countries the de minimis ceiling is 10%.
- At the 2013 Bali conference, developing and developed nations arrived at a temporary window to protect countries' food security programmes even if these breached the de minimis rule.
- The peace clause was to be in force for four years till 2017, by when a permanent solution was to be found. The peace clause comes with exhaustive disclosures requirements including full disclosure of MSPs and annual procurement operations.

Why India's public stockholding was challenged?

- Nine major grain exporters challenged India's public stockholding in March 2023. India has invoked the Bali Peace Clause many times with respect to its grains procurement and stockholding programme.
- The countries allege that the heavily subsidised stockholding is affecting food security of other countries. India has argued the reverse, against the backdrop of the shortage of grains because of Russia's war against Ukraine.
- It reportedly told the WTO committee that while global exports of rice amounted to 56 million tonne in 2021, those covered by the national food security programme got 58 mt. It has stated that it doesn't export rice from its MSP-led procurement programme—rather, its exports are of premium quality rice.
- India has also relied on the data from its Open Market Sales Scheme that show that the biggest buyers have been state governments, and not private parties who could be suspected of exporting the grains.
- India's accusers, on the other hand, say it has not provided enough disclosures and has no mechanism to check stocks from being exported. India says it will provide certain data once it has compiled it.

What's next?

- Along with the G-33 grouping and African nations, India is seeking a permanent solution for public stockholding of foodgrains.

GOVT LAUNCHES FIFTH ROUND OF REGIONAL AIR CONNECTIVITY SCHEME 'UDAN 5.0'

Why in news?

- Under the fifth round of Ude Desh Ka Aam Nagrik (UDAN) or Regional Connectivity Scheme (RCS), the focus will be on Category-2 (20-80 seats) and Category-3 (more than 80 seats).

Key Highlights:

- Under UDAN 5.0, viability gap funding (VGF) will be capped at 600 kilometres stage length for both priority and non-priority areas, which was earlier capped at 500 km.



- ⇒ The earlier stage length cap of 600 kilometres is waived and there is no restriction on the distance between the origin and destination of the flight.
- ⇒ Besides, no pre-determined routes would be offered. Only network and individual route proposals by airlines will be considered.
- ⇒ This new and stronger version of the scheme will raise the momentum, connecting new routes and bring us closer to the target of operationalising 1,000 routes and 50 additional airports, heliports and water aerodromes in the near future.

New norms:

- ⇒ Under UDAN 5.0, airlines would be required to submit an action/business plan after two months from the issuance of LoA (Letter of Acceptance), wherein they submit details about their aircraft acquisition plan/availability of aircraft, crew and slots at the time of the technical proposal.
- ⇒ The same route will not be awarded to a single airline more than once, whether in different networks or in the same network.
- ⇒ Further, exclusivity will be withdrawn if the average quarterly PLF (Passenger Load Factor) is higher than 75 per cent for four continuous quarters to prevent exploitation of the monopoly on a route.
- ⇒ Airlines would be required to commence operations within four months of the award of the route. Earlier, this deadline was six months.
- ⇒ The 25 per cent of the performance guarantee amount will be encashed for each month of delay up to four months to further incentivise quick operationalisation of routes.

About UDAN:

- ⇒ Ude Desh Ka Aam Naagrik (UDAN) was launched as a Regional Connectivity Scheme (RCS) under the Ministry of Civil Aviation in 2016.
- ⇒ It was formulated based on the review of The National Civil Aviation Policy (NCAP)-2016 and it was planned to remain in force for a period of 10 years.
- ⇒ Under this Scheme, Regional Connectivity Fund (RCF) was created, which funds the Viability Gap Funding (VGF) requirements of the scheme through a levy on certain domestic flights.

- ⇒ VGF means a grant one-time or deferred, provided to support infrastructure projects that are economically justified but fall short of financial viability.

INDIA'S POPULATION TO EDGE AHEAD OF CHINA'S BY MID-2023, SAYS UN

Why in news?

- ⇒ Recently, the United Nations released the State of World Population Report, 2023 of the UN Population Fund (UNFPA).
- ⇒ The world's population hit the 800-crore mark in November 2022.

Key Highlights:

- ⇒ India is set to overtake China to become the world's most populous country by the middle of 2023.



- ⇒ India's population is pegged to reach 142.86 crore against China's 142.57 crore. This shows India will have 29 lakh more people than its Asian neighbour.
- ⇒ The United States is a distant third, with an estimated population of 34 crore.
- ⇒ Just eight countries will account for half the projected growth in global population by 2050: the Democratic Republic of Congo, Egypt, Ethiopia, India, Nigeria, Pakistan, the Philippines and the United Republic of Tanzania; while two-thirds of people now live in a country where lifetime fertility corresponds with zero growth.

Family Planning:

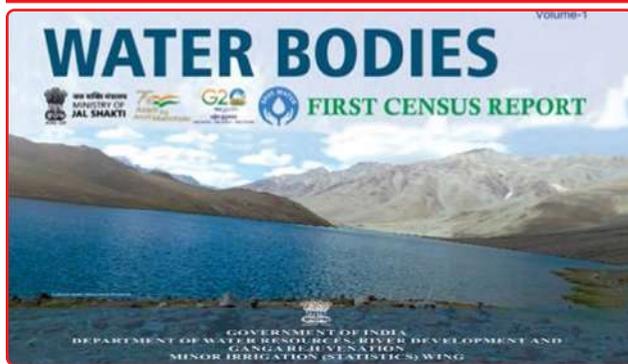
- ⇒ At a time when there have been increasing calls for imposing a two-child norm in India by various political leaders, and some States such as Assam have issued an order in 2021 to bar those with more than two children from government jobs.
- ⇒ It called for a radical rethink on how countries address changing demographics and cautioned against use of family planning as a tool for achieving fertility targets.
- ⇒ Global experience showed that family planning targets can lead to gender-based discrimination and harmful practices such as prenatal sex determination leading to sex-selective abortion.
- ⇒ Imposition of such targets can lead to imbalanced sex ratios, preferential health and nutrition for male

children, denial of the paternity of girl children, violence against women for giving birth to girl children, and coercion of women to have fewer or greater numbers of children.

Way Forward:

- With close to 50% of its population below the age of 25, India has a time-bound opportunity to benefit from the demographic dividend.
- India must convert this into "economic benefits through additional investments in health, education, and quality jobs for young people including targeted investments in women and girls."

FIRST EVER CENSUS ON WATER BODIES IN INDIA



Why in news?

- Recently, the Ministry of Jal Shakti has conducted the first-ever census of water bodies across the nation.
- The census provides a comprehensive inventory of India's water resources, including natural and man-made water bodies like ponds, tanks, lakes, and more, and to collect data on the encroachment of water bodies.

Coverage:

- The census was launched under the centrally sponsored scheme, "Irrigation Census" in convergence with the 6th Minor Irrigation Census in order to have a comprehensive national database of all water bodies.
- The information on all important aspects of the water bodies including their type, condition, status of encroachments, use, storage capacity, status of filling up of storage, etc was collected.
- It covered all the water bodies located in rural as well as urban areas that are in-use or not in-use.
- The census also took into account all type of uses of water bodies like irrigation, industry, pisciculture, domestic/ drinking, recreation, religious, ground water recharge etc. Census has been successfully completed and the All India and State-wise reports have been published.

The key features/findings of the Census are as follows:

- 24,24,540 water bodies have been enumerated in the country, out of which 97.1% (23,55,055) are in rural

areas and only 2.9% (69,485) are in urban areas.

- Top 5 States in terms of number of water bodies are West Bengal, Uttar Pradesh, Andhra Pradesh, Odisha and Assam which constitute around 63% of the total water bodies in the country.
- Top 5 States in terms of number of water bodies in urban areas are West Bengal, Tamil Nadu, Kerala, Uttar Pradesh and Tripura, whereas in rural areas, top 05 States are West Bengal, Uttar Pradesh, Andhra Pradesh, Odisha and Assam.
- 59.5% of water bodies are ponds, followed by tanks (15.7%), reservoirs (12.1%), Water conservation schemes/percolation tanks/check dams (9.3%), lakes (0.9%) and others (2.5%).
- 55.2% of water bodies are owned by private entities whereas 44.8% of water bodies are in the domain of public ownership.
- Out of all public owned water bodies, maximum water bodies are owned by Panchayats, followed by State Irrigation/State WRD.
- Out of all private owned water bodies, maximum water bodies are in hands of Individual owner/farmer followed by group of individuals and other private bodies.
- Top 05 States which lead in the private owned water bodies are West Bengal, Assam, Andhra Pradesh, Odisha and Jharkhand.
- Out of all 'in use' water bodies, major water bodies are reported to be used in pisciculture followed by Irrigation.
- Top 05 States wherein major use of water bodies is in pisciculture are West Bengal, Assam, Odisha, Uttar Pradesh and Andhra Pradesh;
- Top 05 States wherein major use of water bodies is in irrigation are Jharkhand, Andhra Pradesh, Telangana, West Bengal and Gujarat.
- 78% water bodies are man-made water bodies whereas 22% are natural water bodies. 1.6% (38,496) water bodies out of all the enumerated water bodies are reported to be encroached out of which 95.4% are in rural areas and remaining 4.6% in urban areas.
- The information on water spread area was reported in respect of 23,37,638 water bodies. Out of these water bodies, 72.4% have water spread area less than 0.5 hectare, 13.4% have water spread area between 0.5-1 hectare, 11.1% have water spread area between 1-5 hectares and remaining 3.1% of water bodies have water spread area more than 5 hectares.

Conservations efforts:

- Ministry of Jal Shakti is the nodal ministry responsible for laying down policy guidelines and programmes for the development, conservation and management of water as a national resource.
- The Ministry has multidimensional approach towards water sector, on one hand it is spearheading the ambitious programmes on providing safe and

adequate drinking water to every household in the country, eliminating open defecation in rural areas, rejuvenation of river Ganga and its tributaries, improving the safety and operational performance of existing dams, etc and on the other hand, it is involved in assessment, development and regulation of the country's water resources through technical guidance, scrutiny, clearance and monitoring.

INDIA JUMPS 6 PLACES ON WORLD BANK'S LOGISTIC PERFORMANCE INDEX, RANKS 38

Logistics Jump
India jumped six places on the World Bank Logistics Index

Soft and hard infra helps improve performance Technology also a factor Better dwell times than some advanced countries

	Rank	Rank	2018	2023
Singapore	1	LPI Rank	44	▲38
Finland	2	Customs	40	▼47
Germany	3	Infrastructure	52	▲47
Canada	7	International shipments	44	▲22
France	13	Logistics quality and competence	42	▲38
United States	17	Tracking and tracing	38	▼41
China	19	Timeliness	52	▲35
United Kingdom	19	2023 rank is grouped rank out of 139 countries, 2018 rank considered 160 countries		
Malaysia	26			
Thailand	34			
India	38			
Saudi Arabia	39			

Why in news?

- India has climbed six places on the World Bank's Logistic Performance Index (LPI) 2023, now ranking 38th in the 139 countries index, as a result of significant investments in both soft and hard infrastructure as well as technology.
- India's performance has drastically improved from 2014, when it was ranked 54th on the LPI.

Policy framework for logistics:

- The government had announced PM Gati Shakti initiative, a National Master Plan for multimodal connectivity, in October 2021 to reduce logistics cost and boost the economy by 2024-25.
- In 2022, the Prime Minister had launched the National Logistics Policy (NLP) to ensure quick last-mile delivery, end transport-related challenges, save time and money of the manufacturing sector and ensure desired speed in the logistics sector.
- These policy interventions are fructifying, which can be seen in India's jump in LPI and its other parameters.

India's journey:

- India's rank moved up five places in infrastructure score from 52nd in 2018 to 47th in 2023. It climbed to 22nd spot for international shipments in 2023 from 44th in 2018 and moved four places up to 48th in logistics competence and equality.
- In timelines, India witnessed a 17-place jump in rankings, whereas it moved up three places in rank in tracking and tracing to 38th.
- The report quotes modernisation and digitalisation as a reason for emerging economies, like India, to leapfrog advanced countries.

Role of technology:

- Technology has been a critical component of this effort, with implementation under a public-private partnership of a supply chain visibility platform, which contributed to remarkable reductions of delays.
- NICDC Logistics Data Services Limited applies radio frequency identification tags to containers and offers consignees end-to-end tracking of their supply chain.

Dwell time:

- Dwell time is how long a vessel spends at a specific port or terminal. It may also refer to the amount of time that a container or cargo spends at a port or terminal before being loaded onto a vessel or after being unloaded from a vessel. Shipping container vessels operate on schedules and delays in any particular port are felt across the service.
- The shorter the dwell time, the lower the vessel and marine-terminal operating costs.
- The average dwell time for containers between May and October 2022 was three days for India and Singapore, much better than some of the industrialised countries.
- The dwell time for the US was seven days and for Germany it was 10 days. India's very low dwell time (2.6 days) is one example.
- With the introduction of cargo tracking, dwell time in the eastern port of Visakhapatnam fell from 32.4 days in 2015 to 5.3 days in 2019.

Logistic Performance Index:

- Logistics Performance Index report is a bi-annual report released by the World Bank Group.
- The LPI covers 139 countries, measures the ease of establishing reliable supply chain connections and the structural factors that make it possible.
- The LPI analyses countries across six components viz.
 - Quality of trade and transport infrastructure
 - Competence and quality of logistics services
 - Efficiency of customs and border management clearance
 - Ease of arranging competitively priced shipments
 - Ability to track and trace consignments and
- Frequency with which shipments reach consignees within scheduled or expected delivery times.

INTERNAL SECURITY

INDIA-US KICK OFF AIR EXERCISE IN NORTHEAST'S PANAGARH

Why in news?

- Recently, India and the US began their bilateral air exercise 'Cope India 23' in the crucial Panagarh sector under the Eastern Command, home to XVII Corps, the India's only mountain strike corps aimed at China.



- The exercise will see transport aircraft and fighters in action.

Cope India 23:

- The bilateral air exercise between the IAF and the United States Air Force (USAF), aims to enhance mutual understanding between the two air forces and share their best practices.

Phase I:

- The first phase of the exercise commenced from Air Force Station Arjan Singh (Panagarh) and will also cover air force stations at Kalaikunda and Agra.
- The current phase will focus on air mobility and will involve transport aircraft and special forces' assets from both air forces.
- Both sides will field the C-130J and C-17 aircraft, with the USAF operating an MC-130J as well. The exercise also includes the presence of Japanese Air Self Defence Force aircrew, who will partake as observers.

Phase II:

- The second phase of the exercise would be held in Kalaikunda and will see the participation of the fighters. On the Indian side, the IAF will field the Rafale, Tejas and Su-30 MKI while the Americans are expected to bring in their F-15s, and two of their B-1 bombers.

Exercise Orion:

- India will also send its Rafale fighters to France in April 2023 to take part in their multilateral air exercise that will see the participation of the country's NATO allies.
- Orion is an exercise that is being hosted by France, involving many of its NATO and other important allies.
- This would be the first time when Rafales will fly off to take part in an exercise.

Iniochos-23:

- After this, the IAF will send in its Su-30 MKI for Iniochos-23, which is being hosted by Greece. Also participating will be the US, France, Italy, Jordan and Saudi Arabia among others.

About XVII Corps:

- The 17 Mountain Strike Corps is Indian Army's only strike corps that is responsible for carrying out offensive operations against China in case of a war.

- Its headquarters are located at Panagarh in West Bengal under Eastern Command. It is also known as Brahmastra Corps.
- The corps mascot is the Snow leopard, signifying strength, resolve and bravery - traits associated with the predator, with which it shares its geographical habitat.

L&T GETS ORDER TO BUILD PROTOTYPE OF LIGHT TANK FOR SINO-INDIA BORDER



Why in news?

- Recently, the Defence Research & Development Organisation (DRDO) and Larsen & Toubro (L&T) have joined hands to develop an indigenous light tank that is optimised for the extreme cold and high altitude of Ladakh and Arunachal Pradesh.
- Having co-designed an indigenous, 25-tonne, light tank, the DRDO has placed a development order on L&T to build the first prototype.

AoN:

- Meanwhile, the Defence Acquisition Council (DAC), the Ministry of Defence's (MoD's) apex body for capital purchases has granted an Acceptance of Necessity (AoN) for seven light tank regiments, each equipped with 45 tanks.
- The AoN requires L&T to build one regiment of light tanks, while the MoD acquires the other six regiments under the "Make" procedure.

Key Features:

- The light tank will have a hull, co-developed by DRDO and L&T, that will house an 800 horsepower (HP) engine optimised for high altitudes. The engine will be provided by German firm MTU, which is a subsidiary of Rolls-Royce.
- Mounted on this hull will be a 105-millimetre gun turret, procured ready-built from Belgian firm, John Cockerill.

ZTQ 105:

- The armoured challenge from the People's Liberation Army (PLA) in Ladakh is centred on China's new light tank, the agile and versatile ZTQ 105 also known as the Type 15 –developed by China's North Industries

Group Corporation (NORINCO) and unveiled during the Zhuhai Air Show in 2016.

- The ZTQ 105 has a 105-mm rifled gun that can destroy enemy tanks at ranges of two-to-three kilometres (km). It also fires anti-tank guided missiles to knock out tanks at ranges of five km.

T-72 and T-90 tanks:

- The Indian Army currently uses Russian T-72 and T-90 tanks on the Sino-Indian border. But these hefty, 42-45-tonne main battle tanks are designed for the plains. Movement is difficult for them on steep and narrow mountain roads.
- There are also limitations on how much their heavy 120-mm guns can be depressed or elevated, sometimes preventing them from engaging targets on hilltops or in valleys. That is why the Army took only small numbers of T-72 and T-90 tanks into Ladakh to counter the Chinese intrusions in 2020, and used them only sparingly.

Earlier light tanks used by Indian Army:

- In contrast, the Army has a formidable combat tradition of using light tanks in the mountains. In 1944, it used Stuart and Sherman tanks in the battle of Kohima. In 1948, these same tanks pushed back Pakistan forces in the Zoji-la pass.
- Against China in 1962, the Army used light AMX-13 tanks in the battle of Gurung Hill near Pangong Tso and deployed them in Bomdila and Dirang in Arunachal Pradesh.
- In the 1971 Bangladesh campaign, French AMX-13 and Soviet PT-76 tanks played a stellar role in the battle of Garibpur.

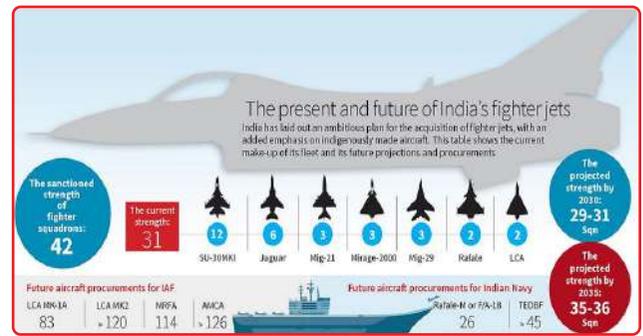
Situation post 2020:

- Although the K-9 Vajra artillery gun is designed for use in plains terrain, the Sino-Indian border tensions in 2020 saw a full regiment of these long-range, self-propelled guns deployed in eastern Ladakh, to increase the army's long-range firepower.
- Their successful deployment prompted the Army to consider diverting significant numbers of K-9 Vajras for use in mountainous terrain. This requires L&T to build 100 more K-9 Vajras; as well as induction of the Ordnance Factory Board's indigenous 155 mm, 45 calibre Dhanush howitzers, and imported M777 ultralight guns.
- To cater for this enhanced firepower, L&T has built 100 K-9 Vajras in Hazira, near Surat, with technology transferred from South Korean defence major Hanwha Defense. It handed over the 100th SP howitzer in February 2021.

Way Forward:

- Now the MoD is pursuing the "Vajra repeat programme", which requires L&T to build another 100 K-9 Vajra howitzers.

INDIA'S FIGHTER JET CONUNDRUM



Context:

- According to the Parliamentary standing committee on defence, against the sanctioned strength of 42 fighter squadrons, India is today at 31 squadrons which won't go up in the next decade, but on the contrary can go further down by 2029.
- This sums up the conundrum faced by one of the world's largest Air Forces in modernising its fleet which has been beset with unending delays in procurement.

Details:

- If what has been ordered is delivered, and the case for 114 Multi-Role Fighter Aircraft (MRFA) has progressed, then by 2030, IAF can be between 29 to 31 squadrons.
- The bulk of the heft to arrest the drawdown and ensure it doesn't fall below 29 squadrons rests on the 83 Light Combat Aircraft (LCA)— MK1A, LCA-MK2 and MRFA. The decision on MRFA is essential to arrest this drawdown.

Phase-outs:

- Of the 31 squadrons at present, the three Mig-21 squadrons will be phased by 2025. Also, the Jaguars, Mirage-2000s and Mig-29s will begin going out by the end of the decade.
- For instance, by 2027-28 the first of the MIG-29s, inducted in the late 1980s, will start going out and by early 2040s, when most of these types will be phased out, some of the earlier batch of SU-30s will also start going out.
- The IAF has in total contracted 272 SU-30s. A deal to procure 12 additional SU-30MKIs to replace the ones lost in accidents as well 21 additional MIG-29s from Russia has been stuck.

New acquisition:

- India has an ambitious plan lined up for the acquisition of over 500 fighter jets, a bulk of them to be indigenously designed and manufactured, with a majority of them being for the IAF. However, these are at various stages of development. Their manufacturing and timely deliveries are critical.
- Apart from the new inductions planned, the IAF is confident that increasing the low availability rates of

Su-30 and other fighters in service will offset some of the shortfall in the interim.

- However, that could be potentially impacted due to the Ukraine war, which has already affected payments to Russia for deals underway as well as delays and uncertainty in timely supply of spares for equipment in service.

Indigenous fighter ecosystem:

- The LCA which is the fulcrum of the indigenous jet development programme, originally intended as a Mig-21 replacement, has seen a series of delays and has now come back on track.
- The LCA achieved Initial Operation Clearance (IOC) in December 2013 and Final Operational Clearance (FOC) in February 2019. The IAF was supposed to get the 40 LCA from HAL much earlier but they are getting them now. Even now, it is two aircraft short of 40.

LCA-MK1A:

- Two decades since the first flight, in February 2020, the Defence Ministry signed a ₹48,000 crore deal with HAL for 83 LCA-MK1A. The project is on track to begin deliveries from February 2024.
- HAL will be delivering the first three aircraft in 2024 and 16 aircraft per year for the subsequent five years.

LCA-MK2:

- In addition to the LCA-MK1A, an even more capable and a larger LCA-MK2, which received sanction from the Cabinet Committee on Security (CCS) in September 2022 at a total cost of ₹9000 crore, is expected to be ready for production by 2027.
- Moreover, the fifth generation Advanced Medium Combat Aircraft (AMCA) is awaiting CCS sanction, the development of which would take 10 years after that. The project cost of AMCA is estimated to be around ₹15,000 crore.
- The LCA-MK2 will be similar to the Mirage-2000 in terms of capability and will be an important fillip as several jets currently in service begin going out.
- There is also a Twin Engine Deck Based Fighter (TEDBF) on the drawing board for the Navy's aircraft carriers.
- They are looking at six squadrons of LCA-Mk2, seven squadrons of AMCA and upto 100 TEDBF.

MRFA:

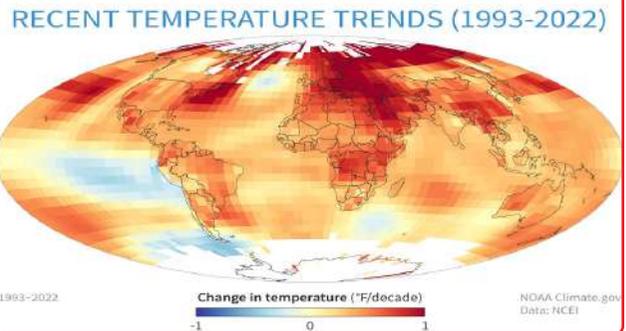
- The other critical programme, the MRFA, is a reincarnation of the earlier Medium Multi-Role Combat Aircraft (MMRCA) contest for 126 jets.
- The MMRCA began when the Request for Information (RFI) was issued in 2007 and dragged on for a decade only to end up in knots and give way to the emergency procurement of 36 Rafale jets, earlier shortlisted under the MMRCA, under a €7.87 billion deal with France.
- The RFI for 114 MRFA was issued in April 2019 to global aircraft manufacturers but there has been no progress and the project is yet to receive the

Acceptance of Necessity (AoN), the starting point of the procurement process.

- Given the huge budgetary outlays committed for the indigenous programmes, it has to be seen how the finances for the MRFA, which involves the manufacturer to set up plant in India, would be managed.

ENVIRONMENT

WHY WAS THE MONTH OF MARCH IN MUMBAI RELATIVELY COOLER?



Why in news?

- The month of March in Mumbai was relatively cooler and drier than normal.
- Winds in March usually tend to flow from West Asia to Mumbai, signalling the beginning of a sweltering heat and humidity build-up through May, before the rains arrive in June.

Why was this March cooler and drier?

- A study recently reported that West Asia has been warming more rapidly than other tropical land regions. The northern Arabian Sea has also been warming.
- The combination of this land and ocean warming has enhanced the duration, frequency, and intensity of heat waves over India in the pre-monsoon season.
- Meteorologists have also blamed the northern Arabian-Sea warming for the increase in heavy rainfall events over northwest India in the monsoon season.
- Rapid warming over West Asia produces low sea-level pressure locally, which sets up a northward pressure gradient over the Arabian Sea, from the equator to its northern waters. This gradient pulls winds northward, disrupting those that should actually be flowing east, from West Asia towards Mumbai.
- So the winds came to Mumbai from the north-northwest, bringing cooler and drier air instead of the usual hot and humid air from the desert.

Will this affect monsoons?

- These wind changes created an unusual anticyclone over the Arabian Sea in March. An anticyclone has clockwise ocean circulation in which warm waters

converge. As a result, sea surface temperatures warmed by over 1° C just during March.

- A warmer Arabian Sea in the pre-monsoon season tends to favour a good monsoon. On the other hand, 2023 is expected to be an El Niño year, and an El Niño tends to suppress the monsoon, especially when it follows a La Niña winter, which was the case in 2022.

Heat waves:

- As seasonal land-heating continues into April and May, the southwesterly winds will set out from the equator into the central Arabian Sea. The normal eastward winds from West Asia towards Mumbai should also get stronger.
- These westerly winds bring heat from West Asia, over the warm Arabian Sea, into India. Winds also sweep in from the northwest over the mountains of Afghanistan and Pakistan, setting up heat waves.
- The evolution of winds and sea surface temperatures clearly show a rapid warming of the North Indian Ocean, especially the Arabian Sea, which augurs even more heat events.

What will be the consequences?

- Reports of unseasonal rain and hail leading to devastating crop damages in the northwest are a preview of what may be in store in terms of heat waves and heavy rain over these parts. Since only about 50% of El Niño years have so far produced a drought over India, it may end up with a 'normal' monsoon.
- But it is quite likely that warming over West Asia plus the Arabian Sea is going to once again produce heavy rainfall events over northwest India and Pakistan.
- While Mumbaikars are basking in the unseasonably cool and dry weather, they can also expect heavy rains and flooding this monsoon. Climate models seem confident that there will be an El Niño starting during the monsoon season.

DEEP OCEAN CURRENTS NEAR ANTARCTICA ON THE VERGE OF COLLAPSING: RESEARCH



Why in news?

- Scientists believe that the deep ocean circulation that forms around Antarctica is on the verge of collapsing.

- Such a decline of this ocean circulation will stagnate the bottom of the oceans and generate further impacts affecting climate and marine ecosystems for centuries to come.

Antarctic overturning:

- Cold water that sinks near Antarctica drives the deepest flow of the overturning circulation, a network of currents that spans the world's oceans.
- The overturning carries heat, carbon, oxygen and nutrients around the globe. This influences climate, sea level and the productivity of marine ecosystems.
- The modelling shows that if global carbon emissions continue at the current rate, then the Antarctic overturning will slow by more than 40 per cent in the next 30 years and on a trajectory that looks headed towards collapse.

Modelling the deep ocean:

- About 250 trillion tonnes of cold, salty, oxygen-rich water sinks near Antarctica each year. This water then spreads northwards and carries oxygen into the deep Indian, Pacific and Atlantic Oceans.
- The international team of scientists modelled the amount of Antarctic deep water produced under the IPCC 'high emissions scenario', until 2050.
- The model captures detail of the ocean processes that previous models haven't been able to, including how predictions for meltwater from ice might influence the circulation.
- This deep ocean current has remained in a relatively stable state for thousands of years, but with increasing greenhouse gas emissions, Antarctic overturning is predicted to slow down significantly over the next few decades.

Impacts of reduced Antarctic overturning:

- With a collapse of this deep ocean current, the oceans below 4000 metres would stagnate. This would trap nutrients in the deep ocean, reducing the nutrients available to support marine life near the ocean surface.
- The model simulations show a slowing of the overturning, which then leads to rapid warming of the deep ocean.
- The study found melting ice around Antarctica makes the nearby ocean waters less dense, which slows the Antarctic overturning circulation. The melt of the Antarctic and Greenland ice sheets is expected to continue to accelerate as the planet warms.

PELICANS, MANGROVES, AND SALT MARSHES

Context:

- The Island of Sriharikota serves as a barrier that shields a brackish water lagoon, the Pulicat Lake.
- Being mostly off-limits to tourists because it is an ISRO launch site, this area is teeming with 76 species of water birds. The lake itself has an average depth of only one metre, although it is nearly 60 km long.



Spot-billed pelican:

- ⇒ The tidal flats and both fresh and brackish water wetlands found here are ideal for the spot-billed pelican.
- ⇒ Although classified as 'Near-Threatened' in the IUCN red list, this bird looms large in our minds when we think of water birds.

Characteristics:

- ⇒ The spot-billed pelican's comical walk points to weak leg muscles, which also means that the bird is not a great swimmer, and catches fish near the surface of the water. The common name comes from blue spots on the sides of the large bills.
- ⇒ A social bird, this species sometimes goes fishing in groups, forming a semi-circle that pushes the fish towards shallow water. It also forms a foraging partnership with the little cormorant.
- ⇒ Cormorants are divers, and their dives cause the fish present in deeper regions to scatter towards the surface, where the pelican awaits them.
- ⇒ Adult spot-billed pelicans weigh 4.5-5 kg. The pouch, which is called the gular, is for catching fish. In the breeding season, the adult may bring home 2 kg of fish in one catch.

Breeding colonies:

- ⇒ Spot-billed pelicans form stable colonies along with other water birds. Nests are built on trees, and two-three eggs are laid. When they are about a month old, the chicks destroy the nests.
- ⇒ Breeding colonies occur very close to, or even within villages, and the birds do not seem perturbed by human activity, and the villagers welcome and protect the pelicans and the nests.
- ⇒ Villagers use the droppings of the spot-billed pelican as a fertilizer. After the breeding season, pelican populations scatter over a very large area as they forage for food.

Breeding sites:

- ⇒ A detailed survey of spot-billed pelican populations placed a crude estimate of their number in India at 6,000-7,000.
- ⇒ The survey identified breeding sites for these birds in South India at Karaivetti-Vettangudi near Thanjavur and Koonthankulam near Tirunelveli in Tamil Nadu,

Kokkarebellur (Mandya District) and Karanji Lake (Mysuru city) in Karnataka, and Uppalapadu near Guntur and Nelapattu near the Pulicat lake in Andhra Pradesh.

- ⇒ Andhra Pradesh has recently lost a large breeding colony of the bird at the Kolleru lake, where aquaculture has contributed to a total degradation of the ecosystem.

Pulicat lake:

- ⇒ The Pulicat lake, now a salty marsh, was a thick mangrove forest in the 16th century.
- ⇒ Wetland ecosystems lock up carbon dioxide from the atmosphere, as 'Blue Carbon'. As carbon sinks, mangroves can store 1,000 tonne of carbon per hectare.

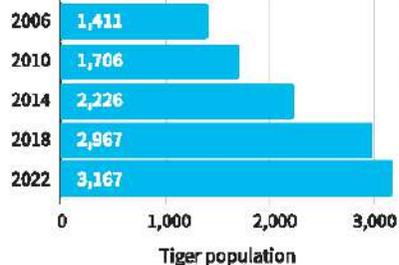
Ramsar sites:

- ⇒ Wetlands of global importance are called Ramsar sites, after the city in Iran where the Treaty on Wetlands was signed.
- ⇒ India has 75 Ramsar sites, of which 14 are in Tamil Nadu, including three added in 2022: the Karikili bird sanctuary, the Pallikaranai Marsh Reserve Forest and the Pichavaram mangrove. The spot-billed pelican is seen in all these places.

INDIA'S TIGER POPULATION TOPS 3,000, SHOWS CENSUS

Big cat count

According to the data released by the PM, the number of tigers in India increased by 200 in the past four years. A look at the tiger population



Steady rise: A tiger at Van Vihar National Park in Bhopal on Sunday. PTI

Why in news?

- ⇒ India has at least 3,167 tigers, according to estimates from the latest tiger census.
- ⇒ The tiger population numbers were made public by Prime Minister in Mysuru, at an event to mark the International Big Cat Alliance conference and the 50th anniversary of Project Tiger.
- ⇒ There were 2,967 tigers recorded in 2018, and 2,226 in 2014. The figures were provisional and could be revised.

Growth pattern:

- ⇒ The tiger population has grown the most in the Shivalik hills and the Gangetic flood plains,

followed by central India, the northeastern hills, the Brahmaputra flood plains, and the Sundarbans.

- There was a decline in the Western Ghats numbers, though "major populations" were said to be stable.
- The tiger numbers are estimated by adding animals caught in camera traps, and those that may not have been captured in this way. The latter are estimated by statistical techniques.

Mean value:

- In their four-year estimates, the scientists provide a range of the estimated tiger population, and the mean value is highlighted as the latest tiger population.
- For instance, in 2018, the tiger population was a minimum of 2,603 and a maximum 3,346 with a mean value of 2,967.

Challenges:

- The current estimate also does not give numbers on the proportion of tigers outside protected areas, which are a growing number and a key marker of the environmental threats as well as man-animal conflicts.
- However, the census report warn that nearly all of the five major tiger-zones face challenges to the growth of the tiger population due to the increasing demands from infrastructure development.
- Since 1973, when Project Tiger was established, the number of dedicated tiger reserves has grown from nine reserves covering 18,278 square km to 53 reserves spanning 75,796 square km, which is roughly 2.3% of India's land area.
- However, most of the country's tigers are focused within a handful of reserves which are fast approaching their peak carrying capacity, and unless new regions are developed as reserves, it may be a challenge to ensure further growth in numbers.

What's next?

- Following the translocation of cheetahs from Africa, India is now looking at international initiatives to translocate tigers into other locations.
- It is in talks with Cambodia, where the tiger has gone extinct due to poaching, to create a suitable habitat there and ship a few tigers from India to revive the big cat's population in that country.

HOW HAVE RECENT WEATHER EVENTS AFFECTED WHEAT CROP?

Why in news?

- The unusual rise in mercury in February 2023, followed by an untimely spell of widespread rain accompanied by gusty winds and hails during the month of March in parts of the India.
- The farmers in key wheat producing States Punjab, Haryana, Madhya Pradesh, Uttar Pradesh, Rajasthan, Bihar and Gujarat are worried as they anticipate a drop in yield (productivity), output (production) and quality.



How will the rains affect wheat crop?

- According to the India Meteorological Department (IMD), fairly widespread rains along with stormy winds between 40-50 kilometers per hour lashed several parts of the major wheat-growing States in the country during March, under the influence of consecutive western disturbances.
- Rain spells accompanied by winds are not considered to be a good sign for the crop's health if they are close to the ripening and harvesting stage, especially if there are instances of water logging in the fields.
- Unfortunately, there have been instances of crop flattening in fields, besides water logging, which could be detrimental for the ready-to-harvest wheat crop.
- Wheat, a key rabi (winter) crop is sown between late October till December; it nears the ripening stage in the month of mid-March, and harvesting of the early sown varieties usually commences by the end of March itself.

How much output would be affected?

- Agriwatch, an agri-commodity research firm, in its latest report has stated that owing to the recent untimely rains, the country's wheat production in the agriculture year 2022-23 is likely to be 102.9 MT which is less than the Union government's estimate of 112 MT.
- The Centre, however, is optimistic that wheat production would be close to 112 MT on account of an increased acreage (area) of wheat and better yield this season, despite a slight production loss due to recent adverse weather conditions.
- As per the government, the average wheat acreage in 2023 (2022-23) has been 14,86,240 hectares more in comparison to the last five years (2017-2021) which stood at 30,382,010 hectares.

What are agri-experts saying?

- A sizable section of farmers assert that the inclement weather has adversely damaged the standing wheat crop.
- Moreover, if the country's wheat production drops below the government estimate it could lead to a hike in prices of wheat and wheat-based products in the domestic market.

- ⇒ Any decline in wheat production can also lead to a potential foodgrain security issue.

IMD FORECASTS A 'NORMAL' MONSOON, EVEN AS EL NINO LOOMS LARGE



Why in news?

- ⇒ India's four-year run of munificent summer monsoon rainfall is likely to end in 2023, with the India Meteorological Department (IMD) forecasting a 4% shortfall in the coming monsoon season.
- ⇒ Though still categorised as 'normal', it is at 96% of the Long Period Average (LPA). Most recently, it was in 2017 that the IMD forecast 96% in April, for the monsoon, and India saw a 2.6% shortfall.

Factor responsible:

- ⇒ The key factor believed to be playing spoilsport is the development of 'El Nino', a cyclical phenomenon of warming in the central Pacific that in six out of ten years is linked to diminished rainfall in the country's west, northwest and in western parts of central India.
- ⇒ Since 2019, India has been under the influence of the converse 'La Nina' or a cooling in those regions, and therefore, getting substantial monsoon rains.
- ⇒ In 2019 and 2020, for instance, India saw monsoon rains over 10% and 11% of the 87 cm LPA (a 50-year average from 1971-2022). Last year saw 6% more rains than what is usual. 'Normal' monsoon rainfall over India during June-September is 87 cm (considered 100% of the LPA) though this involves wide spatial variability.
- ⇒ Anywhere from 96-104% of the LPA is considered 'normal' with 90-95% considered 'below normal' and less than 90% marked as 'deficient.'

'El Nino' effect:

- ⇒ From 1951-2022, there have been 15 'El Nino' years, defined as a greater-than-half-degree Celsius rise in temperatures in the central, equatorial Pacific Ocean with nine of those years witnessing 'below normal' rains. In 2015, the last 'strong' El Nino year (>1.5 C rise), monsoon rains shrivel by 14%. A 'weaker' El Nino (a sub-1C rise) in 2018 saw a contraction of 7.4%.
- ⇒ Experts say that while 'El Nino' conditions are imminent, there are ameliorating factors that may

blunt its impact. One, 'El Nino' is only likely to begin to take root in the second half of the monsoon season – August and September.

- ⇒ The weather models also indicate the development of a 'positive' phase of the Indian Ocean Dipole (IOD, or warmer temperatures in the Arabian Sea and hence more moisture and rainfall over India) during these months and so, a somewhat reduced impact of the 'El Nino'.
- ⇒ Another factor that could blunt the 'El Nino' is reduced snow cover in Eurasia.
- ⇒ In 1997, despite a 'strong' 'El Nino', monsoon rainfall turned out to be 2% more than normal and this was due to favourable IOD conditions.

Cultivation concerns:

- ⇒ India's kharif sowing, which begins in June, is extremely dependent on monsoon rainfall.
- ⇒ In recent years, the IMD has started to place greater emphasis on the 'dynamical' monsoon forecast techniques where global atmospheric and ocean conditions are simulated on powerful supercomputers to forecast climate conditions.
- ⇒ This is different from the traditional, statistical approach where 8-10 meteorological factors, such as Eurasian snow cover and Arabian Sea surface, are correlated to the monsoon rainfall in past years to forecast a coming year's monsoon.

What is La Nina?

- ⇒ La Nina is abnormal cooling of the central and eastern Pacific Ocean waters off the coasts of Ecuador and Peru.
- ⇒ Such cooling (Sea surface temperature (SST) falling 0.5 degrees Celsius or more below a 30-year average for at least five successive three-month periods) is caused by strong trade winds flowing west along the Equator, taking warm water from South America towards Asia.
- ⇒ The warming of the western equatorial Pacific causes enhanced evaporation and concentrated cloud-formation activity around that region, with consequences for India as well.
- ⇒ The latest La Nina event lasted from July-September 2020 to December-February 2022-23, making it one of the longest ever.

El Nino:

- ⇒ During El Nino, the trade winds diminish or even change direction, blowing from east (South America) to west (Indonesia). Warm water masses migrate into the central and eastern equatorial Pacific Ocean as the winds blow from west to east.
- ⇒ As a result of the rise in SSTs, rainfall increases in western Latin America, the Caribbean, and the US Gulf Coast, whereas convective currents are cut off in Southeast Asia, Australia, and India.

Long-Period Average (LPA)

- ⇒ IMD uses the long-period average (LPA) to determine if the rainfall is normal, below normal, or above normal.
- ⇒ The LPA, is the rainfall recorded over a particular region for a given interval (like a month or season) averaged over a long period like 30 years, 50 years, etc.
- ⇒ Usually, in India, a 50-year LPA covers large variations on either side caused by years of unusually high or low rainfall due to El Nino or La Nina.
- ⇒ India defines average, or normal rainfall as between 96 per cent and 104 per cent of a 50-year average with 88 centimetres (35 inches) of rainfall for the four-month season beginning June. IMD maintains LPAs for the entire country on a national and local level.

Indian Ocean Dipole (IOD):

- ⇒ It is defined by the difference in sea surface temperature between two areas (or poles, hence a dipole) – a western pole in the Arabian Sea (western Indian Ocean) and an eastern pole in the eastern Indian Ocean south of Indonesia.
- ⇒ The IOD affects the climate of Australia and other countries that surround the Indian Ocean basin, and is a significant contributor to rainfall variability in this region.

NEW FROG SPECIES FOUND IN MEGHALAYA SIJU CAVE



Why in news?

- ⇒ Researchers from the Zoological Survey of India (ZSI) have discovered a new species of frogs from deep within the Siju cave in the South Garo Hills district of Meghalaya.
- ⇒ Siju is a four-kilometre-long natural limestone cave.

Cascade Frogs:

- ⇒ They named the new cascade ranid species *Amolops siju* after the cave from where this discovery was made.
- ⇒ Cascade Frogs are named so because of their preference for small waterfalls or cascades in flowing hill streams.

Key Highlights:

- ⇒ The genus *Amolops* is one of the largest groups of ranid frogs (family Ranidae) with currently over 70 known species that are widely distributed across northeast and north India, Nepal, Bhutan, China, through Indochina, to the Malaya Peninsula.
- ⇒ The discovery of new species from a cave is very rare.
- ⇒ This is the second time such a discovery has been made in India, the first being the discovery of the *Micrixalus spelunca* in 2014 from a cave in Tamil Nadu.

Background:

- ⇒ The specimens of *Amolops siju* were collected in January 2020 during a cave expedition by the ZSI team. The tissue samples of the specimen were subjected to molecular studies to ascertain their specific identity from the other known species of cascade *Amolops* frogs.
- ⇒ Although the specimens were collected 60-100 metres from the cave entrance and the dark zones beyond 100 m of the cave entrance, they did not find any troglobitic or cave-adapted modification, suggesting that this species of frog is not a permanent resident of the shelter.

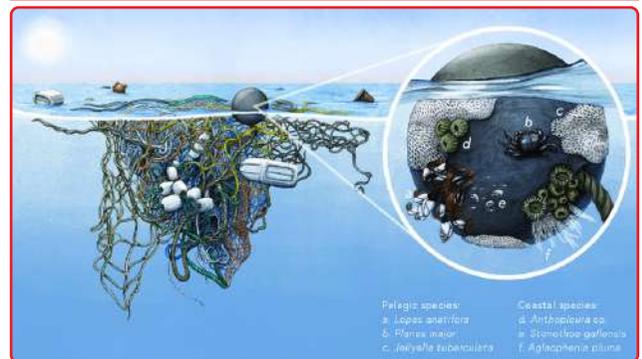
Earlier Findings:

- ⇒ This is the fourth new species of a cascade frog (*Amolops*) published by the same team recently.
- ⇒ *Amolops chanakya*, *Amolops terraorchis* and *Amolops tawang* were discovered in Arunachal Pradesh.

Way Forward:

- ⇒ Siju cave is currently known to harbour more than 100 animal species, mostly invertebrates like cave crickets, spiders, beetles, earthworms, among other.

HOW COASTAL SPECIES ARE LIVING ON PLASTIC DEBRIS IN THE OCEAN?



Why in news?

- ⇒ In a recent study, researchers from Canada, the Netherlands, and the U.S. have reported that coastal lifeforms have colonised plastic items in the Great Pacific Garbage Patch.

The Great Pacific Garbage Patch:

- There are some water currents in the ocean that, driven by winds and the Coriolis force, form loops. These are called gyres.
- The North Pacific Subtropical Gyre (NPSG) is one such, located just north of the equator in the Pacific Ocean. It consists of the Kuroshio, North Pacific, California, and North Equatorial currents and moves in a clockwise direction.
- These currents flow adjacent to 51 Pacific Rim countries. Any trash that enters one of these currents, from any of these countries, could become part of the gyre.
- Inside this gyre, just north of Hawai'i, lies a long east-west strip where some of the debris in these currents has collected over the years. The eastern part of this is the Great Pacific Garbage Patch. It is, per one estimate, 1.6 million sq. km big and more than 50 years old.
- It contains an estimated 45,000-1,29,000 metric tonnes of plastic, predominantly in the form of microplastics.
- The numerical density of plastics here is around four particles per cubic metre. Mass-wise, however, heavier, more visible objects that haven't yet broken down into smaller particles accounted for 92% of the plastics in 2018.

Findings of the study:

- The tsunami off the Japanese coast in 2011 contributed to the debris in this garbage patch. Until at least 2017, researchers had found debris washing ashore on the West coast of North America containing live lifeforms originally found in Japan.
- From November 2018 to January 2019, researchers collected 105 pieces of plastic debris from the eastern part of the NPSG, "the most heavily plastic-polluted ocean gyre on the globe".
- Based on studying them, they reported that 98% of the debris items had invertebrate organisms. They also found that pelagic species (species of the open ocean) were present on 94.3% of them and coastal species on 70.5%. That is, organisms found on coasts were getting by on small floating islands of garbage (to humans) out in the Pacific Ocean.
- In all, they found organisms belonging to 46 taxa. While 37 of them were coastal, the rest were pelagic. Among both coastal and pelagic organisms, crustaceans were the most common. The coastal species were most commonly found on fishing nets whereas the pelagic species on crates.

Where were the organisms from?

- According to the them nearly all taxa were of Northwest Pacific origin, including Japan.
- Similarly, "most debris items (85.7%) did not have identifiable markings linked to origin, such as manufacture locations or company/brand names."

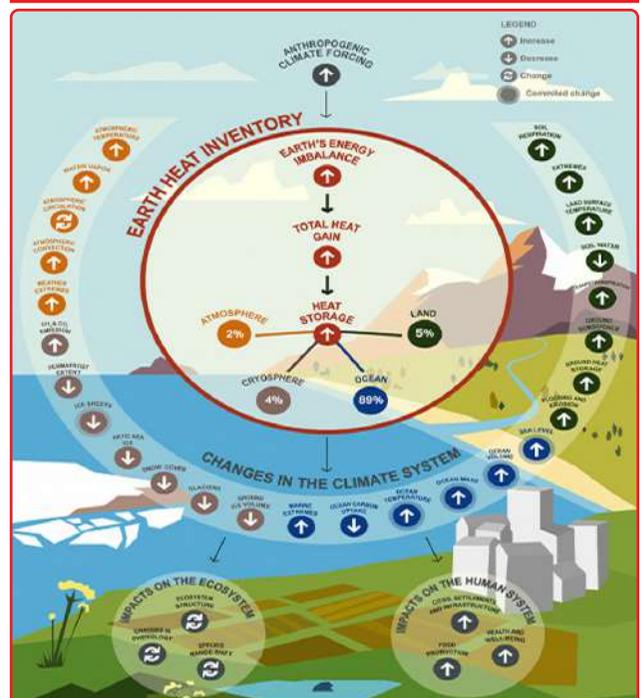
However, eight of the remainder were from East Asia and five specifically from Japan. Four items were from North America.

- The researchers found that 68% of the coastal taxa and 33% of the pelagic taxa reproduced asexually, while there was evidence of sexual reproduction among the hydroids and the crustaceans, among others.
- They reported a strong positive correlation between reproduction and mobility.

Neopelagic community:

- According to the, the introduction of a vast sea of relatively permanent anthropogenic rafts since the 1950s" has given rise to a new kind of "standing coastal community in the open ocean. They've named it the neopelagic community.
- While coastal species have been found on human-made objects in the open ocean before, they were always considered to have been "misplaced" from their intended habitats. The neopelagic community, on the other hand, is not misplaced but lives on plastic items in the garbage patch, including reproducing there.
- In an another study, researchers reported that polyethylene films had chemically bonded with rocks in China. This, in turn, is reminiscent, of the "anthropoquinas" of Brazil (sedimentary rocks embedded with plastic earrings) and the "plastiglomerates" of Hawai'i (beach sediment + organic debris + basaltic lava + melted plastic).

OCEANS ABSORB 90 PERCENT OF HUMAN-INDUCED PLANET WARMING, STUDY



Why in news?

- Human-induced climate change is skewing Earth's energy balance and oceans are bearing the brunt of the heat accumulation, according to a new study.

Key Highlights:

- About 89 per cent of the warming in the last 50 years has been absorbed by the ocean and the rest by the land, cryosphere and atmosphere.
- About 381 zettajoules (ZJ) of heat accumulated on the planet from 1971-2020 due to anthropogenic emissions. One ZJ is equal to 10 to the power of 21 joules.
- This roughly equals a heating rate (Earth Energy Imbalance or EEI) of approximately 0.48 watts per square metre.
- About 89 per cent of the accumulated heat is stored in the ocean, six per cent on land, a per cent in the atmosphere and about four per cent available for melting the cryosphere.

Earth Energy Imbalance:

- EEI is the difference between incoming and outgoing solar radiation.
- It is an indicator of climate change that provides an estimate of how much, how fast, and where the Earth's climate is warming, as well as how this will evolve in the future.

Impact of increment in heat:

- Researchers from several institutions updated the Earth's heat inventory from a 2020 study to monitor climate change and provide community-based recommendations.
- The experts calculated that between 2006 and 2020, the EEI was 0.76 watts per square metre with a variable of ± 0.2 . The Earth will keep gaining energy, increasing planetary warming if the energy imbalance continues to exist or increases.
- Heat accumulated on land drives up ground surface temperatures. This may increase soil respiration, which triggers the decomposition of soil organic matter and plant litter by soil microbes, releasing carbon dioxide in the process.
- Higher soil respiration will likely decrease soil water, depending on climatic and meteorological conditions and factors.
- Heat storage within inland water bodies has increased to roughly 0.2 ZJ since 1960. For permafrost thawing, it was about 2 ZJ.
- The accumulation of heat in inland water increases lake water temperatures. This makes conditions ripe for algal blooms. Permafrost heat content could inject methane and carbon dioxide into the atmosphere, the researchers warned.

Ocean and troposphere:

- The upper ocean (0–300 and 0–700 metres depth) has taken up a major fraction of heat.

- The heat content from the surface to the bottom between 1960-2020 was roughly 0.14 watts per square metre. In the most recent period (2006-2020), the heat content was estimated to be approximately 0.68 watts per square metre.
- During 2006–2020, ocean warming rates for the 0–2,000 metres depth reached record rates of roughly 1.03 watts per square metre.
- The troposphere, the lowest layer of the atmosphere of Earth, measuring 8-14 kilometres in thickness, is also warming up due to increased heat accumulation.
- The upper troposphere in the tropics has warmed faster than the near-surface atmosphere since at least 2001.

Cryosphere:

- The cryosphere, the frozen water part of the Earth system gained roughly 14 ZJ of heat from 1971–2020.
- Half of the uptake triggered the melting of grounded ice, while the remaining half is linked to the melting of floating ice (ice shelves in Antarctica and Greenland, Arctic Sea ice).
- Antarctic Ice Sheet, including the floating and grounded ice, contributed about 33 per cent to the total cryosphere heat gain.
- Arctic sea ice stood second, having contributed 26 per cent. Melting glaciers and the Greenland ice sheet was responsible for 25 per cent and 17 per cent. The Antarctic Sea ice accounted for about 0.2 per cent.

90 PERCENT OF INDIA IS IN DANGER RANGE OF HEATWAVE IMPACTS, SAYS STUDY**Why in news?**

- Heatwaves across the globe are rising by the day, thus becoming more lethal and intense due to climate change.
- April 2022 stands as the hottest summer witnessed in 122 years, leading to at least 25 deaths. The cumulative heatwave-related mortality in India is over 24,000 deaths since 1992, as per PLOS Climate.

Heatwaves:

- As of now, nearly 90% of the country lies in the danger zone and almost all of Delhi is undergoing severe impact from the heatwave.

- In 2022, from the month of January to October, the country recorded extreme heat condition on 242 days out of 273, which include co-occurrence of heatwave as well as coldwaves.
- In India, heatwaves have known to occur particularly in the period of March to June. On an average, about two to three heatwaves take place every season.
- Climate change and global warming have increased the probability of heatwaves in the past three decades.

Impact:

- These heatwaves are bound to affect the country's progress towards its Sustainable Development Goals (SDGs).
- India has committed to achieving 17 United Nations Sustainable Development Goals, including eliminating poverty, promoting good health and wellbeing, decent work and economic growth, quality education, among others.

Climate vulnerability of India:

- In order to analyse the climate vulnerability of the country, and how climate change may impact SDG progress, the scientists compared India's heat index (HI) with its climate vulnerability index, (CVI), using various indicators to account for socioeconomic, livelihood, and other biophysical factors.
- PLOS Climate used a dataset that was publicly available on state level climate vulnerability indicators from the Indian Government's National Data & Analytics Platform.
- The progress of the SDGs was measured amidst these rising heatwaves, the results of which showed that in the last 20 years, from 2001 to 2021, the progress of SGD with respect to the mortality due to these extreme weather conditions stated that while the effect of extreme weather events has intensified, the pace of SDG progress is slower.
- From 2019 to 2021, India's global SGD rank is seen to be declining because the country failed to achieve the targets for 11 out of 17 SGD, out of which most were critically related to taking action towards climate change.

Assessment of Delhi Govt.

- The assessment by the Delhi government states that South and North-east Delhi are highly vulnerable areas, most susceptible to the impacts of climate change. However, the analysis by PLOS Climate states that the entire city is in the danger zone of HI levels.
- India ranks Delhi as the second best performer in terms of UN-SGD progress, but with the risk that its HI carries, this ranking is highly threatened.

Way Forward:

- So far, India has demonstrated impeccable leadership in creating heat action plans in the past 5 years through disaster management and providing relief resources.

- Along with these, many states have even begun to adopt the new guidelines for prevention and management of the ever rising heatwaves.

WHAT IS 'HEAT DOME'?



Why in news?

- Recently, places across the southwest and eastern parts of the United States recorded temperatures as warm as those seen in late June or early July, and the unusual warming was caused by a phenomenon known as 'heat domes'.
- 'Heat domes' are natural phenomena that have also been associated with unusually warm periods in India, Bangladesh, China and some other Asian countries.
- This season's first heat dome set off heatwaves in as many as 48 states in the US and fears of wildfires loom large.

What is a heat dome?

- A heat dome is a type of high-pressure system that forms over a large area in the atmosphere, and causes extremely hot and dry weather conditions. The system traps hot air and prevents it from flowing to rise and cool. This air then becomes compressed and heats up, leading to a dome-shaped area of hot air that can persist for several days or even weeks.
- Heat domes can cause dangerous heat waves causing the temperatures to shoot up.
- In addition to temperatures which are highly unfavourable for humans, they can also lead to drought conditions and wildfire as the hot and dry weather can quickly dry out vegetation and make it more susceptible to catching fire.
- Due to climate change, heat domes have not only become more frequent but also a lot more intense. The rising temperatures and changes in weather patterns are creating conditions that are assisting their formation.
- While many people use 'heat domes' and 'heat waves' interchangeably, heat domes are just one of the atmospheric conditions that can contribute to the formation of a heat wave.
- A heat wave is a prolonged period of excessively hot weather, often accompanied by high humidity. Heat

waves can occur for a variety of reasons, including the presence of a heat dome.

What causes a heat dome?

- A number of meteorological elements work together to create a big high-pressure system in the atmosphere, which is what creates a heat dome.
- Climate change has led to warmer background temperatures, exacerbating the high-pressure system. Regions that have become drier due to the same, can also create conditions that are beneficial to the formation of heat domes. Additionally, as the icebergs melt, the temperature and moisture patterns in the surrounding regions are influenced.
- However, while these factors can create conditions for a heat dome to form, the intensity and duration of a heat dome can also be influenced by other factors, such as the amount of moisture in the air and the presence of other weather systems.

How does a heat dome impact the world?

- Heat domes can have significant impacts on human health, particularly vulnerable populations such as elderly individuals, children and those with pre-existing health conditions that can be aggravated by extreme heat.
- Construction workers, farmers and agricultural workers, who work outdoors for long hours, are at increased risk of heat-related illnesses due to their prolonged exposure to high temperatures.
- People living in poverty are also more susceptible to the fatalities of heat domes as their houses are often built with heat-trapping surfaces such as concrete and asbestos.
- Heat exhaustion occurs upon exposure to high temperature for extended periods of time, and can be characterised by symptoms such as dehydration, dizziness and nausea.
- In more severe cases, heat exhaustion can progress to a heat stroke, a medical emergency that can cause organ damage and even death.
- Hot weather can also put stress on the heart and lungs, particularly for those with pre-existing conditions like asthma or heart disease. Heatwaves have also been associated with increased rates of heart attacks, strokes and respiratory illnesses.

How to combat heat domes?

- Reducing greenhouse emissions: Transitioning to renewable energy sources, improving energy efficiency and promoting sustainable transportation, can be measures in achieving a reduction of greenhouse gas emissions, as it is critical to mitigating the impacts of heat domes in long terms.
- Investing in green infrastructure: Cities can invest in green infrastructure, such as parks, green roofs, and tree planting, which can help reduce the urban heat island effect and provide cooling benefits.

- Implementing building codes and standards: Building codes and standards can help ensure that new buildings are designed to withstand extreme heat and maintain indoor comfort during heat waves.
- Reducing heat-trapping surfaces: Cities can take steps to reduce the amount of heat-trapping surfaces, such as asphalt and concrete, which can exacerbate the urban heat island effect.
- Enhancing public education and outreach: Educating the public about the risks of extreme heat and how to stay safe during heat waves can help reduce the incidence of heat-related illness and mortality.

TREES, CROPS ENDEMIC TO INDIA CAN HELP COMBAT AIR POLLUTION: STUDY



Why in news?

- Certain trees and crops which are endemic to India can help lower the impact of air pollution by absorbing and filtering pollutants, according to a new study.

Details:

- Trees such as pipal, neem, mango and crops like maize, pigeon pea and safflower are best suited for areas with higher levels of air pollution.
- These trees exhibited the highest air pollution tolerance index (APTI) values during a study conducted in Patna, Bihar.
- APTI and anticipated performance index are tools used to assess the tolerance capacity of tree and crop species against air pollution.

Focus:

- Researchers from the Indian Council of Agricultural Research analysed crops and trees that are most common in the eastern region of India.
- They studied 19 tree and crop species from five different locations in Patna to assess the impact of air pollutants on the biochemical parameters.

Key Observations:

- Different trees and crop species responded differently towards air pollution. The level of ascorbic acid in plants determines their tolerance against the adverse effect of oxidising pollutants.
- Ascorbic acid levels were higher in peepal, followed by mango trees.

- Among cereals, ascorbic acid levels were found to be the highest in maize.
- In oilseeds, safflower and flax seeds had similar levels of ascorbic acid.
- Among pulses, the pigeon pea had the highest ascorbic acid content, followed by the Indian pea.

Recommendations:

- Patna city in the Indo-Gangetic belt is one of India's most polluted cities. There is a need to focus more on mitigating air pollution and its remediation. One of the best remedies for this is urban forestry and agriculture.
- Most cities in the region recorded a rising trend in annual particulate matter (PM) 2.5 level in 2021.
- Bihar pollution control board's action plan to control air pollution recommended the creation of a green belt in and around Patna and planting trees like neem, sheesham, peepal, keekar and gulmohar to make the air clean and healthy.

SCIENCE & TECHNOLOGY

THE MORATORIUM CALL ON CHATGPT'S SUCCESSOR



Why in news?

- Recently, Elon Musk and a group of AI experts signed an open letter calling for a moratorium on developing artificial intelligence (AI) systems that are more powerful than OpenAI's recently launched large language model (LLM), GPT-4.
- The letter, which at the time of writing had over 1,300 signatories, called on all AI labs to immediately pause, for at least six months, training of any systems more powerful than GPT-4.

What does the letter say?

- Citing one of the Asilomar AI principles on how advances in AI could profoundly impact people's lives, the Future of Life Institute (FLI) issued letter noted that "AI labs are locked in an out-of-control race to develop and deploy ever more powerful digital minds that no one, not even their creators can understand, predict, or reliably control."

- The Asilomar AI Principles are one of the earliest sets of AI governing principles laid out at the Beneficial AI 2017 conference hosted by FLI.

What is the context?

- FLI's open letter comes amid rapid development and deployment of AI technology in several industries. Since OpenAI dropped its generative pre-trained (GPT) chatbot in November, allowing people to freely interact with ChatGPT, there has been a dramatic rise in adoption of AI by many firms.
- The Microsoft-backed chatbot wowed people with its instant, and often apt, replies. It could correct software codes, and explain almost everything on the Internet.
- Roughly three months after its launch, the company allowed developers to integrate ChatGPT's API with their applications for a fee. Enterprise version of the chatbot, called ChatGPT Plus, has already been integrated by Snapchat, Unreal Engine and Shopify in their applications.
- Such rapid adoption by businesses is heating up competition. Google has taken up the gauntlet. The Alphabet-owned company launched Bard, a version of its Lamda language model.
- In China, Internet giant Baidu has launched Ernie, an AI-powered chatbot than can summarise financial statements.
- Separately, the Massachusetts Institute of Technology's media lab has developed ELSA, an AI bot that can act as a psychotherapy counsellor. It could potentially be deployed in cognitive behavioural therapy sessions.

Why does FLI's letter focus on GPT-4?

- In March, OpenAI launched its most advanced LLM yet: GPT-4. This model has been trained on a trillion parameters, compared to ChatGPT's 175 billion parameters. Having access to such a large dataset allows GPT-4 to learn and understand complex patterns and nuances in natural language far better than its predecessor.
- Unlike ChatGPT, GPT-4 is capable of handling both text and image-based queries. This makes it versatile when compared to other AI language models. Such multi-modal advances give GPT-4 scale to get closer to artificial general intelligence (AGI). That means machine intelligence could be as good as human intelligence.
- A gradual transition gives people, policymakers, and institutions time to understand what's happening, personally experience the benefits and downsides of these systems, adapt our economy, and to put regulation in place.

What is the view of AI experts?

- AI experts who have signed FLI's letter approach the rise of LLM-based bots from different vantage points.
- Some see these developments as accelerating humanity towards a doomsday scenario where

machines will triumph over humans. Others see these advances as mediocre intelligence that are potentially unreliable.

THE BHARAT 6G VISION DOCUMENT



Why in news?

- ⇒ Recently, the Prime Minister unveiled the Bharat 6G Vision Document, a starting point for policymakers and the industry to gear up for the next generation of telecommunication.
- ⇒ This is happening even as over 45,000 villages lack 4G connectivity, and 5G networks are still being built out.

Why did the government put out a 6G vision document?

- ⇒ The government has indicated that it wants to accelerate India's wireless data consumption and assume leadership in setting the standards for 6G in the coming years. This may involve everything from encouraging local manufacturing of telecom gear to supporting Indian companies and engineers in international discussions around standardisation.
- ⇒ Another key motivation is the delay in previous generations of telecommunication technology rolling out in India; 5G started rolling out in India years after countries like South Korea and the U.S. had already blanketed their major urban areas with high-speed wireless connectivity. India does not want a repeat of that.
- ⇒ The frequencies generally increase in newer generations of networks, but the lower the frequency, the longer a cell signal can travel. With increasing data usage, lower frequencies in 4G networks may not physically be able to keep up with the demand for traffic.

Goals:

- ⇒ Beyond encouraging greater participation in standardisation discussions, the vision document says the government will financially support "research pathways" where breakthroughs are most likely to advance connectivity goals, leveraging talent in academia and companies. The government said an "apex body" will be set up to shepherd these groups through roadblocks.

- ⇒ Some indicative goals are to
 - a) guarantee every citizen a minimum bandwidth of 100Mbps;
 - b) ensure every gram panchayat has half a terabit per second of connectivity; and
 - c) blanket the country with over 50 million internet hotspots, with thirteen per square kilometre.

How will 6G be different from 5G?

- ⇒ For consumers, websites will load faster, videos will look better, and files will download faster, as has been the case with every new generation of technology.
- ⇒ Latency, which is the time taken for a data packet to move from one place to another (as opposed to speed, which is the number of such packets that can travel on a connection each second), is not far off from the speed of light itself on existing networks.

Satellite Internet:

- ⇒ According to the vision document, satellite constellations will join telecom towers and base stations, integrating networks and extending them to rural areas.
- ⇒ Some of the innovations that the government envisions as 6G-powered connectivity boosters are solutions that already exist in other forms.
- ⇒ For instance, satellite internet in remote areas is a solution that the government can instantly approve by granting firms like Elon Musk's SpaceX and Bharti Airtel-backed OneWeb the administrative clearance to begin offering their services.
- ⇒ Like DTH satellite dishes, setup is minimal as the satellites are already in the sky. However, administrative clearances lag behind.
- ⇒ At least two parts of India have already relied on satellite internet for decades. The Andaman & Nicobar Islands relied on 1Gbps link to connect to the outside world, which is comparable to a single expensive home connection in many Indian cities today. The situation improved vastly after the islands were connected to Chennai by an undersea cable in 2020.

ON TWITTER'S OPEN-SOURCE PROMISE



Context:

- ⇒ Elon Musk has partly delivered on his promise of making Twitter's algorithm open source.

- On April 1, the micro-blogging site's recommendation code was made public. Developers can now modify and make improvements to the code.

What does Twitter's algorithm do?

- At the heart of Twitter's business model is the recommendation algorithm. It is a set of rules that enables the platform to deliver content based on users' interests and preferences. It is with the help of this system that advertisers promote their brands.
- Content flows into a user's timeline through two channels. One pipeline channels content posted by people that the user follows and the other is filled with posts flowing from accounts that could potentially interest the user.
- The latter timeline, called 'For You', acts as a predictive tool to suggest feeds that a user may be interested in. It helps Twitter find answers to questions like, what is the probability a user will engage with another user in the future, what communities on Twitter might a user be interested in and what tweets are trending within them.

How does the algorithm work?

- Twitter's recommendation algorithm runs on a three-step process.
- First, it fetches tweets from multiple recommendation sources. The platform calls this process 'candidate sourcing'.
- After sourcing these tweets, a machine learning model ranks them. After ranking, tweets are filtered to remove those that a user may have blocked, or has already seen.
- At the sourcing stage, the algorithm mixes tweets that eventually flow into a user's 'For You' timeline.
- To mix, it picks 'candidates' from people a user follows, and from those they do not. It calls these two sources as 'in-network' and 'out-network', and together they make up 50/50 of the mix.
- Twitter says that for each request it attempts to extract the top 1,500 tweets from a pool of hundreds of millions. The in-network part is quite easy to build as information is picked in real-time from people a user follows. But out-network sourcing is trickier as the platform must pick content from candidates the user does not follow.
- To do this, Twitter uses what it calls social graph and embedded spaces. The former creates a stream of candidates based on what content followers of a user engage with. And the latter matches the profile of a user with a cluster that exhibits similar interests and preferences as the user.
- Once this is done, using a 48M parameter neural network that is continuously trained on tweet engagement, the platform starts ranking feeds.

What has been the reaction?

- After Twitter open sourced its recommendation algorithm, many people flocked to GitHub to view

the code. Some see this reveal as "a step in the right direction for the future of humanity."

- Others note that the code does not reveal much about how it is used by the platform. They also highlight that important bits of information have been left out.
- For instance, the absence of information on the data it uses to build these pipelines prevents one from having a complete picture of the platform's recommendation system.

GOVERNMENT NOTIFIES AMENDMENTS TO THE INFORMATION TECHNOLOGY (INTERMEDIARY GUIDELINES AND DIGITAL MEDIA ETHICS CODE) RULES, 2021



Why in news?

- Recently, the Ministry of Electronics and IT, Government of India notified amendments to the Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021, related to online gaming and spread of false and misleading information regarding government business.
- The aim of these amendments is to enforce greater due diligence by online gaming and social media intermediaries in respect of online games & fake or false misleading information related to Government business.

Background:

- These amendments have been drafted after holding widespread consultations with multiple stakeholders including parents, school teachers, academics, students, gamers and gaming industry associations, child rights bodies, etc.
- The Ministry of Electronics and IT (MeitY) was allocated the matter related to online gaming rules on December 23, 2022 under the Government of India (Allocation of Business Rules), 1961.

Key Highlights:

Verified publishing:

- As per the amended rules, it has been made obligatory on the part of intermediaries to make reasonable effort to not host, publish or share any online game that can cause the user harm, or that has not been

verified as a permissible online game by an online gaming self-regulatory body/bodies designated by the Central Government.

- The intermediary will also have to ensure that no advertisement or surrogate advertisement or promotion of an online game that is not a permissible online game, is hosted on its platform.

Authority of self-regulatory body:

- The self-regulatory body will have the authority to inquire and satisfy itself that the online game does not involve wagering on any outcome, that the online gaming intermediary and the game complies with the rules, the requirements under law for being competent to enter into a contract (currently at 18 years), and a framework made by the self-regulatory body regarding safeguards against user harm, including psychological harm, measures to safeguard through parental controls, age-rating mechanism, and measures to safeguard users against the risk of gaming addiction.

Online games involving real money:

- The amended rules also cast additional obligations on online gaming intermediaries in relation to online games involving real money.
- These include the displaying of a mark of verification by the self-regulatory body on such games; informing their users of the policy for withdrawal or refund of deposit, manner of determination and distribution of winnings, fees and other charges payable; obtaining the KYC details of the users; and not giving credit or enabling financing by third parties to the users.
- If in case the Central Government issues a notification in the interest of users or other specified grounds, the same rules and obligations will be made applicable to even those games where the user is not required to make any deposit for winnings.

Multiple self-regulatory bodies:

- The Government may notify multiple self-regulatory bodies, which shall be representative of online gaming industry but it will function at arm's length from their members.
- It may notify a Board consisting of Directors who are free from conflict of interest and represent all relevant stakeholders and experts, including online games users, educationists, psychology or mental health experts, ICT experts, persons with child rights protection experience and individuals having experience in relevant fields of public policy and administration.
- The rules provide for the obligations to become applicable once sufficient number of self-regulatory bodies have been designated, so that the online gaming industry has adequate time to comply with its obligations.

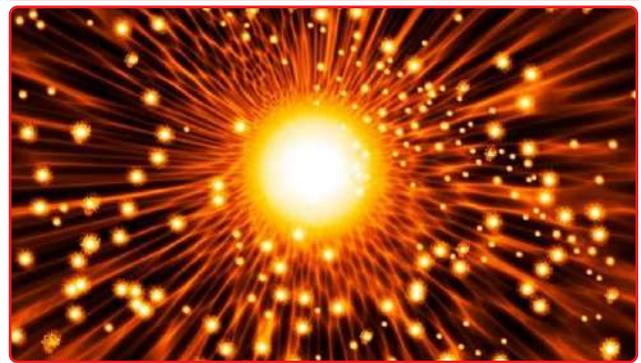
Fact Check Unit:

- The amended rules now also make it obligatory on the intermediaries to not to publish, share or host fake, false or misleading information in respect of any business of the Central Government.
- These fake, false or misleading information will be identified by the notified Fact Check Unit of the Central Government.
- It is to be noted that the existing IT rules already required the intermediaries to make reasonable efforts to not host, publish or share any information which is patently false and untrue or misleading in nature.

Obligation:

- The rules already cast an obligation on intermediaries to make reasonable efforts to not host, publish or share any information which is patently false and untrue or misleading in nature.

INDIA TO SOON GET LIGO TO CATCH GRAVITATIONAL WAVES



Why in news?

- Recently, the Centre has cleared the way for the construction of the Laser Interferometer Gravitational-Wave Observatory (LIGO) in the country. The facility will be built at an estimated cost of Rs 2,600 crore by the year 2030.
- The facility will observe the gravitational waves traveling in the vastness of space from some of the most violent and energetic processes in the Universe and hitting Earth.

What are Gravitational Waves?

- LIGO is a physics experiment that derives its roots in the theories of Albert Einstein, who said that when two massive objects collide they create a ripple in space and time in such a way that 'waves of undulating space-time would propagate in all directions away from the source'.
- These cosmic ripples known as gravitational waves travel at the speed of light, carrying with them information about their origins, as well as clues to the nature of gravity itself.

- ⇒ The strongest gravitational waves are produced by cataclysmic events such as colliding black holes, stars exploding at the end of their lifetimes, and colliding neutron stars.

What Is LIGO?

- ⇒ The Laser Interferometer Gravitational-wave Observatory (LIGO) is the world's most powerful observatory that exploits the physical properties of light and of space itself to detect and understand the origins of gravitational waves.
- ⇒ At the moment there are two such observatories that are separated by a distance of 3000 kilometers that work in tandem to pick up these gravitational waves.
- ⇒ Gravitational wave interferometers rely on the world's most stable high-power lasers, the most precisely figured mirrors, ultraquiet vibration isolation systems, and sophisticated hierarchical feedback systems to pick up these waves emanating from the furthest reaches of the universe.
- ⇒ Each LIGO detector consists of two arms, each 4 kilometers long, comprising 1.2-meter-wide steel vacuum tubes arranged in an 'L' shape, and covered by a 10-foot wide, 12-foot tall concrete shelter that protects the tubes from the environment.

LIGO in India:

- ⇒ LIGO-India will be an advanced gravitational-wave observatory to be located in India as part of a worldwide network. It is envisaged as a collaborative project between a consortium of Indian research institutions and the LIGO Laboratory in the USA, along with its international partners.
- ⇒ LIGO-India received the government's in-principle approval in February 2016. Since then, the project reached several milestones toward selecting and acquiring a site and building the observatory.
- ⇒ The United States will provide key components for the lab worth USD 80 million, which amounts to Rs 560 crore.
- ⇒ The LIGO-India project will be built by the Department of Atomic Energy and the Department of Science and Technology, with a memorandum of understanding (MoU) with the National Science Foundation, the US, along with several national and international research and academic institutions.

Way Forward:

- ⇒ The information gathered by LIGO India could be used in the field of gravitation, relativity, astrophysics, cosmology, particle physics, and nuclear physics

WORLD HEALTH DAY: HOW AI IS TRANSFORMING DIAGNOSTICS, TREATMENT PLANNING, DISEASE PREDICTION

Context:

- ⇒ The healthcare industry is experiencing massive transformation, and one of the primary drivers of this

change is the increasing use of Artificial Intelligence (AI) and Machine Learning (ML) technologies.

- ⇒ In particular, AI and ML are having a significant impact on diagnostics, treatment planning, and disease prediction.



Faster Diagnostics:

- ⇒ One area where AI and ML are making a significant impact is in diagnostics. Medical images, such as X-rays, CT scans, and MRIs, are being analyzed with the help of deep learning algorithms. These algorithms can identify patterns in the images that may be too complex for the human eye to detect, leading to faster and more accurate diagnoses.
- ⇒ AI-powered diagnostic tools are being used to detect breast cancer. By analyzing mammograms, machines can identify early signs of breast cancer.
- ⇒ This technology has the potential to save lives by detecting breast cancer in its early stages when it is more treatable.

Enhanced treatment Planning:

- ⇒ AI and ML are put to use in creating more personalised treatment plans for patients. By analyzing large datasets, machines can identify patterns and predict how a patient may respond to a particular treatment. This information can then be used to create a tailored treatment plan that is more likely to be effective.
- ⇒ AI-powered tools are being used to create personalised cancer treatment plans. By analyzing a patient's genetic makeup, medical history, and other factors, machines can identify the most effective treatment options for that patient.
- ⇒ This approach has the potential to improve patient outcomes and reduce the side effects of treatment.

Quick Disease Prediction

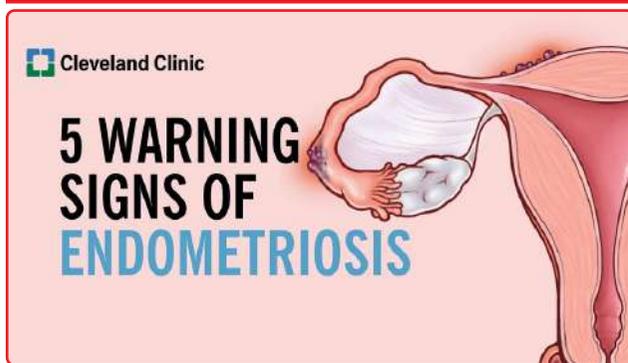
- ⇒ Another area where AI and ML are making a significant impact is disease prediction. By analyzing large datasets, machines can identify risk factors and predict which patients are most likely to develop a particular disease. This information can be used to develop preventive measures or early interventions.
- ⇒ For example, AI-powered tools are being used to predict the likelihood of a patient developing Alzheimer's disease.

⇒ By analyzing brain scans and other medical data, machines can identify patterns that indicate a higher risk of developing Alzheimer's disease. This information can be used to develop preventive measures, such as lifestyle changes or early intervention with medication.

World Health Day:

- ⇒ World Health Day is celebrated on April 7 every year to raise awareness about the importance of health. The day also marks the founding of the World Health Organization (WHO) in 1948.
- ⇒ World Health Day 2023 will focus on the theme, 'Health for All,' marking the 75th anniversary of the World Health Organization (WHO).

WHY A NON-INVASIVE TEST FOR ENDOMETRIOSIS IS TAKING SUCH A LONG TIME



Why in news?

- ⇒ Recently, a U.S.-based company named DotLab has announced a blood test to reliably diagnose endometriosis.
- ⇒ The significance of this technology is highlighted by the fact that people have to wait for 6.7 years on average for a diagnosis, even as the number of people with endometriosis could be much higher than the estimated 190 million worldwide (about 42 million in India alone), due to the number of cases that go undiagnosed.

Why is endometriosis hard to diagnose?

- ⇒ Endometriosis is a painful chronic disease in which tissue similar to the lining of the uterus, or endometrium, grows outside of it.
- ⇒ Doctors often struggle to diagnose endometriosis because of its variety of symptoms, including pain during menstruation, urination, sexual intercourse, bowel movements, fatigue, and sometimes infertility.
- ⇒ There are also no reliable non-invasive diagnostic tools. Laparoscopic surgery is required for a definitive diagnosis.

New test by DotLab:

- ⇒ The blood test is the first of its kind: a non-invasive method to accurately diagnose endometriosis.

- ⇒ This test relies on detecting microRNA, which are small, non-coding RNA segments that regulate gene expression. Many studies have identified microRNAs that are expressed differently in people with endometriosis.
- ⇒ So, researchers can use these unique expression patterns as a sign of the disease. Currently, researchers are exploring the use of microRNA from saliva and blood as diagnostic biomarkers.
- ⇒ The blood test by DotLab is the product of a study in which researchers identified blood-based microRNAs that were expressed differently in people with endometriosis, relative to a group of people who didn't have the disease.
- ⇒ The researchers then created an algorithm combining the expression values of these microRNAs to predict the presence or absence of endometriosis.
- ⇒ They validated it with a different group of people and found that it was able to accurately identify those who did have endometriosis.

Is the new test available to use?

- ⇒ The microRNA screen is at testing level only". Indeed, DotLab is actively recruiting people to participate in ongoing clinical trials expected to be completed by September 2024. The U.S. Food and Drug Administration hasn't yet approved the test.
- ⇒ The researchers also noted that while the test was able to accurately identify both mild and advanced endometriosis, it wasn't able to differentiate between the stage and the severity of the disease.
- ⇒ The importance of the test's sensitivity and specificity, found to be 83% and 96%, respectively.
- ⇒ Sensitivity refers to the test's ability to correctly identify the disease based on microRNA expression levels, i.e. its ability to identify true-positive results.
- ⇒ Specificity is a measure of the test's ability to reliably say that some abnormal microRNA expression is the result of endometriosis, and not some other condition. It's the test's ability to avoid false-positive results.

What do we know about endometriosis?

- ⇒ Endometriosis was first characterised in 1860 but its first biomarkers were found only 150 years later.
- ⇒ Most of them were related to inflammation, which is not specific to endometriosis because it's observed in many diseases. Even when a marker was found, the results were inconsistent.
- ⇒ Endometriosis research is severely underfunded worldwide. A May 2022 report by the U.S. National Institutes of Health stated that endometriosis research accounted for only 0.05% of the institutes' total research budget.
- ⇒ Better funding is one component of designing effective and accessible diagnostic tools.

What are the benefits of a test for endometriosis?

- ⇒ Further, if the test is successful, it could have clinical implications that include reduced time to diagnosis,

disease progress, fewer years of discomfort, and lower surgical risk.

- ⇒ In addition to these clinical implications, understanding which microRNAs are abnormal in endometriosis could also help researchers identify which genes, and thus which pathways, are involved in the disease, which in turn could help unravel its complex biology and offer potential targets for therapy.

VERTEBRATES RECEIVED GENES FOR VISION FROM BACTERIA, FINDS STUDY



Why in news?

- ⇒ A key gene involved in vertebrate vision has been traced back to bacteria, according to a new study.
- ⇒ Some 500 million years ago, the bacteria likely transferred the gene to the ancestor of all vertebrates.

IBRP:

- ⇒ The gene with links to bacteria contained instructions to make the interphotoreceptor retinoid-binding protein (IBRP).
- ⇒ Its protein sequence is most similar to a bacterial protein called peptidases, which are known to break down proteins and recycle them.
- ⇒ IBRP has a key role in vision. In humans, mutated versions of the gene lead to various retinal diseases, such as retinitis pigmentosa (an eye disorder that causes loss of sight) and retinal dystrophy (a degenerative disorder that causes colour blindness or night blindness and complete blindness in progressive conditions).

Background:

- ⇒ Scientists did not have a complete picture of how vertebrate vision evolved. This is because advances in eye arrangements occurred in animals that lived about 500 million years ago.
- ⇒ Consequently, these animals were either not preserved or were not represented in the fossil record.
- ⇒ Further, animals possessing intermediate eye features likely perished due to competition with their counterparts having better visual features.
- ⇒ Researchers from the University of California, San Diego, tried to connect the missing dots by reconstructing the origin of IBRP.

Basics of research:

- ⇒ They performed a phylogenetic reconstruction, which describes evolutionary relationships in terms of the relative recency of common ancestry.
- ⇒ They found “unequivocal evidence” that a vertebrate ancestor acquired the bacterial gene. It duplicated itself twice. Further mutations in the gene resulted in IBRP with a new function.
- ⇒ The transfer likely occurred due to interdomain horizontal gene transfer, which describes the movement of genetic information between organisms.
- ⇒ The analysis identified two additional independent instances of the transfer of bacterial peptidase genes into eukaryotes, once into fungi and once into amphioxus species, key marine animals in understanding the origin of vertebrates.
- ⇒ The researchers, however, could not identify the bacteria that transferred its gene to vertebrates.

Significance:

- ⇒ It reveals further evidence that bacterial genes provide a rich source of evolutionary novelty, not just to other bacterial species, but to eukaryotes (animals, plants, fungi, and many unicellular organisms) as well.

EUROPE'S JUICE MISSION



Why in news?

- ⇒ The European Space Agency has fully integrated Ariane 5 for flight carrying its Juice mission beyond Earth.
- ⇒ The Jupiter Icy Moons Explorer (JUICE) mission will launch to the biggest planet in the solar system in search of signs of life on its three biggest moons.

Details:

- ⇒ The Juice will launch from Europe's spaceport French Guiana on an eight-year-long voyage to Jupiter and its moons.
- ⇒ During its voyage, the spacecraft will complete flybys of Venus, Earth, and the Earth-Moon system to arrive at its destination in 2031.

Mission:

- ⇒ The spacecraft will observe Jupiter and its three largest moons: Callisto, Europa, and, in particular, Ganymede.

- The moon's buried oceans could tell whether life can arise in different environments across the cosmos.
- The objective is to explore the moons for habitability and to explore if it is possible to live around giants.
- The spacecraft will characterise the oceans, icy shells, compositions, surfaces, environments, and activity of Ganymede, Europa, and Callisto and the wider Jupiter system, characterising Jupiter's atmosphere, magnetic environment, ring system, and other satellites.
- After its first arrival in the Jovian system, the spacecraft will go on to spend many months orbiting Jupiter, completing fly-bys of Europa, Ganymede, and Callisto, and finally conducting an orbital tour of Ganymede.

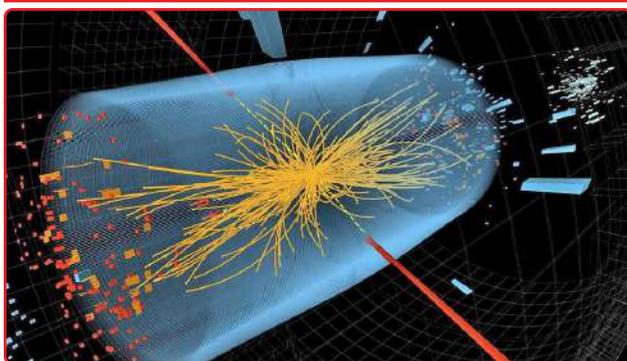
Instruments onboard:

- The spacecraft will be powered by 10 solar panels that will be deployed as two distinctive cross-shaped arrays. These total an area of about 85 square meters.
- Juice has been equipped with 0 state-of-the-art instruments, comprising the most powerful remote sensing, geophysical, and in situ payload complement ever flown to the outer Solar System.
- The mission has a remote sensing package that includes imaging and spectral imaging capabilities, a geophysical package that comprises a laser altimeter (GALA), and a radar sounder (RIME) for exploring the moon's surface and subsurface.
- The in situ package contains a powerful suite of instruments to study the particle environment (PEP), a magnetometer (J-MAG), and a radio and plasma wave instrument (RPWI).
- Juice has a 2.5-meter-long High Gain Antenna to talk to Earth.

Way Forward:

- As the mission begins its journey from French Guiana it will shed more light on what are Jupiter's ocean worlds like and why is Ganymede so unique? and could there be or ever have been life in the Jupiter system?

A BEGINNER'S GUIDE TO THE LARGE HADRON COLLIDER, ITS FUNCTIONS AND ITS FUTURE



Why in news?

- Currently, the engineers are warming up the Large Hadron Collider (LHC), for its third season of operations beginning in May 2023.

Details:

- The Large Hadron Collider (LHC), built by the European Organization for Nuclear Research (CERN), is on the energy frontier of physics research, conducting experiments with highly energised subatomic particles.
- The LHC, is the world's largest science experiment.
- It is a collider that accelerates two beams of particles in opposite directions and smashes them head on. These particles are hadrons.

The functioning of the LHC:

- A hadron is a subatomic particle made up of smaller particles. The LHC typically uses protons, which are made up of quarks and gluons.
- It energises the protons by accelerating them through a narrow circular pipe that is 27 km long.

How it works?

- Simply put, this pipe encircles two D-shaped magnetic fields, created by almost 9,600 magnets. Say there is a proton at the 3 o'clock position.
- It is made to move from there to the 9 o'clock position by turning on one hemisphere of magnets and turning off the other, such that the magnetic field acting on the proton causes it to move clockwise.
- Once it reaches the 9 o'clock position, the magnetic polarity is reversed by turning off the first hemisphere and turning on the second. This causes the proton to move in an anticlockwise direction, from 9 o'clock back to the 3 o'clock position.
- This way, by switching the direction of the magnetic field more and more rapidly, protons can be accelerated through the beam pipe. There are also other components to help them along and to focus the particles and keep them from hitting the pipe's walls.
- Eventually, the protons move at 99.999999% of the speed of light. In the process they accrue a tremendous amount of energy according to the special theory of relativity.

The effects of collision:

- When two antiparallel beams of energised particles collide head on, the energy at the point of collision is equal to the sum of the energy carried by the two beams.
- Thus far, the highest centre-of-mass collision energy the LHC has achieved is 13.6 TeV (teraelectron-volts). This is less energy than what would be produced on clapping hands once.
- The feat is that the energy is packed into a volume of space the size of a proton, which makes the energy density very high.

Particle interactions:

- There is a lot of energy available, and parts of it coalesce into different subatomic particles under the guidance of the fundamental forces of nature.
- Which particle takes shape depends on the amount and flavour of energy available and which other particles are being created or destroyed around it. Some particles are created very rarely.
- If, say, a particle is created with a probability of 0.00001%, there will need to be at least 10 million collisions to observe it.
- Some particles are quite massive and need a lot of the right kind of energy to be created (this was one of the challenges of discovering the Higgs boson).
- Some particles are extremely short-lived, and the detectors studying them need to record them in a similar timeframe or be alert to proxy effects.
- The LHC's various components are built such that scientists can tweak all these parameters to study different particle interactions.

Key findings of the LHC:

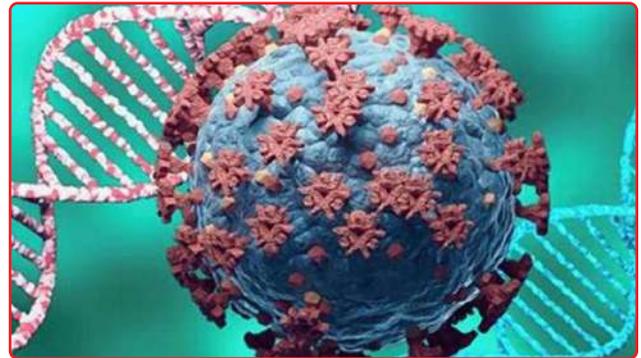
- The LHC consists of nine detectors. Located over different points on the beam pipe, they study particle interactions in different ways.
- Every year, the detectors generate 30,000 TB of data worth storing, and even more overall. Physicists pore through this data with the help of computers to identify and analyse specific patterns. This is how the ATLAS and CMS detectors helped discover the Higgs boson in 2012 and confirmed their findings in 2013.
- The LHC specialises in accelerating a beam of hadronic particles to certain specifications and delivering it. Scientists can choose to do different things with the beam. For example, they have used the LHC to energise and collide lead ions with each other and protons with lead ions.
- Using the data from all these collisions, they have tested the predictions of the Standard Model of particle physics, the reigning theory of subatomic particles; observed exotic particles like pentaquarks and tetraquarks and checked if their properties are in line with theoretical expectations; and pieced together information about extreme natural conditions, like those that existed right after the Big Bang.

What lies ahead for the LHC?

- One way forward, which is already in the works, is to improve the LHC's luminosity (a measure of the machine's ability to produce particle interactions of interest) by 10x by 2027 through upgrades.
- Another, more controversial idea is to build a bigger version of the LHC, based on the hypothesis that such a machine will be able to find 'new physics' at even higher energies.
- While both CERN and China have unveiled initial plans of bigger machines, physicists are divided on

whether the billions of dollars they will cost can be used to build less-expensive experiments, including other colliders, with guaranteed instead of speculative results.

OMICRON VARIANTS EVOLVE STRATEGIES TO EVADE T CELL IMMUNITY

**Why in news?**

- A recent study found that the SARS-CoV-2 virus encodes multiple viral factors that modulate major histocompatibility complex class I (MHC I) expression in the host cells.
- The MHC I plays an important role in alerting the immune system to virally infected cells. The MHC I molecules are expressed on the surface of all infected cells.

CD8 T cells:

- Much like many other viruses that have developed strategies to evade T cell-mediated clearance by humans, SARS-CoV-2 virus too has the ability to evade the CD8 T cells.
- While neutralising antibodies are responsible for preventing infection, CD8 T cells play a huge role in reducing the viral load and clearing the infection by detecting and killing infected cells. The CD8 T cells cannot prevent infection.

MHC I molecules:

- One of the common tricks that viruses use to avoid killing is to inhibit MHC I expression and presentation. SARS-CoV-2 is no exception.
- The SARS-CoV-2 virus has evolved multiple strategies to inhibit MHC I expression, which is not seen in the case of the influenza virus. The suppression of MHC I is specifically seen in the infected cells and varies between different viral strains.
- The data showed that MHC I suppression is mediated by a number of viral gene products and affects only the infected cells. Such a mechanism will not lead to generalised immunodeficiency but reflects a specific survival mechanism for SARS-CoV-2.
- Immune evasion from CD8 T cells could allow the virus in infected cells to survive better in the host. The virus could establish a safe niche for prolonged

replication. To eliminate such persistent reservoirs, there is need to employ antivirals or antibody therapy.

Superior capacity of Omicron:

- The ancestral strain first found in Wuhan, China and a few other variants that came up later already had the ability to escape from T cell-mediated immunity by reducing the expression of MHC I.
- The Omicron subvariants (BA.1, BA.2.12.1, XAF, and BA.4) had a “superior capacity” to suppress MHC I levels on the surface of the cells infected by the virus compared with the ancestral strain and other variants.
- Besides being endowed with greater ability to evade neutralising antibodies, the Omicron subvariants are better at evading recognition by the killer T cells.
- Looking for the molecular mechanism of the enhanced MHC I inhibition by Omicron subvariants, they identified common mutations in the E protein (T9I) which are shared among all Omicron subvariants used in the study.
- Mice infected with SARS-CoV-2 (MA10) showed that MHC I elevation was completely shut down in the infected lung epithelial cells unlike the lung epithelial cells infected with influenza virus.

Evasion strategy:

- They demonstrated that the ability to reduce MHC I expression remained unchanged throughout the pre-Omicron variant-of-concern evolution. These findings suggested three important perspectives on the MHC I evasion strategy of SARS-CoV-2.
 - a) First, the virus utilises multiple redundant strategies to suppress MHC-I expression.
 - b) Second, MHC I downregulation may not only impair cytotoxic T lymphocytes (CTL) recognition of infected cells for killing but may also impair priming of T cells.

Way Forward:

- The study provided evidence of inhibition of MHC I upregulation in SARS-CoV-2-infected cells in both in vitro and in vivo settings.
- The cellular mechanisms and consequences of enhanced MHC I inhibition by Omicron variants on infection and disease remain to be determined.

WHY DID TWITTER ALLEGEDLY BLOCK ACCESS TO TWEETS WITH SUBSTACK LINKS?

Why in news?

- Recently, users of the digital newsletter platform Substack reported they could not like or retweet Twitter posts with Substack links.
- Users complained they could not add tweets to their Substack newsletter unless they were added as screenshots. Twitter also stopped returning searches for Substack on the platform.

What is Substack?

- Substack, launched in 2017, is an online publishing platform that lets writers and podcasters publish and share content directly with their target audience. The platform allows content creators to generate income directly from subscribers on their terms.
- For readers and listeners, the platform provides an easy way to access content and support individual creators based on users’ needs and preferences.
- Substack is a younger platform compared to Twitter and, in recent times, has seen a surge in popularity with a million active users in November 2021.

How is Substack connected to Twitter?

- Substack content creators look to social media platforms to create additional engagement with readers and listeners. It also helps them grow their audience base.
- Creators post links on Twitter, Facebook, and other prominent social media for interested users to subscribe to and follow posts regularly.
- These links are used to redirect users to content published on Substack, driving online traffic toward the original content published on the platform.

Why did Twitter block its links?

- Though their business models differ, Twitter has been trying hard to get more subscribers to its own Blue subscription since its launch in November 2022. And the platform is expected to witness a drop in its monthly active user to around 335 million users in 2024.
- This comes at a time when Twitter’s revenue from top advertisers has fallen sharply in recent months following its takeover by Elon Musk. In March 2023, Twitter reportedly witnessed a drop of 40% year-over-year in both revenue and adjusted earnings for December 2022.
- The platform also saw a decline of 71% in advertising during December 2022.
- It seems that Twitter does not want users to migrate to other platforms through links shared via tweets or retweets. It wants to ensure users spend more time on the platform which in turn boosts its position to increase advertising revenue.

What is Substack Notes?

- Substack recently announced launch of its short-form content platform called Notes.
- The company shared that Notes will provide users with a platform to post short-form content while using recommendations to drive discovery across the platform.
- Notes will come with features for users to publish brief posts, and quotes along with reactions, images, and links. Substack says Notes will run on paid subscriptions and not ads, unlike other social media platforms.

- However, its short-form content seems to pit it as a rival to Twitter, a microblogging format, which is also actively looking to increase its paid subscriber count.

Does Twitter allow sharing links?

- While Twitter has not been against sharing links to other platforms, things seem to have changed since Elon Musk took over the company's reins in October 2022.
- In December 2022, Twitter, in a post, said it would no longer allow users to promote their presence on other social media platforms.
- These included Facebook, Instagram, Mastodon, Truth Social, Tribel, Nostr, and Post.
- Twitter also said that while any type of cross-posting was not a violation of the policy, even from prohibited sites, it would allow paid advertisements and promotions for any of the prohibited social media platforms.
- Twitter, after facing backlash, reversed the policy within 48 hours of being implemented with an apology from the CEO. Twitter later deleted the link announcing the policy.

CABINET APPROVES NATIONAL QUANTUM MISSION



Why in news?

- Recently, the Union Cabinet approved the National Quantum Mission (NQM) at a total cost of Rs.6003.65 crore from 2023-24 to 2030-31.

Aim:

- It aims to seed, nurture and scale up scientific and industrial R&D and create a vibrant & innovative ecosystem in Quantum Technology (QT).
- This will accelerate QT led economic growth, nurture the ecosystem in the country and make India one of the leading nations in the development of Quantum Technologies & Applications (QTA).

Target:

- The new mission targets developing intermediate scale quantum computers with 50-1000 physical qubits in 8 years in various platforms like superconducting and photonic technology.
- Satellite based secure quantum communications between ground stations over a range of 2000

kilometres within India, long distance secure quantum communications with other countries, inter-city quantum key distribution over 2000 km as well as multi-node Quantum network with quantum memories are also some of the deliverables of the Mission.

Applications:

- The mission will help develop magnetometers with high sensitivity in atomic systems and Atomic Clocks for precision timing, communications and navigation.
- It will also support design and synthesis of quantum materials such as superconductors, novel semiconductor structures and topological materials for fabrication of quantum devices.
- Single photon sources/detectors, entangled photon sources will also be developed for quantum communications, sensing and metrological applications.

T-Hubs:

- Four Thematic Hubs (T-Hubs) will be set up in top academic and National R&D institutes on the domains:
 - a) Quantum Computing,
 - b) Quantum Communication,
 - c) Quantum Sensing & Metrology and
 - d) Quantum Materials & Devices.
- The hubs which will focus on generation of new knowledge through basic and applied research as well as promote R&D in areas that are mandated to them.

Way Forward:

- NQM can take the technology development ecosystem in the country to a globally competitive level.
- The mission would greatly benefit communication, health, financial and energy sectors as well as drug design, and space applications.
- It will provide a huge boost to National priorities like digital India, Make in India, Skill India and Stand-up India, Start-up India, Self-reliant India and Sustainable Development Goals (SDG).

WHY IS A STAR-PLANET PAIR EMITTING RADIO SIGNALS?



Why in news?

- YZ Ceti b is a rocky, earth-sized exoplanet rotating around a small red dwarf star, YZ Ceti, barely 12 light-years from Earth.
- Astronomers have detected a repeating radio signal from this exoplanet, suggesting the presence of a magnetic field, one of the prerequisites for a habitable planet around it.

How was the discovery made?

- The discovery was made by Jackie Villadsen from Bucknell University, Pennsylvania, and Sebastian Pineda from the University of Colorado, Boulder, using the Karl G. Jansky Very Large Array radio telescope in New Mexico.
- They had to make multiple observations before they could detect the radio signals from the star YZ Ceti, which seemed to match the orbital period of the planet YZ Ceti b.
- From this, they deduced that the signals were a result of the interaction between the planet's magnetic field and the star.

Why does the magnetic field matter?

- Just as energy surges from the sun sometimes disrupt telecommunications on earth and damage orbiting satellites, intense bursts of energy from the YZ Ceti star-exoplanet exchange produce spectacular auroral lights.
- These radio waves, strong enough to be picked up on earth, confirmed the existence of an exoplanetary magnetic field.
- Such signals can only be produced if the exoplanet orbits very close to its parent star and has its own magnetic field to influence the stellar wind and generate the signals.

What does this mean for YZ Ceti b?

- YZ Ceti b has a small orbit. Since the mid-1990s, astronomers have found hundreds of planets orbiting stars similar to the sun.
- To have an atmosphere and sustain water, a planet has to be at a certain distance from its star (in orbits said to be in the star's "Goldilocks zone"), or it will get burnt.
- Earth, for example, would have been a lot more like Venus if it had been just a little closer to the sun or cold like Mars if it had been any farther.
- Astronomers believe nearly 30% of all star systems discovered could potentially have "Goldilocks zones".

How common are such magnetic fields?

- With such overwhelming numbers, it always stood to reason that strong planetary magnetic fields should be common outside the solar system.
- Nevertheless, despite many of the larger exoplanets detected being found to possess magnetic fields, planetary scientists have never been able to identify such fields on smaller, rocky exoplanets, until now.

- If the latest findings are confirmed by further research, they will confirm their method's ability to lead to the "magnetic characterisation of exoplanets".
- This is important because the survival of a planet's atmosphere may well depend on its having, or not having, a strong magnetic field, since the field protects its atmosphere from being eroded by the charged particles from its star.

What happens next?

- Longer-term monitoring of YZ Ceti b is important to confirm these results and further investigate the properties of the radio signals.
- These findings will help astronomers learn more about rocky worlds in the deepest reaches of space running rings around their parent stars.

PSLV ORBITAL EXPERIMENTAL MODULE



Why in news?

- The Indian Space Research Organisation (ISRO) is all set to launch the Polar Satellite Launch Vehicle (PSLV) recently.

Details:

- The PSLV-C55 mission will launch from the Satish Dhawan Space Center in Sriharikota. This will be the 57th flight of PSLV and the 16th mission using the PSLV Core Alone configuration.
- The spacecraft will carry two Singaporean satellites into orbit, and an Orbital Experimental module that will conduct tests in the vacuum of space.

What is POEM?

- Dubbed PSLV Orbital Experimental Module, Poem is the spent fourth stage of the launch vehicle that would be used as an orbital platform to carry out scientific experiments through non-separating payloads.
- PSLV is a four-stage rocket, and while the first three stages are jettisoned into the ocean after they push the mission to desired orbit, the four-stage remains in orbit and becomes space junk.
- ISRO is now repurposing this fourth stage to use an experimental platform.
- The mission will carry seven non-separable payloads from ISRO, Bellatrix, Dhruva Space, and the Indian Institute of Astrophysics neatly packed on this fourth stage.

How does POEM work?

- The fourth stage or the orbital experimental platform, Poem, is powered by solar panels and is fitted with its own Navigation Guidance and Control (NGC) system, which helps in attitude stabilization.
- The payloads will be switched on, once the primary and the secondary satellites from Singapore are deployed in their orbits.
- The solar panels mounted around the PS4 tank will be deployed after confirmation of the stage achieving stabilization.
- The power will be provided to payloads and avionic packages based on their requirements.

Payloads:

- The payloads include PSLV In orbital Obc and Thermals (PiLOT), an OBC package and an Advanced Retarding Potential analyser for Ionospheric Studies (ARIS-2) experiment from IIST, HET-based ARKA200 Electric Propulsion System from Bellatrix, DSOD-3U and DSOD-6U deployer units along with DSOL-Transceiver in S- & X- bands from Dhruva Space; and Starberry Sense Payload from Indian Institute of Astrophysics (IAP).
- The Starberry has been developed to accurately identify and measure star positions in space.

STRAY DOG POPULATION CONTROL IS DOGGED BY BAD SCIENCE

Context:

- Children, usually from poor families or in rural areas, are being hunted and killed by homeless dogs. State and central governments seem to be helpless to ensure the safety of people on the streets, from what has clearly become a human rights issue and a public health crisis.
- The main culprit behind this is the Animal Birth Control (ABC) Rules that were first introduced in 2001 by the Ministry of Culture, and now replaced by even more absurd ABC Rules, 2023.
- The policy aims to implement a technique called 'catch-neuter-vaccinate-release' to control populations of free-ranging dogs and cats.

Challenges:

- However, despite 20 years of this policy and hundreds of crores of rupees being spent, dog population in India is now more than 65 million. It is unimplementable from a scientific, logistic and economic perspective.
- The ABC programme does not seem to have any benchmarks or targets.
- Both field and modelling studies show that nearly 90% of the dog population needs to be sterilised over a short period of time to achieve a sustained population reduction over a 10-15-year period.
- This 'minor' detail is conveniently skipped by most proponents of the ABC programme.

Feeding dogs:

- The other major problem is that the ABC Rules, 2023, bizarrely require people to feed dogs, wherever they may be. Most people either throw a few biscuits on the roadside or leave leftover food outside their houses, but some people, with almost religious fervour, go out of their way to feed dozens of dogs.
- Reckless feeding tends to congregate dogs and leads to pack formation, territoriality and aggression even amongst sterilised dogs. This behaviour is usually triggered at night.
- At its very worst, this frenzied hunting behaviour can end up causing severe injury or even death due to mauling, especially of small children and the elderly.
- Another study also found that in urban areas, dogs were the second leading cause of road accidents.

Negative aspects:

- It is cruel to dogs, since homeless life on the streets is not easy, with accidents, disease, wanton cruelty and constant fear being their normal state.
- It is cruel to ordinary citizens, depriving people of their right to life, free movement, and a safe environment.
- In many areas, dogs are also leading causes of harm to wildlife, and cause immense loss of biodiversity.
- The unkindest cut of all is that the ABC Rules ban the euthanasia of rabid animals, making India the only country in the world to follow such a cruel practice.

Recommendations:

- Solving this problem requires a multi-pronged approach, and some difficult decisions.
- Strict pet ownership laws, a ban on irresponsible feeding in public places, and encouraging adoption and long-term sheltering of homeless dogs will result in win-win solutions.
- Unlike the ABC programme, the expenses incurred in setting up shelters will at least result in removing dogs from streets permanently, whereas the ABC Rules require that the dogs be released back into the same area, where they can be a nuisance in perpetuity.
- The same people who feed dogs on the streets can supervise shelters to ensure that they are well maintained and also feed them there.

MICROBES AT THE TOP OF THE WORLD



Context:

- An article, Genetic analysis of the frozen microbiome at 7,900 metres above sea level on the South Col of Sagarmatha (Mount Everest), examines the human microbiota on the inhospitable slopes of Mount Everest.
- They were able to collect microbial communities in sediment samples left by human climbers on the South Col of Mount Everest, 7,900 metres above sea level (MSL).

Conditions in South Col:

- The South Col is the ridge which separates Mt. Everest from Lhotse, the fourth highest mountain on earth. The two peaks are only three kilometres apart.
- At 7,900 msl, the South Col is rather inhospitable, a heat wave in July 2022 led to a record high temperature of minus 1.4 degree Celsius.
- Barring humans, visible signs of life have been left behind. The last visible residents are seen at 6,700 msl a few species of moss and a jumping spider that feeds on frozen insects carried by the wind.
- At high altitudes, there is low oxygen (7.8% against 20.9% at sea level), strong winds, temperature usually below minus 15 degree Celsius, and high levels of UV radiation. All these make life processes difficult.
- And as there is an interdependence among species of all sizes in all ecosystems, even microbes cannot sustain themselves.

Carriers of microbes:

- Microbes keep arriving, carried by either birds, animals, or winds. Up to about 6,000 msl, dust particles, less than 20 micrometre in diameter, are blown in by the winds.
- Some of this dust originates in the Sahara Desert, which explains why a wide range of microflora are found at these altitudes. Above 7,000 msl, it is mostly winds and humans that act as carriers.
- Using sophisticated methods such as 16S and 18S rRNA sequencing, the microbe hunters were able to identify the bacteria and other microorganisms found on the South Col.
- A cosmopolitan human signature is seen in the microbes collected here. Also found are *modestobacter altitudinis* and the fungus, *naganishia*, which are known to be UV-resistant survivors.

Kangchenjunga peak:

- In 1847, Andrew Waugh, British Surveyor General of India, found a peak in the eastern end of the Himalayas which was higher than the Kangchenjunga, considered as the highest peak in the world at that time.
- His predecessor, Sir George Everest, was interested in high-altitude hills and had deputed Waugh to take charge. In true colonial spirit, Waugh called it the Mount Everest.

- The Indian mathematician and surveyor, Radhanath Sikdar, was an able mathematician. He was the first person to show that Mount Everest (then known as peak XV) was the world's highest peak.
- George Everest had appointed Sikdar to the post of 'Computer' in the Survey of India in 1831.
- In 1852, Sikdar, with the help of a special device, recorded the height of 'Peak 15' at 8,839 metres. However, it was officially announced in March 1856.

Fact:

- Nepal's eminent historian, late Baburam Acharya, gave Mt. Everest, the Nepali name, 'sagarmatha', in the 1960s.

THE EU'S NEW CRYPTO-LEGISLATION**Why in news?**

- Recently, the European Parliament has approved the world's first set of comprehensive rules to bring largely unregulated cryptocurrency markets under the ambit of regulation by government authorities.
- The regulation, called the Markets in Crypto Assets (MiCA), will come into force after formal approval by member states.

Why regulation?

- Having a comprehensive framework like MiCA for 27 countries in Europe not only harmonises the crypto industry but also gives the EU a competitive edge in its growth compared to the U.S. or the U.K. which lack regulatory clarity.
- 2022 saw some of the biggest failures and wipeouts in the crypto industry involving bankruptcies and fraud scandals, be it the collapse of the crypto exchange FTX and its spat with Binance or the failure of Terra LUNA cryptocurrency and its associated stablecoin.
- The liquidity shortage caused by these shocks led other crypto lending platforms to halt customer transfers and withdrawals before filing for bankruptcy.

What kind of assets will MiCA cover?

- The MiCA legislation will apply to 'cryptoassets', which are broadly defined in the text as "a digital representation of a value or a right that uses cryptography for security and is in the form of a coin or a token or any other digital medium which may be transferred and stored electronically, using

distributed ledger technology or similar technology". This definition implies that it will apply not only to traditional cryptocurrencies like Bitcoin and Ethereum but also to newer ones like stablecoins.

- As for the assets that will be out of MiCA's scope, it will not regulate digital assets that would qualify as transferable securities and function like shares or their equivalent and other cryptoassets that already qualify as financial instruments under existing regulation.
- It will also for the most part, exclude nonfungible tokens (NFTs).
- MiCA will also not regulate central bank digital currencies issued by the European Central Bank and digital assets issued by national central banks of EU member countries when acting in their capacity as monetary authorities, along with cryptoassets-related services offered by them.

What are the new rules?

- MiCA will impose compliance on the issuers of cryptoassets, who are defined as the "legal person who offers to the public any type of cryptoassets".
- It will apply to cryptoasset service providers (CASPs) providing one or more of these services, the operation of a trading platform like Coinbase, custody and administration of crypto-assets on behalf of third parties (customers), the exchange of crypto-assets for funds/other crypto-assets, the execution of orders for crypto-assets, the placing of crypto-assets, providing transfer services for crypto -assets to third parties, providing advice on cryptoassets and crypto-portfolio management.
- The regulation prescribes different sets of requirements for CASPs depending on the type of cryptoassets.
- The base regime will require every CASP to get incorporated as a legal entity in the EU. They can get authorised in any one member country and will be allowed to conduct their services across the 27 countries.
- They will then be supervised by regulators like the European Banking Authority and the European Securities and Markets Authority, who will ensure that the companies have the required risk management and corporate governance practices in place.

Regulation:

- Besides authorisation, service providers of stablecoins also have to furnish key information in the form of a white paper mentioning the details of the crypto product and the main participants in the company, the terms of the offer to the public, the type of blockchain verification mechanism they use, the rights attached to the cryptoassets in question, the key risks involved for the investors and a summary to help potential purchasers make an informed decision regarding their investment.

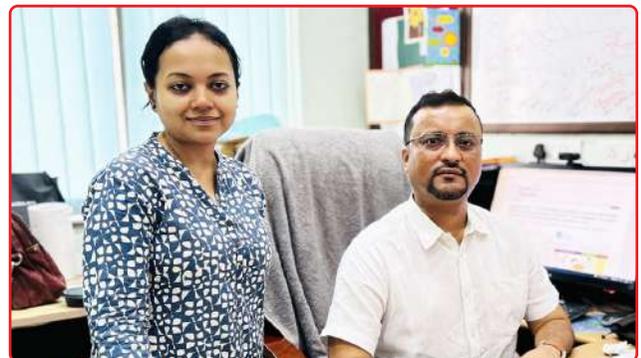
- Another legislation passed with MiCA requires crypto companies to send information of senders and recipients of crypto assets to their local anti-money laundering authority, to prevent laundering and terror financing activities.

How is crypto regulated in India?

- India is yet to have a comprehensive regulatory framework for cryptoassets. A draft legislation on the same is reportedly in the works.
- A full-fledged regulation aside, the Indian government has taken certain steps to bring cryptocurrencies under the ambit of specific authorities and taxation.
- In the Union Budget for 2022, the Finance Ministry said that cryptocurrency trading in India has seen a "phenomenal increase" and imposed a 30% tax on income from the "transfer of any virtual digital asset."
- In March 2023, the government placed all transactions involving virtual digital assets under the purview of the Prevention of Money Laundering Act (PMLA).

HEALTH

IACS'S NOVEL COMPOUND TREATS DRUG-RESISTANT KALA-AZAR INFECTION



Why in news?

- Experimental work undertaken in mice has shown a novel quinoline derivative to be effective in sharply reducing the load of Leishmania donovani in both the spleen and liver of lab-grown mice.
- The highlight of the work carried out by researchers at the Kolkata-based Indian Association for the Cultivation of Science (IACS) is the potential of the quinoline derivatives to treat drug-resistant leishmaniasis, also called kala-azar (black fever).

Potential of quinoline derivative:

- The quinoline derivative is a potent inhibitor of an enzyme called topoisomerase 1 (LdTop1), which is essential for maintenance of DNA architecture in the parasites; this enzyme is distinct from the one found in humans.
- Poisoning of LdTop1 imparts a significant level of cytotoxicity to both the Leishmania parasites found in gut of sandfly vectors (promastigotes) as well as

the form found in the infected humans (amastigotes) of both the wild type and the antimony-resistant isolates without inducing any lethality to human and mice host cells.

Burden of Kala-azar:

- Kala-azar is a vector borne (sandfly) neglected tropical disease caused by the protozoan parasites of the genus leishmania that afflicts the world's poorest populations in over 90 countries.
- Current annual estimates of kala-azar are about 1,00,000, with more than 95% of cases reported to the World Health Organization (WHO) from India and other tropical countries, most importantly co-infection with HIV, which leads to an immunocompromised state.
- The four States endemic for kala-azar in India are: Bihar (33 districts), Jharkhand (4 districts), West Bengal (11 districts), and Uttar Pradesh (six districts).
- The current treatment regimens against kala-azar use formulations that are toxic and induce high levels of drug-resistance.
- Since the enzyme is essential for parasite replication and transcription from DNA to RNA, inhibition of its activity leads to DNA torsional strain, degradation of the DNA, and ultimately parasitic cell death.

Antileishmanial activity:

- The novel inhibitor targeting the leishmania parasites was identified by screening them against recombinant Leishmania topoisomerase 1 enzyme. In all, 21 derivatives were prepared and evaluated for their antileishmanial activity, and one of them was found to be effective.
- The derivative was found to generate persistent and less reversible DNA breaks compared with the camptothecin inhibitor (discovered in 1966) even after the novel inhibitor was removed from the culture medium leading to enhanced parasite killing.

Way Forward:

- It brings new potential for clinical trials of the quinoline derivative in human hosts infected with drug-resistant leishmaniasis in the rural endemic areas without inducing cytotoxic side effects commonly seen with currently available drugs.
- The further studies are required to test if the novel derivative develops resistance to anti-leishmaniasis therapy by generating point mutations. Also, further studies are needed to test the drug-resistance potential prior to undertaking clinical trials on humans.

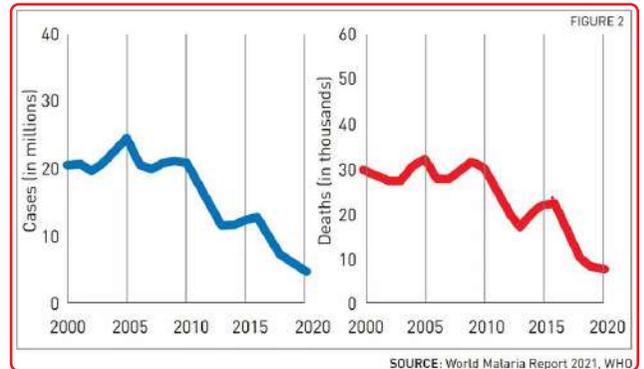
MALARIA SET TO BE NOTIFIABLE DISEASE ACROSS INDIA EVEN AS CASES SHOW A DECLINE

Why in news?

- Malaria is all set to become a notifiable disease across India, with Bihar, Andaman and Nicobar Islands and

Meghalaya too in the process of putting the vector-borne disease in the category.

- This will then require by law that cases be reported to government authorities. Currently, malaria is a notifiable disease in 33 States and Union Territories in India.



Malaria elimination:

- This is part of India's vision to be malaria-free by 2027 and to eliminate the disease by 2030.
- The Health Ministry has also initiated a joint action plan with the Ministry of Tribal Affairs for malaria elimination in tribal areas.

Status in India:

- In India, malaria is not just a public health issue but also a social, economic, and political challenge that requires the cooperation of all stakeholders.
- India was the only high-burden, high-impact country in the Southeast Asia region to report a decline in malaria cases in 2020 as compared to 2019.
- India witnessed 85.1% decline in malaria cases and 83.36% decline in deaths during 2015-2022.

Real time monitoring:

- There is now availability of near-real time data monitoring through an integrated health information platform (HIP-Malaria Portal) and periodic regional review meetings to keep a check on malaria growth across India.
- The countries affected by malaria in this region should accelerate the reach of high-impact tools and strategies to prevent, detect and treat it.

Future roadmap:

- Intensified efforts must be made to reach at-risk and vulnerable populations with currently available strategies and tools. Globally, children in the poorest households are five times more likely to be infected with malaria.
- Malaria is also more prevalent among young children whose mothers have a lower level of education and live in rural areas.
- Reaching these populations with available malaria prevention, diagnosis and treatment is critical for achieving the global technical strategy for malaria 2016-2030 and Sustainable Development Goal targets

and delivering on the promise of zero malaria for everyone, everywhere.

About Malaria:

- Malaria is a mosquito-borne infectious disease that affects humans and other animals.
- It is caused by the bite of the female Anopheles mosquito if the mosquito itself is infected with a malarial parasite.
- There are five kinds of malarial parasites out of which Plasmodium falciparum (parasite is responsible for 70% of cases in India), and Plasmodium vivax (globally, the commonest ones).

ONE IN SIX PEOPLE WORLDWIDE AFFECTED BY INFERTILITY, FINDS WHO

Why in news?

- Recently, the World Health Organization (WHO) report titled, 'Infertility Prevalence Estimates, 1990–2021' was published.
- It reported that at least one in six people worldwide are infertile, advocating for better access to fertility care essential for global health. The rates are "comparable" for high, middle and low-income countries.

What is infertility?

- Infertility, which affects men and women, is a reproductive condition defined by the failure to achieve a pregnancy after 12 months or more of regular unprotected sexual intercourse.

Key Findings:

- About 17.5 per cent of the global adult population is affected, the WHO found after analysing all relevant studies on infertility from 1990-2021 to compile the new in-depth estimates.
- The magnitude of infertility as a global public health issue has been underlined by the report and showed an urgent need to expand access to prevention, diagnosis and treatments.
- Understanding the magnitude of infertility is critical for developing appropriate interventions, for monitoring access to quality fertility care and for mitigating risk factors for and consequences of infertility.

Challenges:

- The prevalence of infertility, diagnosis and treatment such as in vitro fertilisation (IVF) remain underfunded and patients find themselves priced out.
- People in the poorest countries spend a greater proportion of their income on fertility care than those in wealthier countries. Infertility is also linked to "distress and stigma", as well as an increased risk of intimate partner violence.
- Millions of people faced catastrophic healthcare costs after seeking treatment for infertility and all too often, a "medical poverty trap".

Way Forward:

- Fertility care is a core part of sexual and reproductive health and responding to infertility can mitigate gender inequality.

CULTURE

NO IDOLS, NO ARMS: THE PATTANAM MYSTERY



Context:

- In village of Pattanam in central Kerala lies the only multicultural archaeological site on the southwestern coast of the Indian subcontinent.
- Often referred to as the 'first emporium' of the Indian Ocean, Muziris; of which Pattanam is part is an example of the Greco-Roman classical age coming into direct contact with an ancient South Indian civilisation.

Key Findings from excavation so far:

- Excavations so far that have unearthed less than 1% of the site, point to a startling fact: there is no evidence that institutionalised religion existed in ancient Pattanam.
- There was certainly no indication of the graded inequality embodied in the caste system that has characterised contemporary Kerala and most of the rest of India.
- The technological, metallurgical, literary, and artistic advances of this phase bear witness to rigorous cultural and commercial exchanges.

Foreign articles:

- The Pattanam excavations have unearthed over 45 lakh sherds (ceramic fragments); these include approximately 1.4 lakh belonging to the littoral regions of the Mediterranean, the River Nile, the Red Sea, the western and eastern Indian Oceans, and the South China Sea.
- Recent findings include the seal of a sphinx, native to the ancient Greek city of Thebes.

Urban centre:

- This wide span of locations confirms the existence of a thriving urban centre from the 5th century B.C. till the 5th century A.D., with its peak phase from 100 B.C. to A.D. 300.

What are the things that did not emerge from Pattanam?

- Pattanam has not chosen to delight archaeologists with idols of gods and goddesses, or the remains of grandiose places of worship.
- This iron-age and post-iron-age site was also bereft of sophisticated weaponry. This is in sharp contrast with some Pattanam-contemporary sites such as Berenike in Egypt and Khor Rori in Oman.
- Were Pattanam residents a peace-loving people who did not harbour religious and caste boundaries?
- The apparent absence of religious and martial remains can only tell that religion and war did not exist as they are known today. It is safe to say there is no evidence of institutionalised religion or caste.

Death rituals:

- Driven by curiosity and the collaborative support of leading scientific institutions such as the University of Oxford and the Centre for Cellular and Molecular Biology in Hyderabad, Pattanam researchers considered another angle of inquiry.
- Given that death and customs associated with mortality are areas that see the biggest religious and caste divides today, what do the Pattanam remains convey about the death rituals of people of that time? The grave remains at the Pattanam site were confined to fragmentary skeleton remains.
- The burials were of a "secondary" nature, where the dead were cremated first and the osseous remains ceremoniously buried later, taphonomic studies and minimal pathological analysis found.
- Large terracotta urn burials and a wide variety of stone monuments abound in the Periyar delta and basin regions, showing the ceremonious nature of the later burial practices. No artefact found indicates any religious customs.
- The genotype results and ancestry analyses of samples point to South Asian, West Asian, and Mediterranean lineages. Indeed, people of widely differing backgrounds were buried the same way, strongly suggesting the prevalence of a secular ethos.

Sangam era link:

- Researchers focusing on Sangam-era literature, connect this observation with the evidence from Sangam sources to point out that the people of the time were secular in every aspect of their highly sophisticated and pluralistic society.

Lesson for modern age:

- Material evidence from the site strengthens the belief that Pattanam society may have lived in harmony with nature, like several indigenous societies did, and not viewed people as separate from nature. This had the positive fallout of living life in an ecologically responsible manner.
- At the very least, such a society did not sanction the

exploitation of natural resources that is at the heart of most problems faced by the contemporary world.

- Those who aspire to meaningful alternatives of community living, looking beyond a casteless society towards a closer connect with nature, might find answers in the ground beneath, as more of Muziris (Pattanam) is unearthed.

MISSION TO MAP RURAL INDIA'S CULTURAL ASSETS COVERS OVER ONE LAKH VILLAGES



Why in news?

- In a bid to harness the unique cultural heritage of rural India, the government has identified and documented distinctive features of more than one lakh villages across the country.

Key Highlights:

- In this cultural asset mapping, villages have been broadly divided into seven-eight categories based on whether they are important ecologically, developmentally or scholastically, if they produce a famous textile or product, and if they are connected to some historical or mythological events such as the Independence struggle or epics like the Mahabharata.
- Ecological: The ecological category, for example, includes the Bishnoi village near Jodhpur in Rajasthan, which is a case study for living in harmony with nature, and Uttarakhand's Raini village, which is famous for the Chipko movement.
- Developmental: There are also villages that have developmental importance like Modhera in Gujarat, which is the first solar-powered village in India.
- Historical: Suketi in Himachal Pradesh, Asia's oldest fossil park, and Pandrethan in Kashmir, the village of Shaivite mystic Lal Ded, are also classified for their historical importance.

National Mission for Cultural Mapping (NMCM):

- The entire exercise has been carried out under the Mera Gaon Meri Dharohar (My Village My Heritage) programme of the National Mission for Cultural Mapping (NMCM).
- The NMCM aims to develop a comprehensive database of art forms, artists and other resources across the country.

Survey process:

- ⇒ The Indira Gandhi National Centre for Arts (IGNCA) said it has undertaken the cultural asset mapping of these villages through field surveys.
- ⇒ Detailed field surveys were carried out by joint teams of the Culture Ministry and the Common Services Centres (CSC), under the Ministry of Electronics and IT (MEITY) to create the dossiers.
- ⇒ The survey documents the cultural identity of the villages by involving citizens to share what makes their village, Block or district unique.
- ⇒ The survey process involves a CSC Village Level Entrepreneur (VLE) conducting meetings with locals and then uploading interesting facts about their village, its places of interest, customs and traditions, famous personalities, festivals and beliefs, art and culture, etc., on to a special application.

What's next?

- ⇒ The IGNCA plans to cover all the 6.5 lakh villages in the country.

WHAT THE UTTARAMERUR INSCRIPTION, RECENTLY REFERRED TO BY PM MODI

**Why in news?**

- ⇒ Recently, the Prime Minister Narendra referred to the Uttaramerur inscription in Kanchipuram, Tamil Nadu, while discussing India's democratic history.

Details:

- ⇒ While Uttaramerur has multiple inscriptions spanning centuries, the most famous one, being referred to by PM is from the reign of Parantaka I (907-953 AD).
- ⇒ These provide a detailed description about the village's self-governance and have been cited by historians and political leaders alike as evidence of India's history of democratic functioning.

Where is Uttaramerur?

- ⇒ Uttaramerur lies in present-day Kanchipuram district, approximately 90 km southeast of Chennai.
- ⇒ It is known for its historic temples built during Pallava and Chola rule.
- ⇒ The famous inscription from Parantaka I's reign is found on the walls of the Vaikunda Perumal Temple.

What does the inscription say?

- ⇒ The inscription gives details of the functioning of the local sabha, i.e. the village assembly. A sabha was an assembly exclusively of brahmins and had specialised committees tasked with different things.
- ⇒ The Uttaramerur inscription details how members were selected, the required qualifications, their roles and responsibilities, and even the circumstances in which they could be removed.

Appointing representatives to the sabha:**Composition:**

- ⇒ There will be 30 wards. Everyone living in these 30 wards would assemble and select one representative for the village assembly.

Qualifications:

- ⇒ These include ownership of a certain amount of land, having a house, being between the age of 35 and 70 and "knowing mantras and Brahmanas" (from the Vedic corpus).
- ⇒ An exception can be made on land ownership if the person has learnt at least "one Veda and four Bhashyas". One must also be "well-versed in business" and "virtuous".

Disqualification:

- ⇒ The inscription then lists a number of factors which disqualify someone and their family (all the relations are systematically listed) from consideration.
- ⇒ These include, "not having submitted accounts" while previously serving in a committee, committing any of the first four of the five 'great sins' (killing a brahmin, drinking alcohol, theft and adultery), being associated with outcastes, and eating 'forbidden' dishes.

Election:

- ⇒ All those eligible and willing would write their names on palm leaf tickets following which, the representative would be chosen on the basis of an elaborate draw of lots, conducted by priests in the inner hall of the building where the assembly meets.

Committees:

- ⇒ The inscription describes a number of important committees within the sabha with their own distinct functions.
- ⇒ These include, the garden committee, the tank committee, the annual committee (an executive committee which required prior experience and knowledge to be a part of), the committee for supervision of justice (for supervising appointments and wrong doing), the gold committee (in charge of all the gold in the village temple) and the five-fold committee (its role is unclear in the inscription).
- ⇒ These committee assignments would last for 360 days after which the members would have to retire.
- ⇒ Anyone in the committee who was implicated in any wrongdoing, such as forgery or having ridden an

donkey (i.e. being punished for a crime), was removed instantly.

- Also, the inscription emphasises upon the keeping of accounts – any discrepancy can also disqualify members of the sabha.

Is this an example of a democracy?

- While the Uttaramerur inscription gives details of local self-governance, on closer inspection, it is far from a truly democratic system.
- Not only does it restrict sabha membership to a tiny subsection of land-owning brahmins, it also does not have true elections. Rather, it chooses members from the eligible pool of candidates through a draw of lots.
- That being said, this does not mean that this inscription should not be cited as a precedent for democratic functioning. The idea of a democracy, as understood today, is a fairly recent phenomenon.
- The United States, often hailed as the epitome of a liberal democracy, only gave universal adult franchise to its population in 1965.

Conclusion:

- What the Uttaramerur inscription details is a system of local self-government, outside the direct authority of the king. Furthermore, for all intents and purposes, the inscription is like a constitution – it describes both the responsibilities of members of the sabha as well as the limitations to the authority of these members.
- If the rule of law (rather than rule by personal diktat) is an essential component of a democracy, the Uttaramerur inscription describes a system of government which follows just that.

WORLD HERITAGE DAY OR INTERNATIONAL DAY FOR MONUMENTS AND SITES (IDMS)

Why in news?

- World Heritage Day or International Day for Monuments and Sites (IDMS) was being celebrated with the theme 'Heritage Changes'.



About World Heritage Day:

- World Heritage Day is celebrated every year on 18 April to preserve human heritage and to recognize all the efforts of relevant organisations.

- The theme offers the opportunity to respond to questions regarding learning about traditional ways of knowing and knowledge systems in relation to climate action, and how to use a cultural heritage focus to support equitable protection of vulnerable communities through climate action, while responding to the UN Decade of Action.

Background:

- In 1982, the International Council on Monuments and Sites (ICOMOS) announced 18 April as World Heritage Day. This was approved by the General Assembly of UNESCO in 1983, to enhance awareness about the importance of cultural heritage, and monuments and conserving them.

UNESCO's World Heritage Sites:

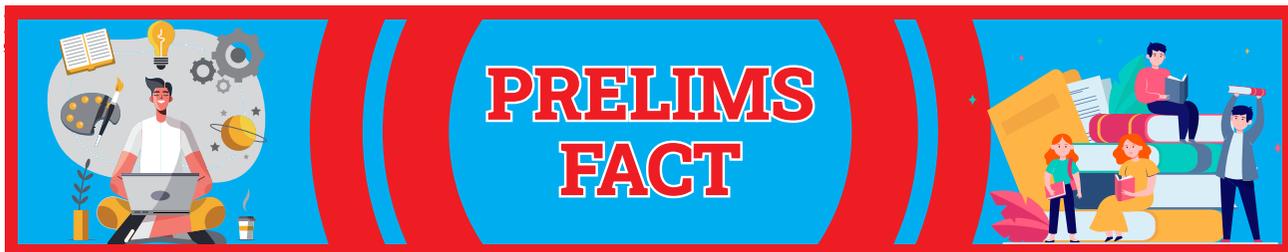
- The United Nations Educational, Scientific and Cultural Organisation (UNESCO) has a total of 1,154 monuments designated as world heritage sites from all over the world.
- Apart from India only Italy, Spain, Germany, China and France have 40 or more World Heritage sites.
- Out of 40 World Heritage Inscriptions, 10 have been done in the last 9 years with a wide range of diversity from across India. India's Tentative List has increased by 37 from 2014 to 2022, from 15 in 2014 to 52 in 2022.

Buddhist heritage:

- The Government of India, has been focussing on preserving the Buddhist heritage and taking the message of Lord Buddha across the world.
- In November 2021, Prime Minister inaugurated the Kushinagar International Airport in Uttar Pradesh to facilitate easy access to the Mahaparinirvana Temple, where Lord Buddha attained nirvana.
- In May 2022, Prime Minister laid the foundation stone for a technologically-advanced India International Centre for Buddhist Culture and Heritage in Lumbini at a cost of 100 crore at the Lord Buddha's birthplace.
- The Ministry of Tourism is developing the Buddhist circuit around Kushinagar Sravasti and Kapilvastu as a part of the SWADESH Darshan scheme.
- Overall, several projects for the development of Buddhist circuits in Uttar Pradesh, Madhya Pradesh, Bihar, Gujarat and Andhra Pradesh are already nearing completion.

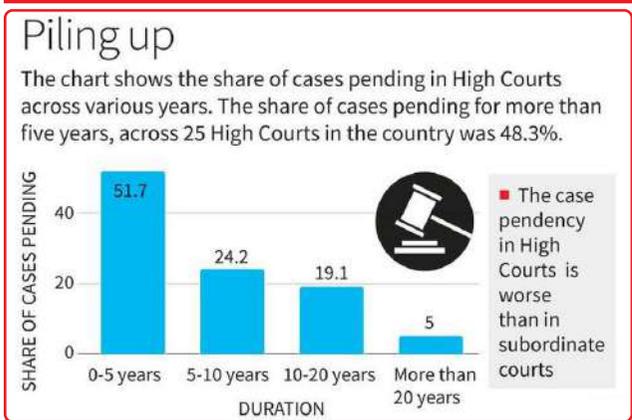
Way Forward:

- The government is also taking a 'Whole of Government' approach to preserve Indian culture and heritage. Several central ministries like the Ministry of Tourism, Ministry of Culture, Ministry of Civil Aviation, Ministry of Tribal Affairs, initiatives like Namami Gange and Swachh Bharat etc all are converging together for holistic outcomes with respect to protecting Indian heritage.



POLITY & GOVERNANCE

VACANCIES OF JUDGES REMAIN HIGH, CASES PILE UP: INDIA JUSTICE REPORT



Why in news?

- ➔ According to the latest, India Justice Report (IJR), 2022, Indian courts are jammed with cases and are seeing pendency increase by the day.
- ➔ At the same time, they are also functioning with fewer judges than the sanctioned number.

Rising pendency:

- ➔ As of December 2022, against a sanctioned strength of 1,108 judges, the High Courts were functioning with only 778 judges. The subordinate courts were found functioning with 19,288 judges against a sanctioned strength of 24,631 judges.
- ➔ Correspondingly, the number of cases pending per judge is rising in most States over the past five years, while the sanctioned strength has remained more or less the same.
- ➔ At High Court level, Uttar Pradesh has the highest average pendency; cases remain pending for an average of 11.34 years, and in West Bengal for 9.9 years. The lowest average High Court pendency is in Tripura (1 year), Sikkim (1.9 years) and Meghalaya (2.1 years).
- ➔ The number of cases a judge has to deal with has steadily increased. Between 2018 and 2022, the caseload per judge increased in 22 States and Union Territories.

CCR:

- ➔ The Case Clearance Rate (CCR), or the number of cases disposed of in a year measured against the

number filed in that year, is a common metric used to determine the rate at which cases are disposed of.

- ➔ A CCR of more than 100% indicates that the number of pending cases is reducing.
- ➔ The report found that the High Courts are clearing more cases annually than the subordinate courts. Between 2018-19 and 2022, the national average improved by six percentage points (88.5% to 94.6%) in High Courts, but declined by 3.6 points in lower courts (93% to 89.4%).
- ➔ At the same period, Tripura is the only State where the CCR in district courts remained above 100%, with the exception of 2020 – the year of the pandemic.
- ➔ The High Courts of Kerala and Odisha have higher case clearance rates; 156% and 131% respectively while the High Courts of Rajasthan (65%) and Bombay (72%) have the lowest case clearance rates.

India Justice Report:

- ➔ The India Justice Report is a collaborative effort undertaken in partnership with DAKSH, Commonwealth Human Rights Initiative, Common Cause, Centre for Social Justice, Vidhi Centre for Legal Policy and TISS-Prayas.

MORE WOMEN JUDGES AT DISTRICTS COURTS THAN IN HIGH COURTS



Why in news?

- ➔ There are more women judges at the district court level than at the High Court level, with 35% of the total

number of judges at the district court level and only 13% of judges in the High Courts across the country being women, the India Justice Report (IJR), 2022 has revealed.

Key Highlights:

- ⇒ While the share of women judges remains uneven across the States, Goa, with 70%, has the highest percentage of women judges at subordinate courts, followed by Meghalaya and Nagaland at 63% each.
- ⇒ The IJR stated that the representation of women judges is steadily rising in subordinate courts, but in the High Courts, the share of women judges remains low.

High Courts:

- ⇒ Among the High Courts, Sikkim, with a total strength of just three judges, has the highest national average at 33.3% of women judges.
- ⇒ Meanwhile, Bihar, Tripura, Manipur, Meghalaya, and Uttarakhand continued to have no women judges in their High Courts.

Reservation:

- ⇒ Though caste-based reservations vary from State to State, at the district court level, no State or Union Territory "could fully meet all its Scheduled Castes, Scheduled Tribes, and Other Backward Classes quotas".
- ⇒ A Department of Justice Report to the Parliamentary Standing Committee on Personnel, Public Grievances, Law and Justice is reported to have stated that "from 2018 to December 2022, a total of 537 judges were appointed to the High Courts, of whom 1.3% were ST, 2.8% SC, 11% were from OBC category and 2.6% were from minority communities".

MHA TO PROVIDE FINANCIAL ASSISTANCE TO PRISON INMATES



Why in news?

- ⇒ The Ministry of Home Affairs (MHA) would provide States with financial support to help underprivileged prisoners who are unable to get bail or secure release from prisons due to financial hardship.

Key Highlights:

- ⇒ In line with one of the announcements of the Union Budget, 'Support for Poor Prisoners', the scheme

envisages "financial support to poor persons who are in prisons and unable to afford the penalty or the bail amount".

- ⇒ The scheme will enable underprivileged prisoners, majority of whom belong to socially disadvantaged or marginalised groups with lower education and income levels, to get out of prison.

Technology-driven solutions:

- ⇒ To further strengthen the process, technology-driven solutions will be put in place to ensure that benefits reach the poor prisoners; reinforcing the e-prisons platform; strengthening of District Legal Services Authority and sensitisation and capacity building of stakeholders to ensure that quality legal aid is made available to needy poor prisoners, etc.

Way Forward:

- ⇒ The prisons are an important part of the criminal justice system, and play a significant role in upholding the rule of law.
- ⇒ According to the Prisons Statistics of India Report, 2021, over 5.54 lakh people were lodged in prison and the total capacity of the jails in India was about 4.25 lakh, an occupancy rate of 130%.

NGT PANEL TO REVISIT CLEARANCE GRANTED FOR GREAT NICOBAR ISLAND PROJECT



Why in news?

- ⇒ The National Green Tribunal has constituted a high-powered committee to re-examine the environmental clearance granted to Andaman and Nicobar Islands Integrated Development Corporation (ANIDCO) for the multi-component mega project in the Great Nicobar Island.
- ⇒ Along with the development of an international container transshipment terminal, the project also involves the development of a military-civil, dual-use airport, a gas, diesel, and solar-based power plant, and a township.

Background:

- ⇒ The NGT was hearing appeals against Forest Clearance (FC) and Environmental Clearance (EC) provided to the project proponent (PP) ANIDCO.

- Earlier it had sought a response from the Union Ministry of Environment, Forest and Climate Change (MoEF&CC) and the PP.

Key Highlights:

- The bench said there was a need for adequate studies on the adverse impact on coral reefs, mangroves, turtle nesting sites, bird nesting sites, other wildlife, of erosion, disaster management and other conservation and mitigation measures.
- Besides, the island coastal regulation zone (ICRZ) notification of 2019 had to be complied with and tribal rights and rehabilitation had to be ensured.
- It underlined some unanswered deficiencies such as a threat to 4,518 coral colonies, impact assessment being of only one season as against the mandated three seasons and a part of the project being in the area where a port was prohibited.
- It asked the MoEF&CC's secretary to appoint a nodal officer. In the light of the report of the committee, the EC or its conditions may be re-looked into by the competent authority.

Development Plan:

- The Indian Ocean has emerged as a key intersection zone of Indian and Chinese strategic interests, the project will help bridge the infrastructural gap on the island and promote international trade saving huge amounts on transshipment cargo.
- Earlier in January, the Ministry of Ports, Shipping and Waterways had said the project is expected to be completed with an investment of Rs 41,000 crore (USD 5 billion), including investment from both government and the PPP concessionaire.
- The proposed port will have the ultimate capacity to handle 16 million containers per year and, in the first phase, will handle above 4 million containers.

What's next?

- Till then, further work in pursuance of impugned EC may not proceed except for the work which may not be of irreversible nature, the tribunal said disposing the appeals.

16TH FINANCE PANEL WILL BE CONSTITUTED IN NOVEMBER

Why in news?

- The Union government is gearing up to constitute the Sixteenth Finance Commission in November 2023.

Mandate:

- It will recommend the formula for sharing revenues between the Centre and the States for the five-year period beginning 2026-27.
- The Finance Commission is also tasked with recommending the distribution ratio of revenues between States, along with other terms of reference that the Centre proposes.

Extension to 15th FC:

- It is to be formed every five years according to Article 280 of the Constitution.
- However, the Fifteenth Finance Commission, which was headed by N.K. Singh, had been given an extended mandate to make recommendations for six years, up till 2025-26.
- The government is bound to consider the Commission's suggestions and submit an action taken report that conveys its stance on those ideas, along with the first Union Budget of the five-year period.
- That will be the Budget of 2026-27, likely to be presented on February 2, 2026, as February 1 falls on a Sunday that year.
- The last time the Constitutional body was given a six-year mandate was for the Ninth Finance Commission formed in June 1987. But the Tenth Finance Commission was still constituted in June 1992 within the five-year deadline specified by the Constitution.

Terms of reference of 15th FC:

- The Fifteenth Finance Commission was handed some contentious tasks, such as determining whether a separate mechanism was warranted for funding defence and internal security spends.
- It was also asked to rely on Census 2011 data for its recommendations, which had caused concern among some States that had done better on health and population management vis-à-vis other peers.

GST Council impact

- Typically, this officer is also appointed the member secretary of the Finance Commission, once it is constituted.
- A fresh challenge for the Sixteenth Commission is that it will have to figure out a way to factor in the impact of decisions taken by another Constitutional body created recently, the Goods and Services Tax (GST) Council.
- While the Finance Commission is not a permanent body, the GST Council is, and the latter's decisions on tax rate and administration changes can impact the former's projections.

SC SETS UP CONSTITUTION BENCH TO HEAR PLEA ON SAME-SEX MARRIAGE

Why in news?

- Recently, the Supreme Court made it clear that it will not go into the personal laws governing marriages while deciding the pleas seeking legal validation for same-sex marriages and asked the lawyers to advance arguments on the Special Marriage Act.
- A five-judge constitution bench headed by Chief Justice D Y Chandrachud termed the issue involving the pleas complex and said the very notion of a man and a woman, as referred to in the Special Marriage Act, is not an absolute based on genitals".



Special Marriage Act:

- The Special Marriage Act, 1954 is a law that provides a legal framework for the marriage of people belonging to different religions or castes. It governs a civil marriage where the state sanctions the marriage rather than the religion.

Centre's response:

- Solicitor General appearing for the Centre, referred to the laws on transgenders and said there are several rights such as the right to choose partners, privacy right, right to choose sexual orientation, and any discrimination is criminally prosecutable.
- However, the conferment of socio-legal status of marriage cannot be done through judicial decisions. It cannot even be done by the legislature. The acceptance has to come from within the society.
- He said the problem will arise when a person, who is a Hindu, wants to avail the right to marry within the same sex while remaining a Hindu. Hindus and Muslims and other communities will be affected and that is why the states should be heard

Distinct views:

- Senior advocate Rakesh Dwivedi supported the Centre's objection to same-sex marriages and said all states were necessary parties in the matter and needed to be heard.
- Senior advocate Kapil Sibal, appearing for Jamiat-Ulama-i-Hind, said the court should either hear the issue in entirety or not hear it at all as a piecemeal approach will cause more harm than good to the group seeking legal validation for same-sex marriages.
- One of the senior lawyers Menaka Guruswamy referred to the difficulties being faced by the LGBTQIA+ (lesbian, gay, bisexual, transgender, queer, questioning, intersex, pansexual, two-spirit, asexual, and ally) community in opening bank accounts and buying life insurance and alleged they were being denied these rights.

Background:

- Earlier during the day, the Centre insisted its preliminary objection on whether the court can at all go into this question or it would be essentially for parliament to go into it be heard first.

- The apex court had on March 13 referred the pleas to a five-judge constitution bench for adjudication, saying it is a very seminal issue.
- The hearing and the outcome will have significant ramifications for the country where common people and political parties hold divergent views on the subject.
- The apex court had on November 25, 2022 sought the Centre's response to separate pleas moved by two gay couples seeking enforcement of their right to marry and a direction to the authorities concerned to register their marriages under the Special Marriage Act.

UNION AGRICULTURE MINISTER LAUNCHES SEED TRACEABILITY PORTAL AND MOBILE APP



Why in news?

- Recently, the Union Agriculture and Farmers Welfare Minister launched the SATHI (Seed Traceability, Authentication and Holistic Inventory) Portal and Mobile App.
- It is a Centralized Online System for seed traceability, authentication and inventory designed to deal with the challenges of seed production, quality seed identification and seed certification.

Collaboration:

- It has been developed by the NIC in collaboration with the Union Ministry of Agriculture and Farmers Welfare on the theme of 'Uttam Beej - Samridh Kisan'.

SATHI portal:

- The first phase of SATHI (Seed Traceability, Authentication and Holistic) portal has just been launched.
- Efforts should be made to increase awareness so that the farmers get full benefit from it. There will be a QR code under this system, through which the seeds can be traced.
- Training should be imparted through Indian Council of Agricultural Research (ICAR), Krishi Vigyan Kendras and State Governments.

Quality assurance:

- SATHI portal will ensure quality assurance system, identify the source of seed in the seed production chain.

- ⇒ The system will consist of integrated 7 verticals of the seed chain:
 - a) Research Organisation,
 - b) Seed Certification,
 - c) Seed Licensing,
 - d) Seed Catalogue,
 - e) Dealer to Farmer Sales,
 - f) Farmer Registration and
 - g) Seed DBT.
- ⇒ Seeds with valid certification can only be sold by valid licensed dealers to centrally registered farmers who will receive subsidy through DBT directly into their pre-validated bank accounts.
- ⇒ Data Sharing Portal will allow sharing of eShram beneficiaries data with the respective States and Union Territories in a secured manner for targeted implementation of social security/welfare schemes for the unorganised workers registered on eShram.
- ⇒ Recently, Ministry initiated mapping of different schemes data with eShram data to identify the eShram registrants who have not yet received the benefits of these schemes.
- ⇒ This data is also being shared with States/UTs based on which, States/UTs can identify unorganised workers who have not yet received benefit of the social welfare/security schemes and provide schemes' benefit to them, on priority.

NEW FEATURES IN ESHRAM PORTAL LAUNCHED



Why in news?

- ⇒ Recently, the Union Minister for Labour & Employment launched new features in eShram Portal.

Key Highlights:

- ⇒ The new features added in eShram portal will enhance the utility of the portal and facilitate ease of registration for unorganised workers.
- ⇒ The eShram registered workers can now connect with Employment opportunities, Skilling, Apprenticeship, Pension Scheme, Digital Skilling and States' schemes through eShram portal.
- ⇒ A feature of capturing family details of migrant worker has been added to the eShram portal. This feature can help in providing Child education and women centric schemes to the migrant workers who have migrated with family.
- ⇒ Further, a new feature on sharing of data of construction workers registering on eShram with the concerned Building and Other Construction Workers' (BOCW) Welfare Board, has been added to ensure registration of eShram construction workers with the respective BOCW board and access to the schemes meant for them.

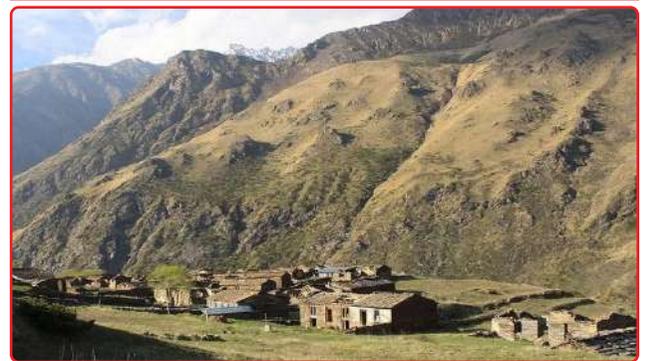
Data Sharing Portal (DSP):

- ⇒ He also formally launched Data Sharing Portal (DSP) for sharing of eShram data with the State/ UT Governments.

About eShram portal:

- ⇒ The Ministry of Labour & Employment launched eShram portal on 26th August 2021 to create a comprehensive National Database of Unorganised Workers which is seeded with Aadhaar.
- ⇒ As on 21st April 2023, over 28.87 crore unorganised workers have registered on eShram portal.

VIBRANT VILLAGES PLAN TO BE MERGED WITH PM GATI SHAKTI



Why in news?

- ⇒ The Centre's ambitious Vibrant Villages Programme (VVP), which aims to develop infrastructure and open up villages along the China border to tourists, will be integrated with the Prime Minister's Gati Shakti mega project.
- ⇒ The digital platform of the Gati Shakti project brings 16 Ministries, including Railways and Highways, together for integrated planning and coordinated implementation of infrastructure connectivity projects and allows departments to break operational silos.

Integration with BISAG-N:

- ⇒ The Bhaskaracharya National Institute for Space Applications and Geoinformatics (BISAG-N) in Gujarat has been roped in to provide satellite images and GIS mapping of the projects that will be taken up under the scheme.

⇒ BISAG-N will be tracking the infrastructure and other land-use changes in the border villages for real-time monitoring.

Objective:

- ⇒ One of the objectives of the Vibrant Villages Programme is to stop migration of border population.
- ⇒ The objective is to motivate people to continue to stay there and it will also help to gather intelligence from the people of border villages.

Background:

- ⇒ On February 15, the Union Cabinet approved the programme to cover 2,967 villages in 46 border blocks of 19 districts in four States and one Union Territory along the China border. Of these, 662 villages will be prioritised for coverage.
- ⇒ The scheme has been allocated ₹4,800 crore for the financial years 2023-24, 2024-25 and 2025-26. The amount allocated for road construction is ₹2,500 crore.

INTERNATIONAL RELATIONS

INDIA, MALAYSIA MOVE BEYOND DOLLAR TO SETTLE TRADE IN RUPEE



Why in news?

- ⇒ Recently, the India and Malaysia have agreed to settle trade in the Indian rupee.

Why de-dollarisation?

- ⇒ The announcement came against the backdrop of ongoing official efforts to safeguard Indian trade from the impact of Ukraine crisis.
- ⇒ The shift away from the U.S. dollar, which has been the dominant reserve currency for international trade so far, has added significance as it indicates that India is willing to take concrete steps towards de-dollarisation of its international trade.

Details:

- ⇒ The Union Bank of India said that it has become the first bank in India to operationalise this option by opening a Special Rupee Vostro Account through its "corresponding bank" in Malaysia, India International Bank of Malaysia.

⇒ "Trade between India and Malaysia can now be settled in Indian Rupee (INR) in addition to the current modes of settlement in other currencies. This follows the decision by the Reserve Bank of India in July 2022 to allow the settlement of international trade in the Indian Rupee (INR).

⇒ This initiative by RBI is aimed at facilitating the growth of global trade and to support the interests of the global trading community in Indian rupees.

Background:

⇒ Trading in the U.S. dollar has faced growing difficulties, especially after the Russian economy was sanctioned by the Western powers following President Vladimir Putin's launch of a so-called "special military operation" against Ukraine on February 24, 2022.

⇒ As a fallout of the sanctions and war-making, payments to Russia in U.S. dollars became increasingly difficult, which in turn triggered a search for solutions in national currencies and de-dollarisation worldwide.

⇒ On March 14, the government had informed the Rajya Sabha that banks from 18 countries were allowed by the RBI to open Special Rupee Vostro Accounts to settle payments in the rupee.

Economic Gain:

⇒ This mechanism will allow the Indian and Malaysian traders to invoice the trade in Indian rupee and therefore achieve better pricing for goods and services traded.

⇒ This mechanism is expected to also benefit the traders on both sides as they can directly trade in Indian Rupee and therefore save on currency conversion spreads.

India-Malaysia bilateral trade:

⇒ The India-Malaysia bilateral trade touched \$19.4 billion during 2021-22 and Saturday's announcement is expected to help bilateral trade to overcome currency-related obstacles.

⇒ Malaysia is the third largest trading partner of India in the ASEAN region, after Singapore and Indonesia that account for \$30.1 billion and \$26.1 billion bilateral trade with India respectively.

INDIA ELECTED TO UN STATISTICAL BODY FOR 4-YR TERM

Why in news?

⇒ India has been elected to the highest statistical body of the United Nations for a four-year term beginning January 1, 2024.

Details:

⇒ India won handsomely in the UN Statistical Commission election securing 46 out of 53 votes, leaving rivals Republic of Korea (23) China (19) and the United Arab Emirates (15) far behind.

- ⇒ India's expertise in the field of statistics, diversity and demography has earned it the seat on the UN Statistical Commission.

About UNSC:

- ⇒ The United Nations Statistical Commission is a Functional Commission of the UN Economic and Social Council established in 1946.
- ⇒ Since July 1999 the Commission meets every year, as set forth by the Economic and Social Council.
- ⇒ It oversees the work of the United Nations Economic and Social Council.

INDIA, JAPAN AGREE TO DIVERSIFY DEFENCE COOPERATION IN EMERGING DOMAINS



Why in news?

- ⇒ Recently, the seventh edition of India-Japan Defence Policy Dialogue took place in Delhi.
- ⇒ India and Japan agreed to diversify their defence cooperation in new and emerging domains like space and cyber as part of an aim to consolidate the overall strategic engagement.

Key Highlights:

- ⇒ India invited Japanese defence industries to look at investment opportunities in India under the 'Make in India' initiative.
- ⇒ A wide range of issues, including service-level exercises and engagements, regional security issues and cooperation in defence equipment and technology, were discussed during the meeting.
- ⇒ The Japan presented policy updates from their recently released National Security Strategy and National Defence Strategy.
- ⇒ Japan emphasised that both the countries should aim to deepen collaboration between the respective defence industries.
- ⇒ They welcomed the conduct of the inaugural fighter exercise 'Veer Guardian' between the Indian Air Force and Japanese Air Self Defence Force in January 2023 in Japan.

Defence Policy Dialogue:

- ⇒ The Defence Policy Dialogue is an institutional mechanism between India and Japan to discuss bilateral defence cooperation.

INDIA, MAURITIUS REVIEW VOSTRO ACCOUNT MECHANISM, IMPLEMENTATION OF CECPA



Why in news?

- ⇒ Recently, India and Mauritius took stock of the bilateral cooperation during Indian Foreign Secretary's three-day visit to Mauritius.
- ⇒ It was the foreign secretary's first official visit to Mauritius, a key partner and trusted friend of India under India's 'neighbourhood first' policy and SAGAR (Security and Growth For All in the Region) vision for the Indian Ocean.

Key Highlights:

- ⇒ Both sides carried out a comprehensive review of their overall ties including the vostro account mechanism for settlement of trade transactions and the proposed launch of Indian Unified Payments Interface (UPI) system and RuPay card in the African country.

The two sides

- ⇒ Both sides also delved into their Comprehensive Economic Cooperation and Partnership Agreement (CECPA), which was inked on February 22, 2021.
- ⇒ Both sides expressed satisfaction regarding the smooth execution of the various projects including the phase IV of the Metro, civil services college, the solar power plant at Henrietta, forensics science lab, national archives and library, Mauritius police academy and mediclinic and area health centres.
- ⇒ Both sides also reviewed ongoing cooperation in diverse areas, such as the Ayush Centre of Excellence (ACE), Special Rupee Vostro Account mechanism for settlement of bilateral trade transactions and proposed launch of India's UPI Payment System and RuPay card in Mauritius.

Vostro accounts:

- ⇒ A vostro account is an account that domestic banks hold for foreign banks in the former's domestic currency, in this case, the rupee.
- ⇒ Domestic banks use it to provide international banking services to their clients who have global banking needs.
- ⇒ It is an integral offshoot of correspondent banking that entails a bank (or an intermediary) to facilitate

wire transfer, conduct business transactions, accept deposits and gather documents on behalf of the other bank.

- It helps domestic banks gain wider access to foreign financial markets and serve international clients without having to be physically present abroad.

INDIA BRACES TO EVACUATE NATIONALS FROM SUDAN



Why in news?

- Recently, India has started Operation Kaveri to evacuate its nationals from conflict-torn Sudan.
- Nearly 3,000 Indians are stuck in various parts of Sudan, including the national capital, Khartoum, and distant provinces such as Darfur.

Why named as 'Operation Kaveri'?

- The Choice of naming this operation as 'Operation Kaveri' has a lot of significance.
- The Kaveri is one of the major Indian rivers flowing through the southern states of Karnataka and Tamil Nadu. The river is sacred to the people of the region and is worshipped as the Goddess Kaveriamma (mother Kaveri).
- Rivers reach their destination irrespective of barriers. It's like a mother who will ensure she will bring her children back to safety.

Recent events:

- India had earlier stationed two C-130J heavy-lift aircraft in Jeddah and sent INS Sumedha to Port Said for the operation.
- The evacuation acquired urgency in view of the total breakdown of essential services in Sudan. Food and water are in short supply, and there is power outage.
- Indians in the region have reached out to the government, showing videos of indiscriminate attacks that also targeted residences of the Indian community and looting of essential items by the rebel paramilitary.

Background:

- The political crisis in Sudan turned into a countrywide armed conflict on April 15 after a disagreement between the paramilitary Rapid Support Forces

(RSF) and the Sudanese Armed Forces (SAF) over the Security Sector Reform (SSR) spiralled into an armed confrontation between the commanders of the two wings.

- The conflict left hundreds of Indians stranded at the airport in Khartoum. They subsequently took shelter in nearby hotels as fighting intensified.

INDIA, BANGLADESH AGREE TO SETTLE BILATERAL TRADE TRANSACTIONS IN RUPEE



Why in news?

- Bangladesh and India have agreed to settle a part of the bilateral trade transactions in their own currencies Rupee and Taka to ease pressure on dollar holdings.

Details:

- In order to facilitate cross-country transactions, Sonali Bank and Eastern Bank will open accounts in the State Bank of India and ICICI Bank. The two Indian banks will also open similar accounts in the two Bangladeshi banks.
- The opening of these accounts known as vostro and nostro accounts in global accounting will need the approval of respective central banks.
- Bilateral trade with India in taka and rupee will reduce pressure on the US dollar.

Bilateral trade:

- Bangladesh's import from India in the last fiscal year was around USD 13.69 billion. Of which, USD 2 billion will be traded in rupees while the rest will be paid in US dollars.
- Meanwhile, exports from Bangladesh to India were about USD 2 billion and transactions regarding these will be made in rupees and takas.
- A delegation from the Reserve Bank of India (RBI) and the State Bank of India (SBI) visited Dhaka in April to discuss transaction processes between the two nations.

Way Forward:

- It is expected the arrangement will promote trade and reduce pressure on forex reserves, as per the news report.

ECONOMY

INDIA POST PAYMENTS BANK LAUNCHES WHATSAPP BANKING SERVICES

**Why in news?**

- Recently, the India Post Payments Bank (IPPB), in collaboration with Airtel, announced the launch of WhatsApp Banking Services for IPPB customers in New Delhi, enabling them to access banking services on their mobile phone.

Key Highlights:

- The newly launched IPPB WhatsApp Banking channel will enable IPPB customers to seamlessly connect with the bank on WhatsApp and effortlessly avail a host of banking services, including doorstep service request, locating nearest Post Office and much more.
- Airtel has been working with IPPB to deliver as many as 250 million messages per month to the bank's customers many of whom are located in mofussil towns and tier 2,3 cities.
- The addition of the WhatsApp messaging will add to customer's accessibility to connect with the bank on their fingertips, furthering Digital India mission of the Government, as part of which IPPB has been working tirelessly to deliver banking services in the rural pockets of the country.

Multi-lingual:

- In line with the ambition of the Government to bring digital and financial inclusion to citizens in their language, the Airtel – IPPB WhatsApp Banking solution is also working on to build multi-language support, enabling added convenience to customers, especially to those in the rural parts of the country to access banking services in their preferred language.

Way Forward:

- The IPPB and Airtel IQ are working towards further integrating a LIVE interactive customer support agent into the WhatsApp solution which will enable customers to access 24x7 support and get quick resolutions for their queries.

MINISTRY SAYS MGNREGS WORKERS WILL BUILD ALMOST 75% OF ANGANWADIS IN 2023

**Why in news?**

- Almost three out of every four anganwadi centres to be constructed in 2023 will be built in convergence with the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), the Women and Child Development Ministry has said.

Financial allocation:

- The Ministry has informed the Parliamentary Standing Committee on Education, Women, Youth and Sports that the ₹12 lakh cost of construction of each anganwadi would also be split, with ₹8 lakh being provided under MGNREGS.
- The remaining ₹4 lakh will be paid by the Central and State governments in equal amounts.

Demand of anganwadi centres:

- There was a demand for 27,000 anganwadi centres in the country in the current year, out of which 20,000 are to be constructed under MGNREGS.
- The government has also identified 40,000 anganwadi centres for upgradation in aspirational districts across the country this year.
- The Centre has also informed State governments that under the Saksham Anganwadi and Poshan 2.0 schemes, it is proposed that States may seek CSR funds on their own discretion, apart from accepting donations from individuals, companies, business houses and institutions of repute for construction of anganwadis.
- The Ministry also requested all States to revisit the actual requirements of anganwadi centres vis-à-vis the population of the area, the number of children actually attending, and the number of centres already available, and then furnish a detailed proposal.

About Anganwadi:

- Anganwadi is a centrally sponsored scheme implemented by the States / UTs which serves as a rural child and maternal care centre in India.
- It was started by the Government of India in 1975 as part of the Integrated Child Development Services program to combat child hunger and malnutrition.

- ⇒ Anganwadi centres provide a package of six services: supplementary nutrition, pre-school non-formal education, immunisation, health check-up, nutrition and health education, and referral services.
- ⇒ The beneficiaries under the Anganwadi Services Scheme are identified on the basis of Aadhaar.

FAMOUS BASOHLI PAINTING FROM JAMMU AND KASHMIR KATHUA GETS GI TAGGING



Why in news?

- ⇒ The world-famous Basohli painting from Jammu and Kashmir's Kathua district has obtained the Geographical Indication (GI) Tag following an approval by the National Bank for Agriculture and Rural Development (NABARD).

What is GI tag?

- ⇒ The GI tag to a product, goods or speciality grants legal protection to the original producers and prevents their unauthorised use by third parties.
- ⇒ It also boosts exports, promotes the goods at the international level and brings economic prosperity to producers and stakeholders.

GI tags from J& K region:

- ⇒ Besides the Basohli paintings, Basohli pashmina woolen products (Kathua), Chikri wood craft (Rajouri), Baderwah rajma (Doda), Mushkbadji rice (Anantnag), Kaladi (Udhampur), Sulai honey (Ramban), Anardana (Ramban) and Ladakh wood carving (Ladakh) were the other products pitched for the GI-tagging.
- ⇒ These products from Jammu and Kashmir have been included among 33 others, highest-ever in a single year, cleared for GI-tagging.

About Basohli painting:

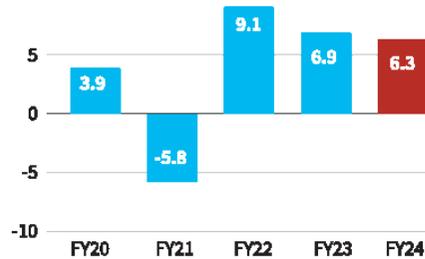
- ⇒ Basohli painting of Kathua is the first independent GI tagged product from Jammu region.
- ⇒ Basohli, a town in the Jammu region, was the cradle of Pahari paintings. It gave birth to a unique style of miniature paintings that witnessed a fusion of mythology and traditional folk art.
- ⇒ It was under Sangram Pal (1635-1673) and later Kirpal Pal (1678-1693) that Basohli paintings flourished. Vaishnavism was adopted under Sangram Pal and hence the early paintings, specifically the Rasmanjari series, depict Krishna as the protagonist.

- ⇒ The most distinctive feature of these paintings was the portrayal of jewellery- embossed white paint was used for pearls and the wing-case of beetles for emerald green.

WORLD BANK LOWERS INDIA'S GROWTH FORECAST TO 6.3%

A slowdown in growth

The World Bank has revised down India's growth projection for FY24 to 6.3% from 6.6% estimated a few months ago citing rising borrowing costs and current global economic situation



■ The chart shows the estimated GDP growth for India between FY20 and FY24

Why in news?

- ⇒ Recently, the World Bank released its, 'South Asia Economic Focus: Expanding Opportunities: Toward Inclusive Growth' report.

Key Highlights:

- ⇒ The World Bank has forecast a 6.3% economic growth rate for India in the current fiscal year, which ends March 31, 2024, a downgrade of 0.7 percentage points since its October forecast.
- ⇒ The Indian economy is expected to grow at 6.4% in FY 2024-25, an upgrade of 0.3 percentage points from the previous forecast.
- ⇒ The primary reasons for this are high borrowing costs and slower income growth causing weaker consumption, as well as the government tightening fiscal expenditure.
- ⇒ The South Asia region as a whole is expected to grow at 5.6% this calendar year.
- ⇒ While India fared better than the rest of the South Asian region, two major concerns were the female labour participation rate, which had dropped to below 20% and the informal sector neither becoming more productive nor shrinking.

Sri Lanka & Pakistan:

- ⇒ The outlook for India's neighbours Sri Lanka and Pakistan was bleaker. The World Bank forecast for Sri Lanka this calendar year was -4.3% (i.e., a contraction) and for Pakistan was 0.4% for the year ending June 30, 2023.
- ⇒ The political uncertainty in Pakistan made making decisive reforms harder and it was important to have wide buy-in for the "reform process".
- ⇒ Pakistan is negotiating the release of a \$1.1 billion tranche of a larger \$6.5 billion bailout package with

the International Monetary Fund (IMF), which has been delayed.

- ⇒ Sri Lanka, which faced economic collapse last year, negotiated a \$3 billion loan from the IMF at the end of March and is hoping to secure further financing from international institutions.

PARLIAMENTARY PANEL ASKS GOVT TO TAKE STEPS TO REVIVE LOSS-MAKING PSUS



Why in news?

- ⇒ A high-level Parliamentary panel of Rajya Sabha on industry headed by DMK MP Tiruchi Siva presented report in the Parliament during the recently concluded budget session.

Details:

- ⇒ Out of the 16 operational Central Public Sector Enterprises (CPSEs) under the administrative control of the heavy industries ministry, five CPSEs including Heavy Engineering Corporation (HEC) and Hindustan Machine Tools (HMT) are making losses.
- ⇒ The high-level Parliamentary panel has expressed concern over this fact and also noted that a number of CPSEs under the ministry's administrative control are gradually decreasing.
- ⇒ The panel has asked the heavy industries ministry to work towards enhancing the performance of CPSEs under its control and adopt restructuring measures to revive the loss making units, so that no further closure of PSUs takes place.

Heavy Engineering Corporation:

- ⇒ HEC has been a loss-making enterprise continuously for the past several years, yet a meagre token amount of Rs 0.01 crore has been kept as a budgetary support for it for 2023-24.
- ⇒ The committee thus has recommended that the ministry should make concerted efforts to improve the situation of HEC and if need arises, may seek additional funds at the "revised estimate" stage.
- ⇒ The ministry should also give details of the steps taken and plans conceived to revive and strengthen the CPSEs within its administrative ambit to the panel.

Other loss-making units:

- ⇒ Apart from HEC and HMT, the other loss making PSUs under the ministry's control are Engineering

Projects (India) Limited (EPIL), Rajasthan Electronics and Instruments Limited (REIL) and NEPA Ltd.

- ⇒ The committee also expressed dismay that year after year the number of CPSEs under the control of the heavy industries ministry are decreasing.

Way Forward:

- ⇒ It has recommended that the Ministry should do a serious and holistic analysis of the causes that are making its PSEs sick and loss-making, and make concerted efforts for their revival and restoration.

INDIA FIRST SEMI HIGH SPEED REGIONAL RAIL SERVICES NAMED RAPIDX



Why in news?

- ⇒ India's first semi-high-speed regional rail services have been named 'RAPIDX' by the National Capital Region Transport Corporation (NCRTC).

Details:

- ⇒ The trains will run on the Regional Rapid Transit System (RRTS) corridors, being implemented to connect key urban nodes across the National Capital Region (NCR).
- ⇒ The green leaf symbol in the logo is the highlight of the brand's aim towards decarbonisation by not only decongesting NCR by reducing the number of vehicles on the road but also by the use of green energy.

Joint venture:

- ⇒ It is a joint venture company of the Union government and states of Delhi, Haryana, Rajasthan and Uttar Pradesh.
- ⇒ The NCRTC is tapping green energy by the installation of solar panels on stations and depots as well as the use of blended power in traction which is planned to be increased progressively.

Way Forward:

- ⇒ The RAPIDX services on the first Delhi-Ghaziabad-Meerut RRTS corridor will bring down the travel time between Delhi to Meerut significantly.
- ⇒ The NCRTC is targeting to commission the entire Delhi-Ghaziabad-Meerut corridor for the public by 2025.
- ⇒ Before that, it will operationalise a 17-km long priority section between Sahibabad and Duhai in 2023, before its scheduled time.

ACCORDING TO IMF INDIA SET TO GROW BY 5.9 PERCENT THIS FISCAL



Why in news?

- Recently, the International Monetary Fund (IMF) lowered India's economic growth projection for the current fiscal to 5.9 per cent from 6.1 per cent earlier. Yet India will continue to be the fastest-growing economy in the world.
- In its annual World Economic Outlook, IMF also lowered the forecast for 2024-25 fiscal (April 2024 to March 2025) to 6.3 per cent from the 6.8 per cent it had predicted in January 2023.

Details:

- The growth rate of 5.9 per cent in the 2023-24 fiscal compares to an estimated 6.8 per cent in the previous year.
- IMF growth forecast is lower than projections by the Reserve Bank of India (RBI). RBI sees a 7 per cent GDP growth in 2022-23 and a 6.4 per cent in the current fiscal that started on April 1. The government is yet to release full-year GDP numbers for 2022-23.
- Despite a significant drop in growth rate projections from 6.8 per cent in 2022 to 5.9 per cent, India continues to be the fastest-growing economy in the world.

China:

- China's growth rate is projected to be 5.2 per cent in 2023 and 4.5 per cent in 2024 against its growth rate of three per cent in 2022.
- On the surface, the global economy appears to be poised for a gradual recovery from the powerful blows of the pandemic and Russia's unprovoked war on Ukraine.
- China is rebounding strongly following the reopening of its economy. Supply-chain disruptions are unwinding, while the dislocations to energy and food markets caused by the war are receding.

Global scenario:

- The global growth will bottom out at 2.8 per cent in 2023 before rising modestly to 3.0 per cent in 2024. Global inflation will decrease, although more slowly than initially anticipated, from 8.7 per cent in 2022 to 7.0 per cent this year and 4.9 per cent in 2024.

- In 2023, the economic slowdown is concentrated in advanced economies, especially the euro area and the United Kingdom, where growth is expected to fall to 0.8 per cent and -0.3 per cent this year before rebounding to 1.4 and 1 per cent, respectively
- By contrast, despite a 0.5 percentage point downward revision, many emerging market and developing economies are picking up, with year-end to year-end growth accelerating to 4.5 per cent in 2023 from 2.8 per cent in 2022.

Suggestion:

- If the recent financial sector stresses are contained, the IMF projects global growth to settle at 3.0% five years from now, this is the lowest five-year projection in decades.
- The IMF suggested that central banks remain steady with their anti-inflation stance, but also adjust and use their full set of policy instruments, while providing targeted support for those hit by the cost of living crisis.

U.S. AVIATION WATCHDOG RETAINS INDIA'S SAFETY CATEGORY AFTER REVIEW

Why in news?

- The aviation safety regulator of the U.S., the Federal Aviation Administration (FAA), has retained the "Category 1" status for India's aviation safety oversight following a review.

Details:

- The FAA, which is part of the US Department of Transportation, had conducted an audit of the Indian regulator DGCA from 25 to 29 October, 2021, in the areas covering aircraft operations, airworthiness and personnel licensing under its International Aviation Safety Assessment (IASA) programme.
- Under the IASA, the FAA determines whether a country's oversight of its air carriers that operate or seek to operate in the US or codeshare with a US air carrier complies with safety standards established by the United Nations International Civil Aviation Organization (ICAO).

What it means for India?

- A codeshare is a commercial arrangement between airlines whereby one sells seats on a flight operated by the other, with each airline using their own flight number.
- FAA's IASA focuses on a country's ability to adhere to the international safety standards and recommended practices.
- Air carriers of Category 1 countries are permitted to operate/ expand their services to destinations in the US and codeshare with US air carriers.

India's scores:

- The FAA conducted the programme over a one-year period which included physical audits from October

25 to October 29, 2021 and a review in July and September, 2022.

- In the recent ICAO audit in November 2022, India scored an Effective Implementation (EI) of 85.65% from the previous EI of 69.95%.

CONSUMER INFLATION SLIDES BELOW 6% MARK FOR FIRST TIME IN 2023



Why in news?

- India's retail inflation slid below the 6% mark for the first time in 2023 and only the third time in the last 15 months to touch 5.66% in March 2023.
- The steep drop in headline inflation was aided by a high base effect, which is expected to keep the inflation rate lower at least in the entire first quarter of 2023-24.
- March's inflation level was last seen in December 2021, following which prices rose at a pace faster than the Central bank's upper tolerance threshold of 6% for 10 months in a row.

RBI projections:

- Despite the moderation in March, Indian consumers faced an average inflation of 6.66% through 2022-23. This is higher than the 6.5% average price rise projected by the Reserve Bank of India (RBI) in February.
- While pausing interest rate hikes to check inflation in its monetary policy review, the RBI has projected price rise to moderate to 5.2% in 2023, with the April to June quarter averaging 5.1% inflation. The same quarter had clocked an average price rise of 7.28% in 2022.

Key Highlights:

- Rural consumers saw a sharper dip in inflation as it eased from 6.72% in February to 5.51% in March, while the statistical relief for their urban counterparts was minimal, as their price rise dropped only marginally from 6.1% to 5.89% over the same period.
- Within food items, vegetables remained in deflationary mode, with prices dropping 8.5% year-on-year.
- Oil prices also fell for the second month in a row, with the price correction from a year ago quickening from 0.5% in February to 7.9% in March.
- Meat and fish prices dropped 1.4% last month from March 2022 levels, as opposed to a 3.4% inflation recorded this February.

Cereals:

- However, cereals, milk and spices inflation remained significantly high, while fruit prices surged 7.6% in March compared to 6.4% in February.
- Price rise in cereals eased only marginally from 16.7% in February to 15.3% in March. Similarly, milk inflation dropped slightly from 9.65% to 9.31% in February, while spices inflation was 18.2% in March after a three-month spell over 20%.

Way Forward:

- Assuming normal southwest monsoon rains and only a limited impact from unseasonal rain in March, food inflation is expected to ease notably and fuel prices to trend down this year.

PROPOSAL FOR SABARIMALA GREENFIELD AIRPORT RECEIVES CENTRAL APPROVAL



Why in news?

- The plan to establish the Sabarimala greenfield airport at Erumely has received a major boost with the project proposal receiving approval from the Union Ministry of Civil Aviation.
- The approval was granted after reviewing the techno-economic feasibility study report presented by the Kerala government.

Details:

- The proposed airport will have a 3.5-km-long runway with adequate width to enable the operation of aircraft of all sizes.
- Upon completing land acquisition, the detailed project report will be formulated, followed by the constitution of a Special Purpose Vehicle to execute the project.

Land acquisition:

- As per a recent government order, 2,570 acres of land in Erumely South and Manimala villages will be acquired for the airport, including 307 acres of land outside the Cheruvally Estate.
- Although a civil dispute is pending in a sub-court between the government and Believers' Church over the ownership of the estate, which constitutes a major portion of the project area, it is unlikely to impact the acquisition process under the The Land Acquisition,

Rehabilitation, and Resettlement (LARR) Act as the government can proceed with the acquisition by depositing the property's value in the court.

Way Forward:

- At present, the social impact assessment (SIA) study for the project is in its final stage, while the environment impact assessment (EIA) is nearing completion.

About RFCTLARR Act:

- The Department of Land Resources in the Ministry of Rural Development is the nodal agency for matters relating to land acquisition.
- Acquisition of land for various projects is done by concerned State Governments/ UT Administrations as per provisions laid down in the Land Rehabilitation Act, 1894 as well as under the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (RFCTLARR Act, 2013).

ROPEWAY UNDER PARVATMALA PARIYOJANA GOVERNMENT



Why in news?

- Union Minister for Road Transport and Highways recently addressed 'INTERALPIN 2023 Fair', the Leading International Trade Fair for Alpine Technologies at Innsbruck, Austria.
- The fair brings together key industry players, service providers, and decision-makers from the Cable Car industry.

Parvatmala Pariyojana:

- He said under "Parvatmala Pariyojana", the Government of India plans to develop 250+ projects with a Ropeway length of 1,200+ km over 5 years.
- The focus is on PPP under Hybrid Annuity Model with 60% contribution support by Government of India.
- India is promoting the manufacturing of ropeway components under the "Make in India" initiative.

Way Forward:

- India is encouraging the Austrian & European industries to participate in enhancement of existing ropeway standards to ensure sustainable and safer

transport and to be a part of this transformational journey.

CENTRE TO PROVIDE RS 1 CRORE AID TO STATES FOR OPENING 100 FOOD STREETS



Why in news?

- The Union Health Ministry, in partnership with the Ministry of Housing and Urban Affairs, has asked states and union territories to develop 100 food streets in 100 districts across the country.
- The Centre has taken this endeavour to maintain clean and safe food practices.

Focus:

- As a pilot project to serve as a model for other food streets, the project's goal is to encourage safe and healthy food practices among food enterprises and community members, hence reducing foodborne illnesses and improving overall health outcomes.
- Safe food practices not only promote 'eat right campaign' and food safety, but will improve hygiene, credibility of local food businesses, boost local employment, tourism and in turn, the economy. It also leads to a cleaner and greener environment.

Why it matters?

- In Indian society, street food has long played an important role and is abundantly available.
- In addition to supplying millions of people with a low-cost daily diet, street food benefits the tourism industry by directly employing a large number of people.
- According to the Union Health Ministry, food safety and hygiene at street food shops and hubs remain a concern.
- While increased urbanisation has resulted in easier access to food, it has also exacerbated the issue of food contamination and associated health risks due to unsanitary and dangerous food practices.

Financial assistance:

- Financial assistance for the initiative will be provided to states and UTs in the form of Rs 1 crore per food street or district to fill critical gaps.
- In 100 districts across the country, 100 such food streets will also be established.

- ⇒ This assistance will be provided in the ratio of 60:40 or 90:10 under the National Health Mission (NHM), with the condition that standard branding of these food streets be done in accordance with Food Safety Standard Authority of India (FSSAI) guidelines.

Implementation:

- ⇒ The initiative will be implemented through the National Health Mission (NHM) in convergence with the Ministry of Housing and Urban Affairs, with technical support from the FSSAI.

INTERNAL SECURITY

SLINEX-23



Why in news?

- ⇒ The 10th edition of India- Sri Lanka bilateral maritime exercise SLINEX-23 is scheduled at Colombo from 03 - 08 April 2023.

Key Highlights:

- ⇒ The exercise is being conducted in two phases: the Harbour Phase from 03-05 April 2023, followed by a Sea Phase from 06-08 April 2023.
- ⇒ Indian Navy is being represented by INS Kiltan, an indigenous Kamorta class ASW corvette and INS Savitri, an Offshore Patrol Vessel.
- ⇒ The Sri Lanka Navy is being represented by SLNS Gajabahu and SLNS Sagara. Maritime Patrol Aircraft, helicopters and Special Forces from both the sides would also participate in the exercise.

Background:

- ⇒ The previous edition of SLINEX was conducted off Visakhapatnam from 07-12 March 2022.
- ⇒ Exercise MITRA SHAKTI (Military Exercise) and Dosti Trilateral Exercise (Coast guard India, Maldives and Sri Lanka) are other exercises between India and Sri Lanka.

Way Forward:

- ⇒ SLINEX aims at enhancing interoperability, improving mutual understanding and exchanging best practices while jointly undertaking multi-faceted maritime operations.

CHINA MILITARY 'READY TO FIGHT' AFTER EXERCISES NEAR TAIWAN



Why in news?

- ⇒ Recently, China's military declared that it is "ready to fight" after completing three days of large-scale combat exercises around Taiwan that simulated sealing off the island in response to the Taiwanese President's recent trip to the U.S.

Joint Sword:

- ⇒ The "combat readiness patrols" named Joint Sword were meant as a warning to self-governing Taiwan, which China claims as its own.
- ⇒ The exercises were similar to the ones conducted by China in 2022 August, when it launched missile strikes on targets in the seas around Taiwan in retaliation for then-Speaker Nancy Pelosi's visit to Taiwan, but have been smaller and less disruptive.
- ⇒ The exercises serve both as intimidation and as an opportunity for Chinese troops to practice sealing off Taiwan by blocking sea and air traffic, an important strategic option the Chinese military might pursue in the event it uses military force to take Taiwan.

U.S. ship's trespassing:

- ⇒ The exercises this time have focused more on air strength, with Taiwan reporting 200 flights by Chinese warplanes in the past three days.
- ⇒ Meanwhile, to the south in the South China Sea, the U.S. 7th Fleet said its missile destroyer USS Milius sailed by China's Mischief Reef in a freedom of navigation operation.
- ⇒ China said the U.S. "illegally trespassed" into waters near the reef without its permission.

ENVIRONMENT

NORTH INDIA MAJOR GROUNDWATER DEPLETION HOTSPOT WITH 95% OF COUNTRY'S LOSS

Why in news?

- ⇒ According to a recent study by Indian Institute of Technology Gandhinagar (IIT-GN), North India

accounts for 95 per cent of the country's groundwater depletion and the rainfall increase in the future will be insufficient to fully recover the already depleted resources.



Basis of study:

- The study analysed data from the Central Groundwater Board (CGWB) in-situ groundwater well levels and satellite observations to study groundwater storage variability.
- They then used global climate model projections having different future warming scenarios for hydrological model simulations.
- The researchers also estimated the relative contribution of the groundwater pumping and recharge on the future changes in groundwater storage.

Key Findings:

- They found that the wettest historical and future periods support partial groundwater recovery despite the continuing abstraction from nonrenewable groundwater resources.
- The study shows that the projected increase in precipitation may not directly translate to an increase in ground water storage. Rise in potential evapotranspiration (PET) due to the warming climate can offset the positive impact of increase in rainfall.

Groundwater depletion in North India:

- The researchers also found that groundwater depletion in India will continue until excessive pumping is limited, leading to water sustainability issues in the future.
- The decline in precipitation and the rapid increase in tube wells for groundwater abstraction has resulted in excessive pumping of groundwater, leading to a severe depletion of groundwater resources in North India.
- In North and Central India, groundwater is mainly used for irrigation of rice and wheat crops during the pre and post-monsoon seasons.
- Nonrenewable (unsustainable) pumping has the dominant influence on groundwater storage, causing the water table to drop.

Situation in South India:

- The recent increase in groundwater storage in South India can be attributed to a rise in rainfall during the monsoon season.
- The limit of groundwater depletion is not yet clear; however, the depletion of deeper groundwater resources can make pumping water economically unviable.

Way Forward:

- It may be useful to shift crop growing and procurement areas or switch to less water-intensive cereals and improve water use efficiency in irrigation.

MOON TO BLOCK SUN IN RARE EVENT: WHAT IS HYBRID SOLAR ECLIPSE?



Why in news?

- A hybrid solar eclipse will take place on April 20 as the moon blocks the sunlight coming toward Earth.

Details:

- A hybrid solar eclipse involves all three areas of the Moon's shadow - the umbra, penumbra, and the antumbra, and then combines all three types of solar eclipses.
- The hybrid eclipse occurs when Earth travels through the area where the Moon's umbra (darkest part of the moon's shadow) meets its antumbra, a half-shadow that begins where the umbra ends.

What is Solar Eclipse?

- A solar eclipse is an astronomical phenomenon that occurs when the Moon passes between the Sun and Earth, blocking all or part of the Sun's light from reaching Earth. The Moon's shadow is cast on the Earth's surface, creating temporary darkness in some parts of the world that fall in its vicinity.
- There are three types of solar eclipses: total, partial, and annular.
- In a total solar eclipse, the Moon completely covers the Sun, and only the Sun's outer atmosphere (called the corona) is visible like a thin peel.
- In a partial solar eclipse, the Moon only partially covers the Sun, and a portion of the Sun's light is still visible.

- In an annular solar eclipse, the Moon appears smaller than the Sun, and a ring of the Sun's light is visible around the Moon.

What is hybrid solar eclipse?

- The solar eclipse will be a hybrid solar eclipse, a rare phenomenon that looks like an annular solar eclipse or a total solar eclipse depending on the location from where it is being observed.
- According to time and date, during the hybrid solar eclipse, Earth's curvature brings some sections of the eclipse path into the Moon's umbra, the darkest part of its shadow that creates total solar eclipses, while other areas remain outside the umbra's reach, causing an annular eclipse.
- Solar eclipses are in itself rare as they only occur about once every 18 months. They can only be seen from certain parts of the world, and those areas where the eclipse is visible will experience varying degrees of darkness.
- A solar eclipse also does not come alone and is accompanied by a lunar eclipse that happens a few weeks before or after the phenomenon.

ARMY MAY BUILD BAILEY BRIDGES IN KAZIRANGA TO PROTECT RHINO'S DOMAIN



Why in news?

- The Army may help build Bailey bridges in the Kaziranga National Park and Tiger Reserve for faster movement of forest guards in strategic, vulnerable pockets of the one-horned rhino domain.
- The Eastern Command of the Army has received a request from the Kaziranga authorities for setting up three Bailey bridges within the park.

Key Highlights:

- Bailey bridges sought would essentially replace wooden structures in flood-prone vulnerable pockets of the 889.51-sq.km park, also a UN World Heritage Site.
- These bridges would be at Mihi in Kohora, Kathparaghat in Bagori, and Rongamotia in the Agoratoli sector of the park.
- All the bridges would be 4 metres wide and between 30 metres and 100 metres in length.

Why Bailey bridges?

- Kaziranga has a total of 223 anti-poaching camps. Many of them are inundated during the floods. It may be a permanent solution to a communication problem, specifically during the floods.
- The bridges, off the tourist circuit tracks, are required for better connectivity in primarily inaccessible areas where wooden structures are often washed away during the monsoon.
- The bridges are expected to shorten the routes to the vulnerable pockets and facilitate better coordination among the forest guards manning the anti-poaching camps.

UN CALLS FOR OVERHAUL OF GLOBAL GOVERNANCE TO TACKLE CLIMATE CRISIS



Why in news?

- The global governance system should be redesigned for equipping it to tackle the current and future challenges of climate crisis to rising security threats, according to a new report by the United Nations (UN).

Details:

- Recently, the report, 'A Breakthrough For People and Planet: Effective And Inclusive Global Governance for Today And The Future', launched by the UN's High-Level Advisory Board (HLAB) on Effective Multilateralism, outlined an ambitious plan to overhaul the global governance system.
- The document also outlined an ambitious plan to strengthen multilateral systems to address the crises of rising inequality, lack of finance for sustainable development, gender divide and threats to democracy.

Effective multilateralism:

- Gender equality needs to be at the heart of a reinvigorated multilateral system that is people-centric, transparent, flexible and future-oriented, the report argued.
- Effective multilateralism is only possible if UN-mandated Sustainable Development Goals (SDG) on (gender equality and empowerment of all women and girls) are fully implemented and women and men are equally represented across all institutions and processes of global governance.

Six transformative shifts:

- HLAB, appointed by UN Secretary-General Antonio Guterres in March 2022, drafted 10 constituent principles of effective multilateralism.
- The principles are people-centric, representative, transparent, equitable, networked, mission-focused, flexible, accountable and future-oriented.

These principles are integrated into six transformative shifts that can help tackle the challenges; they are:

- a) Rebuild trust in multilateralism through inclusion and accountability
- b) Regain balance with nature by providing clean energy for all
- c) Ensure sustainable finance for all
- d) Support just digital transition
- e) Strengthen governance for current and emerging transnational risks

Our Common Agenda:

- These shifts are closely aligned with SDG and Our Common Agenda.
- 'Our Common Agenda' is an action plan designed to strengthen and accelerate multilateral agreements for making a tangible difference in people's lives.

Recommendations & Way Forward:

- The UN report also recommended strengthening the global architecture for peace, security and finance; delivering just transitions for climate and digitalisation and ensuring more equity in global decision-making.
- The solutions provided in this report will help existing and future generations to avoid the catastrophic implications of the current trajectory and secure a more sustainable, just and peaceful world for people and the planet.
- The report is launched ahead of the Summit of the Future, to be held on September 22-23, 2024 in New York.

PITTAS FIND NEW HAVEN IN ODISHA DISTRICTS



Why in news?

- In the first-ever census of mangrove pitta birds

carried out in two coastal districts of Odisha, 179 such birds were sighted.

Key Highlights:

- The first census of mangrove pitta (Pitta megharencha) birds was focused on the mangrove patches all along the coasts of Kendrapara and Jagatsingpur districts.
- The census was carried out by point count method, either by walking in the forest or using country boats in the creeks.
- The highest concentration of the birds has been found in the mangroves near the Mahipura river mouth inside the Bhitarkanika National Park.

Characteristics of Mangrove pitta:

- Mangrove pitta birds are a nearly threatened species found in a few pockets of eastern India, including Bhitarkanika in Odisha and the Sundarbans in West Bengal.
- The mangrove pitta is found in coastal mangrove forests of India, foraging on the ground and resting on the trees.

REVIVING A 'DEAD' RIVER, A CULTURAL EVENT TO CELEBRATE LEGACY OF YAMUNA



Why in news?

- The Yamuna, a river that environmentalists consider ecologically dead in Delhi, will now be the focus of a cultural push to renew India's civilisational and socio-religious connect with its waterbodies.

Riverine Cultures of India:

- In September, the Indira Gandhi National Centre for the Arts (IGNCA) will host a cultural programme on the banks of the river in Delhi, under its special project, 'Riverine Cultures of India' that began in 2018.
- The highlight of the event will be a short festival of films on waterbodies, shot by children from across the country.
- The programmes will include a photo exhibition comparing the Yamuna of today with what the river was like 50 years ago; symposia on various aspects such as ecology and conservation of India's rivers and their importance in the country's heritage; and an exhibition themed on 15 ghats across the country in Sanjhi or paper stencil art.

Rivers in focus:

- The larger project is focusing on six rivers right now: Ganga, Yamuna, and Sindhu in the north; and Krishna, Godavari, and Cauvery in the south.
- The project envisages festivals celebrating rivers in different cities, a study on these rivers in their contemporary context, and workshops along the banks involving environmentalists, cultural historians, anthropologists and folklorists.

Why Yamuna?

- Sources in the Ministry of Culture said that the government has tasked the IGNCA to conduct the cultural festival as a pilot for a bigger project on the Yamuna.
- The Yamuna's confluence with the Ganga and the mythical Saraswati at Triveni Sangam in Prayagraj is one of the country's most important pilgrimage spots for Hindus.
- However, the river had been declared "almost dead" by the Central Pollution Control Board (CPCB) in 2015 citing untreated waste flowing into it from several cities along its banks.
- The definition of a river is that it must have life, which is measured by its capacity to dissolve oxygen. The dissolved oxygen content in the Yamuna as it passes through Delhi is zero.

SEVEN WORST YEARS FOR POLAR ICE MELTING IN PAST DECADE: STUDY

**Why in news?**

- Scientists report that the seven worst years for polar ice sheets melting and losing ice have occurred during the past decade, with 2019 being the worst year on record.
- Combining 50 satellite surveys of Antarctica and Greenland taken between 1992 and 2020, the international team of researchers have found that the melting ice sheets now account for a quarter of all sea level rise, a five fold increase since the 1990s.

Key Highlights:

- In their study, the researchers found that earth's polar ice sheets lost 7,560 billion tonnes of ice between 1992 and 2020, which is equivalent to an ice cube that would be 20 km in height.

- They also found that the polar ice sheets have together lost ice in every year of the satellite record, and the seven highest melting years have occurred in the past decade.

Melting year:

- The satellite records showed that 2019 was the record melting year when the ice sheets lost a staggering 612 billion tonnes of ice.
- The loss, driven by an Arctic summer heatwave, led to record melting from Greenland peaking at 444 billion tonnes that year.
- Antarctica was found to have lost 168 billion tonnes of ice, the sixth highest on record, due to the continued speedup of glaciers in West Antarctica and record melting from the Antarctic Peninsula.
- The East Antarctic ice sheet was found to remain close to a state of balance, as it had throughout the satellite era.
- Melting of the polar ice sheets has found to cause a rise of 21 millimetre (mm) in global sea level since 1992, almost two thirds, or 13.5 mm, of which has originated from Greenland and one third, or 7.4 mm, from Antarctica.

Fivefold increase:

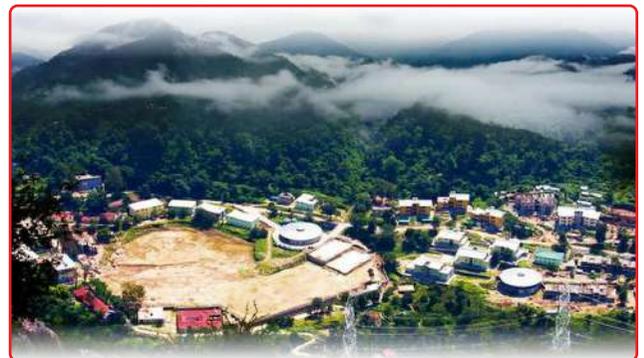
- The researchers say that there has been a fivefold increase in melting since the early 1990s. While ice sheet melting accounted for only a small fraction (5.6% of sea level rise), they are now responsible for more than a quarter (25.6% of all sea level rise).

SCIENCE & TECHNOLOGY

NOVEL CATALYST OFFERS TO MAKE HYDROGEN MORE VIABLE AS FUEL

Why in news?

- Researchers at the Indian Institute of Technology (IIT), Mandi, have developed a novel carbon-based catalyst to make water electrolysis more efficient, as well as being more stable and affordable than other catalysts that perform the same function.

**Traditional method:**

- The electrolysis of water, to split it into its constituent atoms using electricity consumes a lot of energy. The

traditional solution is to use a catalyst to induce the water molecules to split at a lower energy.

- Common catalysts are based on iridium and ruthenium, which are expensive and in great demand in other sectors.

Highlights of New study:

- In the new study, they reported a porous carbon material containing nitrogen that functions both as a catalyst and as the anode in electrolyzers, and could substitute the metal-based catalysts.
- The researchers produced this material, called 'laser carbon', by exposing a sheet of a polyimide polymer to a laser beam, carbonising the exposed bits and leaving the remainder rich in nitrogen.
- In an electrolyser, the nitrogen atoms drew electron clouds towards themselves, encouraging nearby carbon atoms to bond with atoms or molecules containing electron pairs. So, the location of these atoms became active sites for the oxygen evolution reaction (OER).

Oxygen Evolution Reaction (OER):

- The OER is a stumbling block in electrolysis because it has many intermediate steps and proceeds slower than the rest of the reaction cycle, thus reducing the energy efficiency.
- Laser carbon intervenes by reducing the OER overpotential: the difference between the voltage at which the OER takes place in reality and the minimum voltage at which it can take place. Lowering the overpotential allows OER to proceed vigorously.

Significance:

- The laser carbon is cheaper to produce, simpler to synthesise, and can be batch-manufactured with a laser in an environmentally friendly process, unlike other carbon-based catalysts.
- The production process increases the surface area laser carbon present to catalyse the reaction.

Way Forward:

- The material's catalytic activity is inferior to that of metal-based catalysts, it can be improved "in the fabrication process and use of other polymers".

ISRO'S REUSABLE LAUNCH VEHICLE LANDING TEST SUCCESSFUL

Why in news?

- Recently, the Indian Space Research Organisation (ISRO) successfully carried out the landing experiment of the Reusable Launch Vehicle-Technology Demonstration (RLV-TD) programme at the Aeronautical Test Range in Challakere, Chitradurga, Karnataka.

Details:

- An Indian Air Force (IAF) Chinook helicopter was used to drop the RLV-TD from an altitude of 4.5 km

and the ISRO executed the landing experiment of the RLV-TD as planned.

- The RLV took off by a Chinook helicopter as an underslung load and flew at a height of 4.5 km. Once the predetermined pillbox parameters were attained, based on the RLV's Mission Management and Computer command, the RLV was released mid-air, at a down range of 4.6 km. Release conditions included 10 parameters covering "position, velocity, altitude and body rates".



Achievements:

- For the first time in the world, a winged body has been carried to an altitude of 4.5 km by a helicopter and released for carrying out autonomous landing on a runway.
- The configuration of RLV-TD is similar to that of an aircraft and combines the complexity of both launch vehicles and aircraft.

What is RLV?

- RLV is ISRO's attempt at developing essential technologies for a fully reusable launch vehicle to enable low-cost access to space.
- ISRO has established itself as a cost-effective launch service provider in the billion-dollar satellite launch market and the new system will further strengthen its position.
- RLV is essentially a space plane with a low lift to drag ratio requiring an approach at high glide angles that necessitates a landing at high velocities of 350 kmph.
- ISRO had demonstrated the re-entry of its winged vehicle RLV-TD in the HEX mission in May 2016. The re-entry of a hypersonic sub-orbital vehicle marked a major accomplishment in developing Reusable Launch Vehicles.

ARCTIC SCIENTISTS RACE TO PRESERVE ICE MEMORY

Why in news?

- Arctic scientists are set to start drilling to save samples of ancient ice for analysis before the frozen layers melt away due to climate change.
- Italian, French and Norwegian researchers have set up camp in Norway's Svalbard archipelago in what

they called a race against time to preserve crucial ice records for analysing past environmental conditions.



Key Highlights:

- They will extract ice in a series of tubes from 125 metres below the surface, containing frozen geochemical traces dating back three centuries.
- One set of ice tubes will be used for immediate analysis while a second set will be sent to Antarctica for storage in an “ice memory sanctuary” under the snow, where the samples will be preserved for future generations.
- Analysis of chemicals in deep “ice cores” provides scientists with valuable data about past environmental conditions.
- But experts warn that water from melting ice is leaking down and altering the geochemical records preserved in ancient ice beneath.

Carbon emissions:

- Human-caused carbon emissions have warmed the planet by 1.1 degrees Celsius since the 19th century.
- Studies indicate that the Arctic is warming between two and four times faster than the global average.

Way Forward:

- The eight specialists have set up camp at an altitude of 1,100 metres on the crevasse-ridden Holtedahlfonna ice field and plan to start drilling.
- They will work for three weeks in temperatures as low as minus 25C (-13 Fahrenheit), cutting and pulling out a series of cylinders of ice, each one metre long and 10cm wide.

INDIA APPROVES INSTALLATION OF 10 NEW NUCLEAR REACTORS IN FIVE STATES

Why in news?

- Recently, the Centre has approved the installation of 10 nuclear reactors in five states across India. The information was given by Atomic Energy Minister Dr. Jitendra Singh in Parliament.
- The government has roped in public sector undertaking for the installation of the reactors.

Key Highlights:

- The Center has accorded administrative approval and financial sanction for 10 indigenous Pressurized

- Heavy Water Reactors of 700 MW each in fleet mode.
- The 10 reactors will come up in Karnataka, Haryana, Madhya Pradesh, and Rajasthan.
- Two nuclear reactors will each be installed in Kaiga, Chutka, and Gorakhpur nuclear power plants, while the Mahi Banswara nuclear power plant in Rajasthan will get four nuclear reactors.



Fleet mode:

- The Government has amended the Atomic Energy Act in 2015 to enable the Joint Ventures of NPCIL with Public Sector Enterprises to set up nuclear power projects.
- These reactors are planned to be set up in ‘fleet mode’ progressively by the year 2031 at a cost of Rs. 1,05,000 crores.

Installed nuclear power capacity:

- During 2021-22 the nuclear power reactors generated 47,112 million units of electricity, which comprises about 3.15 per cent of the total electricity generated in the country.
- The present installed nuclear power capacity is set to increase from 6780 MW to 22480 MW by 2031 on progressive completion of projects under construction and accorded sanction.

INDIA GRID COMMISSIONS ITS FIRST BATTERY ENERGY STORAGE SYSTEM PROJECT



Why in news?

- Recently, India Grid Trust commissioned its first battery energy storage system (BESS) project coupled with its solar panels at the Dhule substation in Maharashtra.

Details:

- The project will meet the substation's auxiliary consumption requirement.
- This facility will also act as a test bed for augmenting IndiGrid's capabilities to participate in energy transition opportunities in solar and BESS space.

About IndiGrid:

- IndiGrid is the first infrastructure investment trust in the Indian power sector.
- It owns 17 power projects, consisting of 46 transmission lines with more than 8,416 ckms (circuit kilometers) length, 13 substations with 17,550 MVA transformation capacity and 100 MW (AC) of solar generation capacity.
- IndiGrid has assets under management (AUM) of over Rs 22,700 crore (USD 2.7 billion). The investment manager of IndiGrid is wholly owned by KKR.

CABINET APPROVES INDIAN SPACE POLICY 2023

**Why in news?**

- Recently, the Central government approved the Indian Space Policy 2023. The Indian Space Policy was approved by the Cabinet Committee on Security.

Key Highlights:

- The policy seeks to institutionalise private sector participation in the space sector.
- The policy will allow the private sector to take part in end-to-end space activities that include building satellites, rockets and launch vehicles, data collection and dissemination.
- The entry of the private sector in the space sector would enable the ISRO to channelise its focus on research and development of advanced space technologies.

Framework:

- The policy also delineated the roles and responsibilities of ISRO, space sector PSU NewSpace India Limited (NSIL) and the Indian National Space Promotion and Authorization Center (IN-SPaCe).
- The strategic activities related to the space sector will be carried out by NSIL, a public sector undertaking

under the Department of Space, which will work in a demand-driven mode.

- The INSPACE, created recently, will be the interface between Indian Space Research Organisation and non-governmental entities.
- The policy also spells out the framework for the private sector to use ISRO facilities for a small charge and also encourages them to invest in creating new infrastructure for the sector.
- ISRO will not do any operational and production work for the space sector and focus its energies on developing new technologies, new systems and research and development.

Way Forward:

- It will pave the way forward with much-required clarity in space reforms and augment private industry participation to drive the space economy opportunity for the country.

IN PURSUIT OF A MAGIC NUMBER, PHYSICISTS DISCOVER NEW URANIUM ISOTOPE

**Why in news?**

- While studying the atoms of heavy elements, physicists in Japan discovered a previously unknown isotope of uranium, with atomic number 92 and mass number 241, i.e. uranium-241.
- The finding refines understanding of nuclear physics. What shapes the large nuclei of heavy elements take and how often (or rarely) defines the boundaries of models that physicists use to design nuclear power plants and models of exploding stars.

New discovery:

- The discovery of a new neutron-rich uranium isotope is the first since 1979.
- The arrangement of protons and neutrons in an atomic nucleus follows some rules. In general, an atom's mass is slightly lower than the sum of the masses of protons, neutrons, and electrons.
- So, systematically measuring the mass of uranium and its neighbourhood elements yields essential nuclear information to understand the synthesis of such heavy elements in explosive astronomical events.

U-241:

- The researchers accelerated uranium-238 nuclei into plutonium-198 nuclei at the KEK Isotope Separation System.
- The resulting nuclear fragments contained different isotopes. This is how they identified uranium-241 and measured the mass of its nucleus.
- Theoretical calculations suggest it has a half-life of 40 minutes.
- The team used time-of-flight mass spectrometry to estimate the mass of each nucleus depending on the time it took to reach a detector.

Way Forward:

- There is particular interest in 'magic number' nuclei: containing a number of protons or neutrons such that the resulting nucleus is highly stable. The heaviest known 'magic' nucleus is lead (82 protons). Physicists have been trying to find the next such element.

CHINA PLANS TO BUILD LUNAR BASE USING MOON SOIL BY THIS DECADE

**Why in news?**

- After successfully returning samples from the surface of the Moon, China has plans for longer missions on the lunar surface with its taikonauts entering into lunar orbit.
- The country wants to build a lunar base using soil from the moon in the next five years.

'Chinese Super Masons':

- China previously retrieved soil samples from the near side of the moon with its Chang'e-5 mission in 2020, state media reported.
- Engineers have already designed a robot that will make bricks out of lunar soil to ready the infrastructure.
- Dubbed 'Chinese Super Masons,' the robot tasked with making the lunar soil brick will be launched during China's Chang'e-8 mission around 2028.

Lunar research base:

- China has already signed an agreement with Russia to build a research base on the Moon as more and more countries push for exploring the lunar surface.

- The stations will first operate autonomously before they are habituated by crewed missions in the future. The construction of the lunar base will begin as early as 2025.
- While engineers are undecided on the final location of the lunar base, initial studies put the Amundsen crater on the South Pole as a potential site.
- The location runs parallel to the US Artemis mission, which is also targeting the lunar south pole for its return to the Moon.

WHAT IS SOLID-FUEL TECHNOLOGY, AND WHY IS NORTH KOREA EAGER TO DEVELOP IT?

**Why in news?**

- North Korea says it has tested a new solid-fuel intercontinental ballistic missile (ICBM), its first known use of the propellant in a longer-range projectile, as it seeks the capability to launch with little preparation.

What is Solid-Fuel Technology?

- Solid propellants are a mixture of fuel and oxidiser. Metallic powders such as aluminium often serve as the fuel, and ammonium perchlorate, which is the salt of perchloric acid and ammonia, is the most common oxidiser.
- The fuel and oxidiser are bound together by a hard rubbery material and packed into a metal casing.
- When solid propellant burns, oxygen from the ammonium perchlorate combines with aluminium to generate enormous amounts of energy and temperatures of more than 5,000 degrees Fahrenheit (2,760 degrees Celsius), creating thrust and lifting the missile from the launch pad.

Who has that Technology?

- Solid fuel dates back to fireworks developed by the Chinese centuries ago, but made dramatic progress in the mid-20th century, when the U.S. developed more powerful propellants.
- The Soviet Union fielded its first solid-fuel ICBM, the RT-2, in the early 1970s, followed by France's development of its S3, also known as SSBS, a medium-range ballistic missile.
- China started testing solid-fuel ICBMs in the late 1990s.

⇒ South Korea had already secured "efficient and advanced" solid-propellant ballistic missile technology.

Solid vs. Liquid:

- ⇒ Liquid propellants provide greater propulsive thrust and power, but require more complex technology and extra weight.
- ⇒ Solid fuel is dense and burns quite quickly, generating thrust over a short time. Solid fuel can remain in storage for an extended period without degrading or breaking down, a common issue with liquid fuel.
- ⇒ The solid-fuel missiles are easier and safer to operate, and require less logistical support, making them harder to detect and more survivable than liquid-fuel weapons.
- ⇒ Any country that operates large scale, missile-based nuclear forces would seek solid-propellant missiles, which do not need to be fuelled immediately ahead of launch.

What's next?

- ⇒ North Korea said the development of its new solid-fuel ICBM, the Hwasong-18, would "radically promote" its nuclear counterattack capability.
- ⇒ Although the Hwasong-18 might not be a "game changer", it will most likely complicate the calculations of the United States and its allies during a conflict.
- ⇒ The most important interest the United States and its allies have is to reduce the risks of nuclear use and escalation stemming from North Korea's possession of these weapons.

DST INSTITUTE TO PARTNER INDIAN NAVY IN DEVELOPING SECURE MARITIME COMMUNICATIONS USING QUANTUM TECHNOLOGY



Why in news?

- ⇒ Quantum technologies will soon be used to develop secure maritime communications in a joint effort by the Raman Research Institute (RRI) and the Indian Navy.

Key Highlights:

- ⇒ RRI, an autonomous institute of the Department of Science and Technology (DST), inked a Memorandum

of Understanding (MoU) with the Weapons and Electronics Systems Engineering Establishment (WESEE), the R&D establishment of the Indian Navy.

- ⇒ Under this agreement, RRI's Quantum Information and Computing (QuIC) lab will lead the research efforts towards developing quantum key distribution techniques that the Indian Navy could leverage in the nation's efforts towards securing free space communications.

QuIC lab:

- ⇒ This lab has been leading the country's research in the field of secure quantum communication.
- ⇒ Some of its major achievements include the development of an end-to-end simulation toolkit named "qkdSim", ensuring safety in communication platforms, establishing secure communication between two buildings, and, more recently, between a stationary source and a mobile receiver.
- ⇒ QuIC lab also happens to be India's first laboratory to propose and implement a wide range of applications using single and entangled photons, particularly towards establishing secure communications in strategic areas like banking, defence, and cyber security.

NISAR SATELLITE TO MAP HIMALAYAS' SEISMIC ZONES



Why in news?

- ⇒ A forthcoming satellite NISAR, will map the most earthquake-prone regions in the Himalayas with unprecedented regularity.
- ⇒ NISAR satellite was jointly developed by the Indian Space Research Organisation (ISRO) and the National Aeronautics and Space Administration (NASA) of the U.S.
- ⇒ The data this will generate can potentially give advance warning of land subsidence, as recently observed in Joshimath, Uttarakhand, as well point to places that are at greatest risk from earthquakes.

Frequency bands:

- ⇒ The NISAR satellite, expected to cost approximately \$900 million (with ISRO contributing about one-tenth) will use two frequency bands: the L-band and S-band

- to image the seismically active Himalayan region that will, every 12 days, create a "deformation map".
- While NASA has provided the L-band radar, GPS, a high-capacity solid-state recorder to store data, and a payload data subsystem, ISRO (Indian Space Research Organisation) has provided the S-band radar, the Geosynchronous Satellite Launch Vehicle (GSLV) launch system and spacecraft.
 - S band radars operate on a wavelength of 8-15 cm and a frequency of 2-4 GHz. Because of the wavelength and frequency, they are not easily attenuated. This makes them useful for near and far range weather observation.

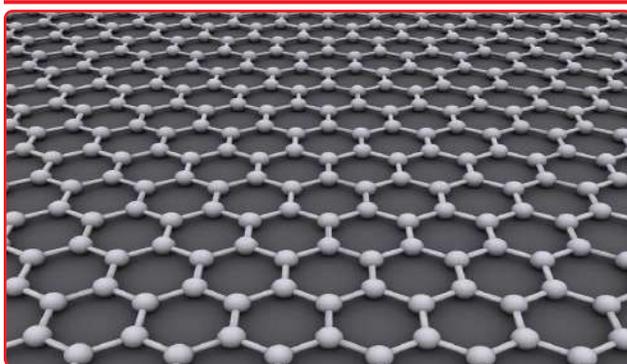
Why NISAR will be used in earthquake-prone regions?

- As per India's seismic zoning map, the total area is classified into four seismic zones: V, IV, III & II. Zone V is seismically the most active region, while zone II is the least.
- To address that, National Centre for Seismology is undertaking a microzonation exercise. which was already completed for major metros like Delhi and Kolkata.
- This mapping identifies earthquake zones at a more granular level which can help people build structures accordingly.
- The satellites can track small changes in plate tectonics and identify areas where the strain is building up for a potential earthquake.
- Satellite imagery can also help identify where groundwater depletion is causing land subsidence, such an instance was identified recently in an area of Chandigarh. Such an exercise would become more easily possible NISAR spacecraft that will be able to update plate deformation data every 12 days.

Way Forward:

- It is expected to be launched in January 2024 from Satish Dhawan Space Centre into a near-polar orbit.

MAGNETORESISTANCE: ONE MORE THING GRAPHENE DOES DIFFERENTLY



Why in new?

- Researchers in the U.K., led by Nobel laureate Andre Geim, have discovered another property of graphene.

- They found that graphene displays an anomalous giant magnetoresistance (GMR) at room temperature.

Details:

- GMR is the result of the electrical resistance of a conductor being affected by magnetic fields in adjacent materials.
- It is used in hard disk drives and magnetoresistive RAM in computers, biosensors, automotive sensors, and medical imagers.

Graphene-based device:

- GMR-based devices are particularly used to sense magnetic fields. The new study has found that a graphene-based device, unlike conventional counterparts, would not need to be cooled to a very low temperature to sense these fields.
- A conductor is sandwiched between two ferromagnetic materials (metals attracted to magnets, such as iron). When the materials are magnetised in the same direction, the electrical resistance in the conductor is low. When the directions are opposite to each other, the resistance increases. This is known as GMR.
- The magnetoresistance observed in the graphene-based device was "almost 100-times higher than that observed in other known semimetals in this magnetic field range".
- The effect is due to the way electrons in the conductor scatter off electrons in the ferromagnets, depending on the orientation of the latter's spin which is affected by the direction of the magnetic field.
- Conventional GMR devices are cooled to low temperatures to suppress the kinetic energy of their constituent particles, keeping them from deflecting the electrons moving past them. In graphene, the researchers found this suppression unnecessary.

Neutral plasma:

- In their study, the magnetoresistance in monolayer graphene at 27° Celsius held between two layers of boron nitride increased by 110% under a field of 0.1 tesla.
- To compare, the magnetoresistance in these conditions increases by less than 1% in normal metals. They attributed this to the presence of a 'neutral' plasma and the electrons' mobility.
- A graphene-based GMR device cannot replace existing devices because the latter have other properties that the former does not.
- For example, as magnetic fields are applied and removed, the conductor's resistivity in the two types of devices evolves differently.

ISRO TO LAUNCH SINGAPORE'S 750-KG SATELLITE WITH PSLVC-55 MISSION

Why in news?

- The Indian Space Research Organisation (ISRO) is gearing up for its next big mission to launch a

customer satellite in an orbit around the planet.

- The TeLEOS-2 mission will launch onboard ISRO's workhorse Polar Satellite Launch Vehicle (PSLV) on its 55th mission to date.



Details:

- The Singaporean probe is an Earth Observation Satellite, which has been designed to capture round-the-clock, all-weather satellite imagery.
- The 750-kilogram satellite, developed by ST Engineering, will provide imagery that could be used for hotspot monitoring and haze management, air crash search and rescue operations, and much more.

What is PSLV?

- The PSLV is a third-generation launch vehicle developed solely in India and was the first launched from India to be equipped with liquid stages.
- The rocket is capable of placing multiple payloads into orbit and has been used to launch various satellites into Geosynchronous and Geostationary orbits.
- During its last mission, PSLV deployed an Earth Observation Satellite (EOS-06) and eight nano-satellites with a lift-off mass of 321 tonnes into orbit.
- The Primary satellite (EOS-06) was separated in Orbit-1. Subsequently, orbit change was conducted using two Orbit Change Thrusters (OCTs) introduced in the Propulsion Bay Ring of the PSLV-C54 Vehicle.
- The XL variant of PSLV, which will be used during the C-55 mission, has 6 solid rocket strap-on motors to augment the thrust.
- The rocket is capable of launching 1,750 kg of payload to Sun-Synchronous Polar Orbits at 600 km altitude and 1,425 kg into Geosynchronous and Geostationary orbits.

PSLVC-53:

- This is not the first launch of a Singaporean satellite from India. The Indian space agency launched three Singaporean satellites with the PSLVC-53 mission in June 2022.
- The spacecraft carried the DS-EO satellite, NeuSAR, a 155 kg satellite, and Scoob-1 of Nanyang Technological University (NTU), Singapore.
- The DS-EO satellite carried an Electro-Optic, multi-spectral payload with 0.5 m resolution imaging capability.

- Meanwhile, the SCOOb-I was the first satellite in the Student Satellite Series (S3-I), a hands-on student training program from the Satellite Research Centre (SaRC) at Singapore's NTU School of Electrical and Electronic Engineering.

What's next?

- The PSLV C-55 mission is scheduled to launch from the Satish Dhawan Space Center in Sriharikota on April 22.

INDIAN SCIENTISTS IDENTIFY NEW WAVE IN ANTARCTICA THAT COULD ENHANCE SAFETY OF SATELLITES



Why in news?

- Indian scientists have identified a unique form of plasma wave at Maitri, the Indian Antarctic station, which plays a key role in the radiation belt of Earth.
- The analysis of the wave could further help in safeguarding Indian assets in Low Earth Orbit.

EMIC waves:

- The Electromagnetic Ion Cyclotron waves identified in Antarctica play an important role in the precipitation of killer electrons, which have speed close to the speed of light.
- The waves are formed when low-energy ions in the magnetosphere interact with electromagnetic fields, causing the ions to spiral along the magnetic field lines.
- Found in the magnetosphere, EMIC waves accelerate electrons to very high energies and can cause the particles in the radiation belts to scatter, accelerate, and precipitate into the Earth's atmosphere, which can lead to changes in the distribution and intensity of the radiation belts.

Key Highlights:

- The study of plasma waves provides with information on regions inaccessible, transport mass and energy across different regions, how they interact with charged particles, and control the overall dynamics of the Earth's magnetosphere.
- Scientists from the Indian Institute of Geomagnetism (IIG) collected data between 2011 and 2017 using the

Induction Coil Magnetometer, installed at the Indian Antarctic station Maitri to bring out several aspects of the ground observation of the EMIC waves.

- They found the location of the generation of the waves in space and also suggested that the lower-frequency waves modulate the higher-frequency waves.
- The study showed that the short-period modulation of such wave events is common and dependent on EMIC wave frequency.

Way Forward:

- Understanding the behavior of EMIC waves is important for predicting and mitigating the effects of space weather on satellites and other spacecraft in the near-Earth environment.

CM PATNAIK LAUNCHES HEAVY LIFT LOGISTICS DRONE IN ODISHA SKILL CONCLAVE



Why in news?

- Recently, Odisha Chief Minister launched first of its kind heavy lift logistics drone (can transport 50kg over 10kms) made by Odisha-based start-up BonV Aero on the opening day of "Odisha Skill Conclave 2023".

BonV Aero:

- BonV Aero is an IIT Mandi, AIC CV Raman Global University Odisha and NITI Aayog-backed venture building Electric Aerial Vehicles for Cargo transportation.

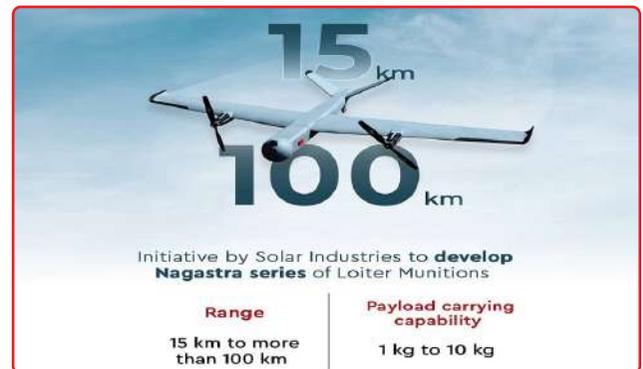
Capability of RM001 & RM002:

- Start-up has successfully done a trial of this 'RM001' Electric Aerial Vehicle carrying 50-kilogram cargo at the altitude of 8000 to 10,000 feet in the Tawang of Eastern Command of the Indian Army forward post in Arunachal Pradesh and next a high altitude trial on 14,000 to 16,000 feet will be done.
- In its next phase, the startup aims to develop its flagship platform 'RM002' that can transport 200 kilograms of freight over 40 kilometres.
- These multi-utility Air vehicles are beneficial in the disaster response and the movement of any kind of cargo/ goods where surface logistics are either unfavourable or time-consuming consuming.

Significance:

- Odisha is highly disaster-prone see the Cyclone and Flood on regular bases, it can be useful in that situation, it is also many times cheaper the current alternatives, so it will help to improve accessibility and efficiency of logistics solutions, especially in the remote and Hilly terrains.

SOLAR INDUSTRIES TO SUPPLY UAV 'NAGASTRA' TO INDIAN ARMY



Why in news?

- Solar Industries Nagpur has bagged an order to supply unmanned aerial vehicle (UAV) 'Nagastra' to the Indian Army, beating competitors from Israel and Poland.

Details:

- With government's initiative to bring Atmanirbharta in ammunition and defence systems, the first indigenous Loiter Munition (LM), Nagastra, has been designed and developed by Economics Explosives Ltd (EEL), a 100 per cent subsidiary of Solar Industries Nagpur, in association with Z-Motion, Bangalore.
- A model of 'Nagastra -1' loitering munition was recently displayed in the Army Commanders conference held in New Delhi.

Nagastra -1:

- Nagastra -1 having an indigenous content of more than 75 per cent has many world class features.
- In a 'Kamikaze mode' it can neutralise any hostile threat with GPS enabled precision strike with an accuracy of 2 m. The fixed wing electric UAV has an endurance of 60 min with a man-in-loop range of 15 km and autonomous mode range of 30 km.
- In addition to day-night surveillance cameras the loiter munition is equipped with fragmenting warhead to defeat soft-skin targets.
- In case a target is not detected or if the mission is aborted, the loiter munition can be called back and made a soft landing with a parachute recovery mechanism enabling it to be reused multiple times.
- Abort, recover and reuse features of this loiter munition make this system superior to similar class of systems developed by advanced countries.

Significance:

- Drone technology has proved to be a force multiplier in military operations as evident from its application in various recent conflicts across the world, especially in cases of Armenia-Azerbaijan, Syria, strike on oilfields in Saudi Arabia, and the ongoing Russia-Ukraine conflict.
- Even in Indian context, the recent incidents along the borders have seen a noticeable increase in drone related incidents along the northern borders.

Way Forward:

- Solar Industries have taken initiatives to develop a wide array of weaponised drones to neutralise various targets using gravity drop bombs, guided missiles or using them in a Kamikaze mode.
- This will go a long way to boost indigenous capability of using drones/ UAVs as war machinery.

WHAT IS LOCKBIT RANSOMWARE AND HOW IS IT SPECIFICALLY TARGETING APPLE COMPUTERS?

**Why in news?**

- Recently, reports emerged that LockBit ransomware was found to be targeting Mac devices.

Details:

- Cybercriminals have developed new ransomware encryptors designed to target macOS devices, making this the first major ransomware operation to specifically target Apple computers.
- The same gang was also reportedly behind a cyber-attack on U.K. postal services in 2023, causing international shipping to grind to a halt.

What is LockBit ransomware?

- First reported in September 2019 and dubbed the "abcd" virus, due to the file extension used when encrypting victim's files, the LockBit ransomware is designed to infiltrate victims' systems and encrypt important files.
- The virus is categorised as a "crypto virus" due to its requests for payment in cryptocurrency to decrypt files on the victim's device.
- The gang behind the LockBit ransomware reportedly maintains a dark web portal to recruit members

and release data of victims who refuse to meet their demands, as part of their business model.

- In the past, LockBit ransomware has been used to target enterprises and organisations in the U.S., China, India, Ukraine, and Indonesia. Attacks have also been recorded throughout Europe, including France, Germany, and the U.K.

Why is LockBit targeting macOS?

- Historically, ransomware has targeted Windows, Linux, and VMware ESXi servers. However, LockBit is now working to create encryptors targeting Macs for the first time.
- After launching multiple attacks across Europe and Asia, the gang is developing tools to target macOS and further increase the scope of attacks to bring in more financial gains for the operation.

How does LockBit ransomware work?

- It works as a self-spreading malware, not requiring additional instructions once it has successfully infiltrated a single device with access to an organisational intranet.
- It is also known to hide executable encryption files by disguising them in the .png format, thereby avoiding detection by system defences.
- Attackers use phishing tactics and other social engineering methods to impersonate trusted personnel or authorities to lure victims into sharing credentials.
- Sometimes, the ransomware has also used brute force to gain access to the intranet server and network of an organisation.
- Once it has gained access, the ransomware prepares the system to release its encryption payload across as many devices as possible. It then disables security programs and other infrastructures that could permit system data recovery. The goal is to ensure that data recovery without assistance from the LockBit gang is impossible.

Who is behind the ransomware?

- The group behind this is known as the LockBit gang. It is considered the most prolific ransomware group ever.
- It operates on the ransomware-as-a-service (Raas) model and comes from a line of extortion cyberattacks. In this model, willing parties put down a deposit for use in a custom attack and make profits through the ransom payment.
- The ransom is divided between the LockBit developer team and attacking affiliates, who receive up to three-fourths of the ransom.

How do we protect systems against the LockBit ransomware?

- While there are no fool-proof ways of protecting against ransomware attacks, organisations and individuals can take certain steps to increase resilience against such cyber threats.

- The use of strong passwords, with strong variations of special characters which are not easy to guess along with multi-factor authentication should be implemented. This ensures the use of brute force will not be enough to compromise systems.
- Organisations can also undertake training exercises to educate employees on the use of phishing attacks and their identification. Old and unused user accounts should be deactivated and closed as they can become weak links in the security apparatus.
- Additionally, organisations and individuals should have an understanding of cybersecurity threats and vulnerable points that may be exploited by cybercriminals.

HEALTH

AZERBAIJAN, TAJIKISTAN REACHES MALARIA-FREE MILESTONE



Why in news?

- Recently, the World Health Organization (WHO) has certified Azerbaijan and Tajikistan as malaria-free for eliminating the Anopheles mosquito-borne disease in their territories.

Details:

- In Tajikistan and Azerbaijan, the last cases of regional spread of Plasmodium vivax malaria were discovered in 2012 and 2014, respectively.
- With the latest announcement, the WHO officially declared 41 countries and one territory, including 21 countries in the European Region, malaria-free.

Criteria:

- The declaration came after an extensive, century-long campaign by the two nations to eradicate the disease.
- The WHO certifies a country as malaria-free, typically when the latter can provide evidence showing the malaria transmission cycle has been broken for at least the last three years.
- Despite providing rigorous, credible evidence, a country must also demonstrate its capacity to prevent the re-establishment of transmission.

Strategies adopted by both nations:

- Through a variety of investments and public health initiatives, the governments of Azerbaijan and Tajikistan were better able to manage malaria over time. The countries have provided everyone with free basic healthcare for over 60 years, according to WHO.
- They have actively backed targeted malaria interventions, such as spraying insecticides on interior walls of homes to prevent the disease, encouraging early diagnosis and treatment of all cases, and maintaining the abilities of all health professionals working to eradicate the disease.
- Both Azerbaijan and Tajikistan use national electronic malaria monitoring systems to establish whether an infection is indigenous or imported and provide real-time case data
- They also employed biological larval control strategies, like mosquito-eating fish and water management practices to lessen malaria carriers.

About Malaria:

- Malaria is a life-threatening mosquito borne blood disease caused by plasmodium parasites.
- It is predominantly found in the tropical and subtropical areas of Africa, South America as well as Asia.
- It is preventable as well as curable.

Spread:

- The parasites spread through the bites of infected female Anopheles mosquitoes.
- After entering the human body, parasites initially multiply within the liver cells and then attack the Red Blood Cells (RBCs) resulting in their rupture.

INDIA HAS REGISTERED A GLOBAL FIRST OF A PLANT FUNGUS INFECTING HUMANS



Why in news?

- The first case of a plant fungus called Chondrostereum purpureum infecting human beings has been reported from Kolkata.
- A 61-year-old man suffering from a hoarse voice, cough, fatigue and difficulties swallowing was hospitalised and was detected as having been infected by the fungal species Chondrostereum purpureum.

- ⇒ This is worrisome and may be the first instance of a new danger that the human race may face in near future.

Chondrostereum purpureum:

- ⇒ The fungus, Chondrostereum purpureum, is known to cause Silver leaf disease in plants, especially in species of rose families. However, there were no reported instances of this fungus infecting human beings from any part of the world.
- ⇒ Of the hundreds of millions of fungal species, only a few cause infections in humans. This may be the start of a new phenomenon when plant fungus is adapting to invade human cells by evading the process of 'phagocytosis'.
- ⇒ The process, which means 'cell eating', happens when a cell uses its plasma membrane to engulf a large particle, giving rise to an internal compartment called the 'phagosome'. Organisms clean and defend themselves by this process.

Vulnerable:

- ⇒ Human beings with a compromised immune system are most vulnerable to fungal infection.
- ⇒ In 2021, many people in India who had developed COVID-19 contracted a secondary fungal infection from black fungus, resulting in over 4,500 deaths.

How fungi can invade humans?

- ⇒ Rising temperature due to global warming is thought of as one of the major reasons for this new threat to human beings. Most fungi thrive in the range of 12°C to 30°C. However, many species are thermotolerant and can withstand high temperatures.
- ⇒ In order to invade human cells, fungi, on one hand, have to be able to evade the phagocytosis pathway and, on the other hand, should have the ability to grow at 35-37 °C temperature. Global warming could have a significant effect on fungal populations.

Role of global warming:

- ⇒ Global warming can change the distribution of heat-tolerant and susceptible species by favouring those that are more thermotolerant.
- ⇒ This will facilitate fungi to spread and enter into closer contact with human populations and a few of those having pathogenic potential can acquire the ability to survive at body temperatures.
- ⇒ This threat is magnified as some fungi can take the benefit of a natural selection-adaptation strategy, and therefore adapt to a higher temperature by thermal selection.
- ⇒ Global warming means the narrowing of the thermal difference between the human body and its surroundings. Every degree increase in the global average temperature reduces this gradient by about five per cent. This increases the chance of the prevalence of fungal diseases.

Conclusion:

- ⇒ Fungal infections are expected to pose a greater threat to human beings in the years to come due to rising temperatures, caused by climate change and other reasons such as growing resistance to the small number of treatments available.

GHANA FIRST TO APPROVE OXFORD'S MALARIA VACCINE FOR CHILDREN



Why in news?

- ⇒ Recently, a malaria vaccine developed by Oxford University has received its first approval in Ghana as it intensifies its fight against the disease that claims a child's life every minute.
- ⇒ The initiative is one of many aimed at combating the mosquito-borne disease that kills more than 600,000 people annually, mostly children in Africa.

Oxford's R21 vaccine:

- ⇒ The vaccine has been approved for use in children aged 5-36 months, the age group at highest risk of death from malaria.
- ⇒ Malaria vaccine development has long been hampered by the parasite's complex structure and lifecycle.
- ⇒ Oxford's R21 vaccine was up to 80 per cent successful in clinical trials conducted in Burkina Faso when administered in three initial doses followed by a booster shot a year later.

Concerns:

- ⇒ It is being considered for approval by the World Health Organization.
- ⇒ Vaccines for children in Africa are usually contributed by international organisations such as UNICEF after being supported by the World Health Organization (WHO).
- ⇒ It is unusual that a regulatory authority in Africa had reviewed the data quicker than the WHO.
- ⇒ Ghana has a stable, well-functioning, and integrated regulatory system, according to an external benchmarking conducted by the World Health Organization in 2020.
- ⇒ Also, it is still uncertain if R21 is good value for money, especially when compared to other cost-

effective malaria interventions that have not been fully deployed across endemic countries, such as insecticide-treated nets or indoor residual spraying.

Vaccine by GSK:

- A separate vaccine developed by British pharmaceutical firm GSK plc was the first to be recommended by WHO for general use against malaria in 2022. It has since been given to more than a million children in Africa.
- However, studies have shown that after receiving a booster dosage, the vaccine from GSK only has a 60 per cent efficacy rate. Further, the company's ability to manufacture the required number of doses has been hindered by a lack of money and economic potential.

Way Forward:

- The Oxford vaccine has an edge in manufacturing owing to its agreement with the Serum Institute of India to develop up to 200 million doses yearly.
- In contrast, GSK has committed to producing up to 15 million doses annually through 2028, far less than the estimated 100 million doses a year.

ANIMAL PANDEMIC PREPAREDNESS INITIATIVES AND WORLD BANK-FUNDED ANIMAL HEALTH SYSTEM SUPPORT FOR ONE HEALTH LAUNCHED

Why in news?

- Recently, the Union Minister for Fisheries, Animal Husbandry and Dairying launched the Animal Pandemic Preparedness Initiative and World Bank-funded Animal Health System Support for One Health to enhance India's preparedness and response to potential animal pandemics, in line with the One Health approach.



Aim:

- This initiative aims to enhance India's preparedness and response to animal pandemics, with a focus on zoonotic diseases that pose a threat to both animal and human health.
- This initiative will help to improve veterinary services and infrastructure, disease surveillance capabilities, early detection and response, build the capacity of

animal health professionals, and awareness among farmers through community outreach.

AHSSOH:

- The event also saw the launch of the World Bank-funded project on "Animal Health System Support for One Health (AHSSOH)" that aims at creating an ecosystem for a better animal health management system using the One Health approach covering five (05) states in India.

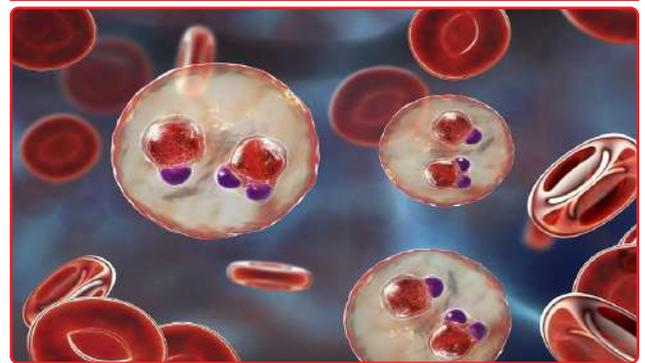
Animal Pandemic Preparedness Initiative (APPI):

- Animal Pandemic Preparedness Initiative is an initiative to cover all aspects of disease prevention, control and pandemic preparedness comprehensively.
- The key elements include Integrated disease surveillance & monitoring, early warning & response, Vaccine/ diagnostics, R&D and production, and ecosystem coordination with funding and regulatory framework enablers.

Implementation:

- The Department of Animal Husbandry and Dairying, (DAHD), Government of India is committed to the successful implementation of the Animal Pandemic Preparedness Initiative and the World Bank-funded Animal Health System Support for One Health and looks forward to working with all stakeholders towards this important goal.

JNU RESEARCHERS FIND NOVEL WAY TO STOP FATAL MALARIA TRANSMISSION



Why in news?

- Researchers at the Jawaharlal Nehru University (JNU) have found a new way to block the transmission of fatal malaria parasites.
- They found a new compound that showed potent transmission-blocking activity.

Details:

- JNU researchers have identified a novel cold shock protein of Plasmodium falciparum, which plays an essential role in the sexual and asexual development of malaria parasites.
- Since the malaria parasite experiences low-temperature stress in mosquitoes, this protein provides a protective covering to the parasite against cold conditions.

Malaria:

- The mosquito-borne disease, malaria, is caused by a parasite, which grows and multiplies first in the liver cells and then in the red cells of the blood.
- The parasite grows in the red blood cells, multiplying and further invading.
- Four kinds of malaria parasites infect humans: Plasmodium falciparum, P. vivax, P. ovale, and P. malariae.

Cold shock proteins:

- To combat the adverse effects of low temperatures, cold shock proteins are expressed in bacteria, plants, and humans that play a crucial role in acquiring cold tolerance.
- Cold shock proteins are known to destabilize secondary structures in target RNA which in turn allow efficient transcription and translation.
- Scientists have now proposed that targeting this essential Plasmodium cold shock protein with LI71 can block the growth and transmission of malaria parasites.

Outcome of research:

- They have achieved a significant milestone in the development of a transmission-blocking anti-malarial agent.
- Plasmodium falciparum PfCoSP (PfCoSP) is a cold shock protein of the malaria parasite that was found to play a pivotal role in adapting the parasite to cold stress conditions inside the mosquito host. Blocking this protein by LI71 would thus break the transmission cycle among mosquitoes.

Way Forward:

- Research is ongoing in enhancing anti-malarial drugs as the parasite has developed coping mechanisms against it. Resistance to currently available anti-malarial drugs urge additional drug lead identification efforts and further research into this deadly disease.
- They hope that their new work could pave way for targetting drug-resistant parasites.

WORLD CHAGAS DISEASE DAY 2023**Why in news?**

- Recently, the World Health Organization (WHO) observed World Chagas Disease Day April 14, 2023

to raise awareness about this little-known disease that affects millions every year, especially the poor population and people in Latin America.

Background:

- In 2019, the 72nd World Health Assembly dedicated this day to the disease. This year's theme is "time to integrate Chagas disease into primary health care".

What is Chagas disease?

- Chagas disease, also called American trypanosomiasis, is a communicable parasitic disease that has infected 6-7 million people and claims around 12,000 lives every year across the globe.
- The systemic, chronic disease manifests as fever, headaches, rashes and inflammatory nodules, nausea or diarrhoea and muscle or abdominal pain.
- A majority of the patients (70-80 per cent) show an asymptomatic clinical course throughout their lives, making early detection challenging. It is often referred to as the "silent and silenced disease".
- Around 20-30 per cent infections evolve into the chronic stage, during which patients show symptoms indicating damage to tissues of heart, digestive system or nervous system.

Transmission:

- It is caused by the parasite protozoan Trypanosoma cruzi. The parasites are mainly transmitted by a family of bugs called 'triatomines', also known as the 'kissing bug'.
- These blood-sucking bugs transmit the disease from infected to healthy individuals through bites and by defecating on them.
- An individual can also contract this disease through congenital transmission (pregnant woman to their baby), blood transfusions, organ transplantation, consumption of uncooked food contaminated with faecal matter of infected bugs or even accidental laboratory exposure. The disease, however, cannot propagate by casual contact with infected humans or animals.

Prevalence:

- The disease is named after physician Carlos Chagas who first detected it in a Brazilian child in 1909. Since then, the disease remains most prevalent in Latin America, with the poor facing the highest risk.
- The most important vectors are found in the rural parts of Argentina, Bolivia, Brazil, Chile, Paraguay, Uruguay, Peru, Colombia, Venezuela, Ecuador, Panama, and Central America.
- Chagas is currently endemic in 21 countries in the Americas, and shows an annual average incidence of 30,000 new cases.

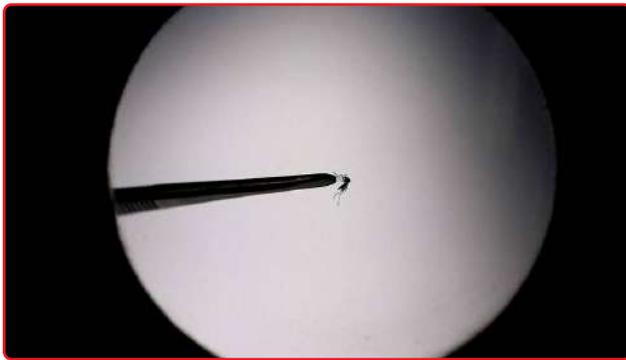
Vaccination & Prevention measures:

- There are currently no vaccines available for Chagas disease. However, the disease can be treated with

antiparasitic medicines Benznidazole and Nifurtimox. These have a 100 per cent efficacy rate if the medicine is administered at the onset of the acute stage.

- Preventive measures have been put in place by countries to eliminate the bugs or reduce infections.
- Governments have employed spraying insecticides as a measure to eliminate triatomine bugs in parts of Mexico, Central and South America.
- Universal screening of blood donors and blood products is done by all Latin American countries, and other countries reporting new cases.

ARGENTINA BATTLES MAJOR DENGUE OUTBREAK WITH ATOMIC RADIATION



Why in news?

- Argentine, fighting one of its worst outbreaks of dengue in recent years, is sterilizing mosquitoes using radiation that alters their DNA before releasing them into the wild.
- It has recorded over 41,000 cases of the disease transmitted by mosquitoes, far above the equivalent level in previous years of major outbreaks in 2020 and 2016.

Key Highlights:

- To fight back, National Atomic Energy Commission (CNEA) biologists have been experimenting with atomic sterilization since 2016.
- They are sterilizing 10,000 males per week and aim to increase that to 500,000. They expect to release the first batch of sterilized males in November.
- They are sterilized through ionizing energy and those sterile males are freed into the fields and when they meet with a wild female, their offspring are not viable.

Dengue:

- Dengue is transmitted through the bites of aedes aegypti mosquitoes. Its symptoms include fever, eye, head, muscle and joint pain, nausea, vomiting and fatigue.

Background:

- Similar techniques to sterilize pests using the same radiation found in X-rays have been utilised for decades, helping global efforts to control diseases such as chikungunya, dengue and Zika.

SOCIAL ISSUE

MALAYSIA ENDS MANDATORY DEATH PENALTY FOR SERIOUS CRIMES

THE STATE OF THE DEATH PENALTY IN MALAYSIA



Why in news?

- Recently, Malaysia's Parliament passed sweeping legal reforms to remove the mandatory death penalty, trim the number of offences punishable by death, and abolish natural-life prison sentences.

Background:

- Malaysia's move comes even as some Southeast Asian neighbours have stepped up use of capital punishment, with Singapore in 2022 executing 11 people for drug offences and military-ruled Myanmar carrying out its first death sentences in decades against four anti-junta activists.
- Malaysia has had a moratorium on executions since 2018, when it first promised to abolish capital punishment entirely.
- The government, however, faced political pressure from some parties and rowed back on the pledge a year later, saying it would retain the death penalty but allow courts to replace it with other punishments at their discretion.

Key Highlights:

- Under the amendments passed, alternatives to the death penalty include whipping and imprisonment of between 30 to 40 years. The new jail term will replace all previous provisions that call for imprisonment for the duration of the offender's natural life.
- Life imprisonment sentences, defined by Malaysian law as a fixed term of 30 years, will be retained.
- Capital punishment will also be removed as an option for some serious crimes that do not cause death, such as discharging and trafficking of a firearm and kidnapping.

Way Forward:

- More than 1,300 people facing the death penalty or imprisonment for natural life - including those who have exhausted all other legal appeals can seek a sentencing review under the new rules.

CENTRE TOLD TO FRAME POLICY FOR MENSTRUAL HYGIENE IN SCHOOLS



Why in news?

- Recently, the Supreme Court said a “uniform national policy” may be framed by the Centre in consultation with the States and Union Territories to ensure menstrual hygiene by providing sanitary pads, vending and disposal mechanisms and exclusive washrooms for girls in schools.

Key Highlights:

- The court said the issue was in public interest and highlighted the need for sanitation and menstrual hygiene for girl children in government-aided and residential schools.
- The court was hearing a petition to direct the government to ensure provision of sanitary pads to girl students in Classes 6 to 12 and separate toilets.
- The bench said that it is appropriate if the Union of India deals with the States and Union Territories to form a uniform national policy with sufficient leeway for States and Union Territories based on prevailing conditions.

Directions by the court:

- The court gave the States and Union Territories four weeks to submit to the Union Health Secretary their menstrual hygiene plans.
- The court asked them to provide the ratio of girls' toilets in schools and the amount spent on low cost sanitary pads, and vending and disposal mechanisms in schools.

What's next?

- The court listed the case after three months by the end of July.

HOW CAN A JUVENILE BE TRIED AS AN ADULT IN COURT?

Why in news?

- The National Commission for Protection of Children (NCPCCR) has recently issued guidelines for conducting a preliminary assessment by the Juvenile Justice Board (JJB) under Section 15 of the Juvenile Justice Act, 2015 (JJ Act, 2015).

- This preliminary assessment is to ascertain whether a juvenile can be tried as an adult.
- Replacing the Juvenile Justice Act, 2000, the 2015 Act, for the first time, provided for trying juveniles in the age group of 16-18 as adults in cases of heinous offences.

How does a child get tried as adult?

- The Act has categorised the offences committed by children into three categories; petty offences, serious offences, and heinous offences.
- Section 15 of the JJ Act provides that in case of a heinous offence alleged to have been committed by a child, who has completed or is above the age of sixteen years, the Board shall conduct a preliminary assessment regarding his mental and physical capacity to commit such offence, ability to understand the consequences of the offence and the circumstances in which he allegedly committed the offence.
- Section 18 (3) of the Act further suggests that, if the Board, after preliminary assessment under section 15 passes an order that there is a need for trial of the said child as an adult, then the Board may order the transfer of the case to the Children's Court having jurisdiction to try such offences.
- Thus, the sole objective of having such a preliminary assessment is to determine whether a child within the age group of 16-18 years should be tried as an adult in case of heinous offences.

What are the responsibilities of the Board?

- The guidelines further make it clear that the JJB shall be responsible for the preliminary assessment and provide the child, the child's family, and their counsel a copy of the order.
- It further states that in case the JJB does not have at least one member who is a practising professional with a degree in child psychology or child psychiatry, the Board shall take the assistance of psychologists or experts who have the experience of working with children in difficult times.
- The child should also be provided with a legal aid counsel through the District Legal Services Authority who shall be present during the preliminary assessment.
- One of the important aspects of the guidelines is that it mandates experts, who have the required qualification to assist the JJB, to undergo training concerning Section 15 of the JJ Act, 2015
- During the preliminary assessment, the Board and experts shall also analyse and take into consideration the Social Investigation Report (SIR), to be prepared by the Probation officer or Child Welfare Officer or any social worker, or a Social Background Report (SBR) to be prepared after interaction with the child or child's family.

What next?

- The NCPCR is under a statutory obligation under Section 109 of the JJ Act, 2015 to monitor the proper implementation of the provisions of the Act.
- The guidelines have been made to remove any ambiguity and to clarify the steps that need to be followed while conducting the preliminary assessment.
- However, the major issue remains the implementation and absorption of these principles in the system, particularly to be followed by the JJB and the Children's Court.
- A lot of principles which have been made a part of the Act have not been given due prominence by the Board as well as by the Children's Court.

CULTURE**ICCR TO BUILD AMBASSADOR PROGRAMME AMONG FOREIGN STUDENTS IN INDIA****Why in news?**

- The Indian Council for Cultural Relations (ICCR) is aiming to expand the country's artistic and creative footprint globally, by tapping into the experiences of foreign students studying in India.
- It hopes that more than 48,000 foreign students in India will be brand ambassadors of the national heritage, tourist destinations, textiles, yoga, ayurveda and craft.

E-3:

- Beginning in 2023, the ICCR will start E-3 or 'exit engagement evenings' with foreign students, beginning three or four months before they finish their courses in various Central and State universities, institutes such as the National Institutes of Technology and agricultural colleges.
- The engagements will include visits to places of national importance. This "soft diplomacy" is meant to spread the India story when students go back to their home countries.
- At present, the ICCR has zeroed in on the Khadi Commission, the Indian Tourism Development Corporation and the Department of Ayush to hold these evenings with the students.

- There are plans to rope in the Tribal Cooperative Marketing Development Federation of India (TRIFED), which promotes produce and products of tribes.
- As a pilot project, the Ministry of Tourism wants to take foreign students to Parliament and the Pradhanmantri Sangrahalaya.

India Alumni Portal:

- In April 2022, the ICCR launched a website, called the India Alumni Portal, as a platform to connect with the foreign students around the world who have studied in India.
- The portal is envisaged to be a single platform for all foreign scholars to register, interact, and maintain their Indian links.

Foreign students in India:

- According to the latest All India Survey on Higher Education (AISHE) brought out by the Ministry of Education, the number of foreign students enrolled in Indian higher education institutions was 48,035 in 2020-21, a marginal dip from 49,348 in 2019-20.

PUSHKARALU FESTIVAL RETURNS TO THE GANGA AFTER A GAP OF 12 YEARS**Why in news?**

- The 12-day Pushkaralu festival celebrated by Telugus recently started in Varanasi.

Details:

- The festival, during which pilgrims worship the Ganga and their ancestors, is being organised in Varanasi after a gap of 12 years.
- It is the second event, after the Kashi-Tamil Sangamam, being organised in Varanasi which will witness a large number of South Indians visiting the city.

What is the legend behind the festival?

- As per the legends, after severe penance a devotee Pushkara was blessed by Lord Shiv with the ability to live in water and purify holy rivers.
- On the request of Guru Brihaspati (Jupiter) in view of his abilities, Pushkara decided to enter 12 sacred rivers: Ganga, Narmada, Saraswati, Yamuna, Godavari, Krishna, Kaveri, Bhima, Tapti, Tungbhadra, Sindhu and Pranhita.

- ⇒ Each river has its zodiac sign. The river for each year's festival is decided as per Brihaspati's travel from one zodiac sign to another.

MISCELLANEOUS

INDIAN-AMERICAN C.R. RAO WINS NOBEL PRIZE EQUIVALENT IN STATISTICS



Why in news?

- ⇒ Recently, the Indian-American statistician C.R. Rao has been awarded the 2023 International Prize in Statistics, the equivalent of the Nobel Prize for statistics.

Why he was chosen for the award?

- ⇒ He has influenced, in the words of the American Statistical Association, "not just statistics" but also "economics, genetics, anthropology, geology, national planning, demography, biometry and medicine".
- ⇒ The citation for his new award calls him "a professor whose work more than 75 years ago continues to exert a profound influence on science".

Achievements:

- ⇒ His groundbreaking paper, "Information and accuracy attainable in the estimation of statistical parameters", was published in 1945.
- ⇒ He did his Ph.D. in 1946-1948 at King's College, Cambridge University, under the supervision of Ronald Fisher, regarded as the father of modern statistics.
- ⇒ The 1945 paper boosted the development of modern statistics and its application in research.

Rao score test:

- ⇒ One of Professor Rao's papers in 1948 offered a novel generic approach to testing hypotheses, now widely known as the "Rao score test".
- ⇒ This and two other tests, developed by Jerzy Neyman, E.S. Pearson and Abraham Wald, are sometimes called "the holy trinity" of this branch of statistics.
- ⇒ He also contributed to orthogonal arrays, a concept in combinatorics used to design experiments whose results are qualitatively good, as early as 1949.
- ⇒ He was awarded the title of Padma Bhushan by the Indian Government (1968) and Padma Vibhushan in 2001.

About International Prize in Statistics:

- ⇒ It is awarded once every two years to an individual or team "for major achievements using statistics to advance science, technology and human welfare".
- ⇒ The prize recognises a major achievement by an individual or team in the statistics field, particularly an achievement of powerful and original ideas that have led to practical applications and breakthroughs in other disciplines.
- ⇒ The prize is modelled after the Nobel prizes, Abel Prize, Fields Medal and Turing Award.
- ⇒ The first International Prize in Statistics was awarded in 2017 to David R Cox for the development of the Cox proportional hazards model, which allows researchers to investigate patient survival rates in complex studies.
- ⇒ Bradley Efron received the award in 2019 for a statistical method known as the bootstrap, a clever computational method for assessing uncertainty in applied statistics.
- ⇒ Nan Laird received the award in 2021 for the development of powerful methods that have made possible the analysis of complex longitudinal studies

Way Forward:

- ⇒ He will receive the prize, which comes with a USD 80,000 award, in July 2023 at the biennial International Statistical Institute World Statistics Congress in Ottawa, Ontario, Canada.



PRACTICE QUESTION FOR UPSC PRELIMS EXAM

1. Consider the following statement:
 1. World Health Organization (WHO) has certified Azerbaijan and Tajikistan as malaria-free.
 2. Both Azerbaijan and Tajikistan use national electronic malaria monitoring systems.
 3. According to WHO, all the European countries are malaria free.
 Choose the correct option from the codes given below:

a) 1 and 2	b) 2 and 3
c) 1 and 3	d) 1, 2 and 3

2. Consider the following statement regarding Anganwadi:
 1. The beneficiaries are identified on the basis of BPL card.
 2. It was started as part of the Integrated Child Development Services program.
 3. It serves as a rural child and maternal care centre in India.
 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 Atal Innovation Mission (AIM):
 1. It is a flagship initiative to promote a culture of innovation and entrepreneurship in the country.
 2. Its objective is to develop new programmes and policies for fostering innovation in different sectors of the economy.
 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 Amnesty Scheme under Foreign Trade Policy 2023:
 1. This scheme is intended to provide relief to exporters who have been unable to meet their obligations under EPCG.
 2. It will give these exporters a fresh start and an opportunity to come into compliance.
 3. The interest payable is capped at 100% of these exempted duties under this scheme.
 Choose the correct option from the codes given below:

a) 1 Only	b) 2 Only
c) 1 and 2	d) None of the above

5. Consider the following statement regarding Malaria:
 1. It is a blood borne disease caused by plasmodium parasites.
 2. After entering the human body, parasites initially multiply within the liver cells and then attack the Red Blood Cells (RBCs) resulting in their rupture.
 3. The parasites spread through the bites of infected *Ades* mosquitoes.
 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. With the recent excavation of site, Pattanam, Consider the following statement:
 1. Idols of gods and goddesses
 2. Sophisticated weaponry
 3. Evidence of religious war.
 What are the things that did not emerge from Pattanam?

a) 1 and 2	b) 2 and 3
c) 1 and 3	d) 1, 2 and 3

7. Consider the following statement regarding Kala-Azar:
 1. It is transmitted to humans by the bite of an infected female anopheles mosquito.
 2. It is a vector borne disease caused by protozoan parasites of the genus *leishmania*.
 3. Bihar, Jharkhand, West Bengal and Uttar Pradesh are endemic for kala-azar in India.
 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 Vostro account:
 1. It is an account that domestic banks hold for foreign banks in the former's domestic currency.
 2. Special Rupee Vostro Accounts (SRVA) uses freely convertible currencies and works as a complimentary system.
 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 statements with respect to Wagner Group
1. It is a private Russian paramilitary unit of armed force.
 2. It is owned and financed by Yevgeny Prigozhin.
 3. The group is active only in Russia.
- Choose the correct option from the code given below:
- a) 1 and 2
 - b) 2 and 3
 - c) 1 and 3
 - d) 1, 2 and 3
122. Consider the following statements with respect to Wassenaar Arrangement:
1. All the permanent members of the UNSC are members to this organization.
 2. It is a multilateral export control regime on export controls for conventional arms and dual-use goods and technologies.
 3. India is one of the member country to this organization.
- Choose the correct option from the code 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 eShram portal:
1. It will now include the family details of migrant worker.
 2. It will also share the data of construction worker.
- 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. "Operation Kaveri" was in news. It is related to
- a) Evacuation of Indian from Ukraine.
 - b) Cleaning River Kaveri.
 - c) Settle dispute of distribution of river water between Karnataka and Tamil Nadu.
 - d) Evacuate of Indian nationals from conflict-torn Sudan.
125. Consider the following statement regarding Malaria:
1. It is caused by the bite of the female Anopheles mosquito.
 2. Plasmodium falciparum and Plasmodium vivax are responsible for maximum cases
 3. Malaria mosquitoes affects only human being.
- Choose the correct option from the code given below:
- a) 1 and 2
 - b) 2 and 3
 - c) 1 and 3
 - d) 1, 2 and 3

PRACTICE QUESTION FOR UPSC MAINS EXAM

1. The current brown-to-green transition movement in India needs policy firmness, regulatory heft, and supportive investment markets. In this background discuss the scope of green taxonomy and challenges and lack of consensus on green taxonomy in Indian financial sector.
2. Why has the UN asked the International Court of Justice to give an 'advisory opinion' on whether countries have legal obligations to protect people from climate extremities? Which country brought this issue to the UN? What is India's position?
3. According to estimates by the Indian Council of Medical Research, India is home to more than two million individuals with Autism Spectrum Disorder (ASD). A national programme for autism and neurodevelopmental conditions, supported by an articulated time-bound strategy, can pave the way forward for improving the lives of autistic people'. Comment.
4. Discuss the fundamental role of carbon pricing in the transition to a decarbonized economy. Give a brief outline of main types of carbon pricing and viable best practice in case of India.
5. 'The outcome of the legal tussle in the U.S. between four major publishers and the Internet Archive will have ramifications for 'Controlled Digital Lending' initiatives across the world'. Comment.
6. The UN 2023 Water Conference took place within the context of Sustainable Development Goal 6 (SDG 6) and not within the context of legally binding legal instruments on regulation of trans-boundary river water courses. Critically analyse.
7. Evaluate the Forest (Conservation) Amendment Bill 2023, recently introduced in Lok Sabha. Discuss how it addresses not only the contemporary issues such as climate change, carbon neutrality, etc. but also the security and strategic interests of the nation.
8. What are the challenges and implications of rupee an 'international currency' on a par with the dollar and the rest? Why is India making this move? What are the risks involved?
9. What will the amendments to the IT Rules, 2021, allow the Press Information Bureau to do on news flagged by the government as misinformation? Will this open up social media companies to legal action? Will online betting and gambling games be completely banned?
10. 'The Indian private sector is responding to the demands of the Second Space Age. It is poised for take-off, as a transformative growth multiplier like the IT industry did for the national economy in the 1990s'. Elaborate.
11. Why has Finland joined the North Atlantic Treaty Organization? What led to Finland's decision of staying neutral during and since the Cold War? What is the Paasikivi line? How has Russia responded to this move by its neighbour? Did the Russia-Ukraine war influence Finland's decision?
12. 'Despite the Bhutan-India relationship largely being defined by continuity, China is using its intimidation tactics to set the agenda for the region and threaten India's security and status'. Comment.
13. The former President of the U.S. Woodrow Wilson once remarked, 'It is not far from the truth to say that Congress in session is Congress on public exhibition, whilst Congress in Committee rooms is Congress at work.' Discuss the given statement in context of Parliamentary committees constituted by Indian Parliament.
14. What are the conditions under which a party can lose its standing as a national party? How does a State party gain or lose its status? What are the benefits of recognition?
15. 'The need for independent institutions and a system of checks and balances is essential to prevent the arbitrary use of power by the government. The appointment process of key constitutional positions needs to be safeguarded from the whims of the executive'. Keeping in mind the above statement, discuss the need to set up a well-defined criteria and procedure for the appointment of the CAG of India.
16. Elaborate how India's new Foreign Trade Policy (FTP) 2023 seeks to integrate India further into global value chains and to make India an export hub.
17. 'India's presidency of the G20 provides a unique opportunity for India to lead important healthcare priorities and play a huge role in addressing the fundamental causes of global health inequities'. Comment.
18. Over a longer term, heatwaves are predicted to become more intense, prolonged and frequent because of climate change. Policymakers must take mitigatory action early, while instituting structural infrastructure measures to help Indians adapt. Comment.
19. The Media One judgment has underlined the institutional capacity of the court in troubled political times. Elaborate.
20. Elaborate how India is an essential partner in the plan of the United Arab Emirates to strengthen food security in the Global South. Also discuss how India's ability to operationalise the world's largest

- food supply chains is strengthening the India-UAE food security partnership in a variety of ways.
21. 'The COVID-19 pandemic has shown that together, we can overcome unprecedented adversity. It's time to redefine India's and the world's TB elimination response with innovation and research being central drivers of change'. Comment.
 22. 'The Chengalpattu Botanical Garden (CBG) in Tamil Nadu will be India's largest botanical garden. As an example of complex engineering, botanical gardens represent the richness of life on earth and a metric of national success in science and outreach.' Comment.
 23. CRISPR technology has implications beyond possible warfare in multiple fields of research, ranging from agriculture, food production, biotechnology, food enhancement, and medicine. As genetic engineering continues to grow and find more avenues of impact, the need to optimise and regulate this technology will also heighten. Elaborate.
 24. The goal of connecting a large part of South Asia with Southeast Asia can be steered by the troika of Bangladesh, India and Japan using the Northeast as a focal point. Critically examine the challenges and opportunities associated with this troika.
 25. Pumped storage and battery technology are perfect complements in the India's energy storage ecosystem. Give a brief note on the recently issued guidelines on pumped storage. What factors need to be considered to make it succeed in Indian context?

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. (a) | 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. (a) | 66. (a) | 67. (b) | 68. (c) | 69. (d) | 70. (a) |
| 71. (a) | 72. (b) | 73. (c) | 74. (d) | 75. (a) | 76. (a) | 77. (b) | 78. (c) | 79. (d) | 80. (a) |
| 81. (a) | 82. (b) | 83. (c) | 84. (d) | 85. (a) | 86. (a) | 87. (b) | 88. (c) | 89. (d) | 90. (a) |
| 91. (a) | 92. (b) | 93. (c) | 94. (d) | 95. (a) | 96. (a) | 97. (b) | 98. (c) | 99. (d) | 100. (c) |
| 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. (d) | 122. (b) | 123. (c) | 124. (d) | 125. (a) | | | | | |



19 वर्षों से ईमानदार प्रयास

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