



DIKSHANT TODAY

FEBRUARY 2024



What's special

आर डी ओ

- ⇒ SHREYAS
- ⇒ Karpoori Thakur to be awarded Bharat Ratna
- ⇒ Sapinda' marriages
- ⇒ Mayurbhanj red ant chutney
- ⇒ Pradhan Mantri Suryodaya Yojana
- ⇒ Square Kilometer Array project

- ⇒ Legal dispute over AMU's minority status
- ⇒ Henley Passport Index 2024
- ⇒ Exercise Desert Cyclone
- ⇒ ISRO PSLV C58 XPoSat mission
- ⇒ India First Graphene Centre
- ⇒ Practice Question For UPSC Pre. & Mains Exam



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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

Tej Prakash, Prakash Jaiswal, Shagla

EDITING SUPPORT

Bhoolan Prasad, Md. Shoab,
Neha Kumari, Jaya Soni

TYPE SETTING AND DESIGNING

Suryajeet, Sunil



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HEAD OFFICE

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

Contact: 7428092240, 9312511015, 8851301204

Email : dikshantias2011@gmail.com

Web.: www.dikshantias.com

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POLITY & GOVERNANCE

SC LEGAL SERVICES COMMITTEE



Why in news?

- Recently, the Supreme Court judge Justice BR Gavai has been nominated as the Chairman of the Supreme Court Legal Services Committee (SCLSC), replacing Justice Sanjiv Khanna, the seniormost judge of the top court after the Chief Justice of India (CJI).

What is the Supreme Court Legal Services Committee?

- The Supreme Court Legal Services Committee was constituted under Section 3A of the Legal Services Authorities Act, 1987, to provide "free and competent legal services to the weaker sections of society", in cases falling under the top court's jurisdiction.
- Section 3A of the Act states that the Central Authority (the National Legal Services Authority or NALSA) shall constitute the committee.
- It consists of a sitting SC judge, who is the chairman, along with other members possessing the experience and qualifications prescribed by the Centre.
- Both the chairman and other members will be nominated by the CJI. Further, the CJI can appoint the Secretary to the Committee.

Who does the SCLSC comprise?

- As of date, the SCLSC consists of chairperson BR Gavai and nine members nominated by the CJI. The Committee, in turn, can appoint officers and other employees as prescribed by the Centre, in consultation with the CJI.
- Besides this, Rule 10 of the NALSA Rules, 1995, entails the numbers, experience, and qualifications of the SCLSC members. Under Section 27 of the 1987 Act, the Centre is empowered to make rules in consultation

with the CJI, by notification, to carry out the provisions of the Act.

What is the need for legal services and how is it dispensed to the people?

- The need for providing legal services has been underlined in many provisions of the Indian Constitution.
- Article 39A states, "The State shall secure that the operation of the legal system promotes justice, on a basis of equal opportunity, and shall, in particular, provide free legal aid, by suitable legislation or schemes or in any other way, to ensure that opportunities for securing justice are not denied to any citizen by reason of economic or other disabilities."
- Moreover, Articles 14 (right to equality) and 22(1) (rights to be informed of grounds for arrest) also make it obligatory for the State to ensure equality before the law and a legal system that promotes justice based on equal opportunity.
- Although the idea of a legal aid programme was earlier floated in the 1950s, it was in 1980 that a committee at the national level was established under the chairmanship of then SC judge Justice PN Bhagwati.

- The Committee for Implementing Legal Aid Schemes started monitoring legal aid activities throughout India.

NALSA:

- In 1987, the Legal Services Authorities Act was enacted to give a statutory base to legal aid programmes. It aims to provide free and competent legal services to eligible groups, including women, children, SC/ST and EWS categories, industrial workers, disabled persons, and others.
- Under the Act, NALSA was constituted in 1995 to monitor and evaluate the implementation of legal aid programmes and to lay down policies for making legal services available.
- A nationwide network has been envisaged under the Act for providing legal aid and assistance. It also disburses funds and grants to State Legal Services Authorities and NGOs for implementing legal aid schemes and programmes.

SLSA:

- Subsequently, in every state, State Legal Services Authorities (SLSA) were established to implement NALSA's policies and directions, give free legal services to people, and conduct Lok Adalats.

⇒ An SLSA is headed by the Chief Justice of the respective High Court and includes the senior HC judge as its Executive Chairman. While the HC Chief Justice is the patron-in-chief of the SLSA, the CJI is the patron-in-chief of NALSA.

DLSAs:

- ⇒ Similarly, District Legal Services Authorities (DLSAs) and Taluk Legal Services Committees were established in districts and most taluks. Situated in the District Courts Complex in every district, each DLSA is chaired by the District Judge of the respective district.
- ⇒ The Taluka or Sub-Divisional Legal Services Committees are headed by a senior civil judge.
- ⇒ Collectively, these bodies organise legal awareness camps, provide free legal services, and supply and obtain certified order copies and other legal documents, among other functions.

SCHOLARSHIPS FOR HIGHER EDUCATION FOR YOUNG ACHIEVERS SCHEME (SHREYAS) FOR OBC AND OTHERS



Why in news?

- ⇒ The scheme Scholarships for Higher Education for Young Achievers Scheme-SHREYAS, has been proposed to implement during the 2021-22 to 2025-26 by placing two ongoing Central Sector schemes for OBC and others namely:
 - a) National Fellowship for OBC
 - b) Dr. Ambedkar Central Sector Scheme of Interest Subsidy on Educational Loans for Overseas Studies for Other Backward Classes (OBCs) and Economically Backward Classes (EBCs).
- ⇒ The main objective of the schemes is Educational Empowerment of OBC & EBC students by way of awarding fellowship (financial assistance) in obtaining quality higher education and interest subsidy on educational loan for overseas studies.

The Scheme comprises following two components:

National Fellowship for OBC students

- ⇒ The scheme aims at providing financial assistance to the OBC students in obtaining quality higher education leading to degrees such as M.Phil and Ph.D

in universities, research institutions and scientific institutions.

- ⇒ The scheme is designed to provide a total number of 1000 Junior Research Fellowships per year to undertake advanced studies and research leading to M.Phil. /Ph.D. Degrees, who have qualified in the following tests:
 - ⇒ National Eligibility Test – Junior Research Fellowship (NET-JRF) of UGC (for Humanities/Social Sciences) or
 - ⇒ UGC-Council of Scientific and Industrial Research (UGC-CSIR) NET-JRF Joint Test (for Sciences)
 - ⇒ The scheme covers all universities/institutions recognized by the University Grants Commission (UGC) and are implemented by the UGC itself on the pattern of the scheme of UGC Fellowships being awarded to research students pursuing M.Phil. and Ph.D.

Salient features of the Scheme:

- ⇒ The scheme is now implemented by the Ministry through the designated Central Nodal Agency; National Backward Classes Finance and Development Corporation (A Govt. of India Undertaking, under the administrative control of Ministry of Social Justice & Empowerment
- ⇒ All universities/institutions recognized by the University Grants Commission (UGC).
- ⇒ Eligibility conditions are as per notification for UGC-NET and CSIR-UGC-NET examinations.
- ⇒ The rate of fellowship for JRF level has been increased and w.e.f. 01.01.2023, it is Rs. 37000/- per month and for SRF level it is Rs. 42000/- per month, besides contingencies amount.
- ⇒ Out of 1000 slots available under this scheme, 750 will be allocated for the subjects under National Eligibility Test – Junior Research Fellowship (NET-JRF) of UGC and remaining 250 UGC-Council of Scientific and Industrial Research (UGC-CSIR) NETJRF joint test (for Science streams).
- ⇒ These 1000 slots will be over and above the OBC Students selected under the normal reservation policy of the Government.
- ⇒ At least 5% of the total seats should be reserved for students with disabilities while making selection of candidates for award of fellowships by the UGC.

Dr. Ambedkar Scheme of Interest Subsidy on Educational Loans for Overseas Studies for Other Backward Classes (OBCs) and Economically Backward Classes (EBCs):

- ⇒ This is a Central Sector Scheme to provide interest subsidy to the student belonging to the OBCs and EBCs on the interest payable for the period of moratorium for the Education Loans for overseas studies to pursue approved courses of studies abroad at Masters, M.Phil. and Ph.D. level.

Salient features of the Scheme:

- The scheme is implemented through the Canara Bank (the Nodal bank for the scheme).
- The Scheme is applicable for higher studies abroad. The interest Subsidy shall be linked with the existing Educational Loan Scheme of Indian Banks Association (IBA) and restricted to students enrolled for course at Masters, M.Phil and Ph.D level.
- The students should have secured admission in the approved courses at Masters, M.Phil or Ph.D levels abroad for the courses listed in the guidelines.
- For OBC candidates, total income from all sources of the employed candidate or his/her parents/guardians in case of unemployed candidate shall not exceed present Creamy Layer criteria.
- For EBC candidates, total income from all sources of the employed candidate or his/her parents/guardians in case of unemployed candidate shall not exceed Rs.5.00 lakh per annum
- 50% of the total financial assistance is reserved for women candidates.
- Under the scheme, 100% interest payable by the students availing the education loans of the IBA for the period of moratorium (i.e. course period, plus one year or six months after getting job, whichever is earlier) as prescribed under the Education Loan Scheme of the IBA, shall be borne by the Government of India.
- After the period of moratorium is over, the interest on the outstanding loan amount shall be paid by the student, in accordance with the existing Educational Loan Scheme as may be amended from time to time.
- The candidate will bear the Principal installments and interest beyond moratorium period.

WHY HAVE TRUCK DRIVERS CALLED FOR A STRIKE?



Why in news?

- Truck drivers announced a month-long strike on January 1 to protest against stricter punishment for hit-and-run cases under the new law, the Bharatiya Nyaya Sanhita (BNS), 2023.
- On the second day of the strike, the Ministry of Home Affairs (MHA) held a meeting with one of the

transporters' bodies, the All-India Motor Transport Congress (AIMTC), to defuse the situation.

What is the hit-and-run clause?

- Section 106 (1) of the BNS says, "Whoever causes death of any person by doing any rash or negligent act not amounting to culpable homicide, shall be punished with imprisonment of either description for a term which may extend to five years, and shall also be liable to fine."
- Section 106 (2) states, "Whoever causes death of any person by rash and negligent driving of vehicle not amounting to culpable homicide, and escapes without reporting it to a police officer or a Magistrate soon after the incident, shall be punished with imprisonment of either description of a term which may extend to ten years, and shall also be liable to fine."
- Currently, under Section 304A of the Indian Penal Code (IPC), which will be replaced by the Bharatiya Nyaya Sanhita, the punishment for causing death by negligence is two years imprisonment and fine, or both.
- The BNS also does not provide the relief provided under Section 134 in the Motor Vehicles Act, 1988 which lays down the duty of a driver in case of an accident and requires him to secure medical attention for the injured person unless "it is not practicable to do so on account of mob fury or any other reason beyond his control."

How did the govt. respond to the strike?

- The MHA held a meeting with the AIMTC, following which Home Secretary Ajay Bhalla appealed to drivers to return to work assuring them that the new law had not been implemented yet, and any decision to invoke Section 106 (2) of the BNS would be taken after consulting the AIMTC.
- While this helped dampen the protest, truck drivers have distanced themselves from the AIMTC which they say is a transporter's body and doesn't represent them.
- Truck driver's associations in several States, including the All Punjab Truck Operator's Union (APTOU), continue to hold demonstrations through roadblocks, and have threatened to further intensify their protest in the coming days if the government fails to withdraw the penalties.

Concerns:

- Truckers have said the changes in the new law have been brought without any consultations with them.
- They say that the jail term and fine are too steep for drivers who earn only ₹10,000 to ₹15,000 per month and that the new law fails to provide a detailed accident investigation protocol in the country, in the absence of which drivers of heavy vehicles will continue to be deemed guilty even before an investigation is conducted.

What do road accidents data say about hit-and-run cases?

- A total number of 4,61,312 road accidents were reported across the country in the calendar year 2022, claiming 1,68,491 lives. Of these, 56% accidents and 60.5% of fatalities occurred on National and State Highways.
- Trucks accounted for 9% of total accident deaths and buses 3.5%. Hit-and-run cases were 18.1% of total accident deaths.

What needs to be done?

- Truck drivers are a vulnerable category of road users and easy targets for the police who tend to deem drivers of heavier vehicles guilty.
- There is a need for police training in not just implementing the IPC (now BNS), but also in how to establish rash and negligent driving with the help of driving regulations such as the Motor Vehicles Act, 1988, and Motor Vehicles (Driving) Regulations 2017.
- There is need for better use of forensic evidence for violations such as speeding by capturing tyre marks, which is absent.
- There are many factors beyond the control of drivers of heavy vehicles, such as assigning the left-most lane on roads for buses and trucks which are also used by cyclists and even pedestrians where there are no footpaths.
- There is the issue of driver fatigue which should be addressed by regulating their working hours as well as ensuring that their truck cabins are ergonomic so that they are comfortable and in better control of the vehicle they are driving.

SC OVERTURNS REMISSION GIVEN TO BILKIS BANORAPISTS



Why in news?

- The Supreme Court has struck down the remission granted to 11 men convicted in the Bilkis Bano gangrape case of 2002.
- The court has ruled that the Gujarat government's decision to remit their sentences and set them free was illegal.

Background:

- Bilkis was gangraped and seven members of her family were murdered during the Gujarat riots of 2002. The 11 convicts were released by the Gujarat government under its remission and premature release policy on August 15, 2022.

What was the issue before the court here?

- It was essentially whether Gujarat had the authority to issue the order for the remission of the sentences.
- The crime had been committed on March 3, 2002 in Chapparwad village in Gujarat's Dahod district, but the trial took place in Mumbai, where a special court convicted and sentenced the accused in 2008.
- The Supreme Court noted that the appropriate government to decide remission is the state within whose jurisdiction the accused were sentenced and not the state within whose territorial limits the offence was committed or the accused were imprisoned.
- Therefore, the court ruled that the competent government in this matter would be the Maharashtra government.

What is the law on remission of sentences?

- Under Articles 72 and 161 of the Constitution, the President and Governors of states can pardon a convict, and can also suspend, remit, or commute a sentence passed by the courts.
- State governments too have the power to remit sentences under Section 432 of the Code of Criminal Procedure (CrPC). This is because prisons is a State Subject.
- However, Section 433A of the CrPC puts certain restrictions on these powers of remission. It says: "Where a sentence of imprisonment for life is imposed on conviction of a person for an offence for which death is one of the punishments provided by law, or where a sentence of death imposed on a person has been commuted under Section 433 into one of imprisonment for life, such person shall not be released from prison unless he had served at least fourteen years of imprisonment."

What are the grounds for remission?

- States set up a Sentence Review Board to exercise the powers under Section 432 of the CrPC. The Supreme Court has held that states cannot exercise the power of remission arbitrarily, and must follow due process. While the policy varies from state to state, broadly the grounds for remission considered by the Board are the same.
- These factors to be considered while making a decision on granting remission are: seriousness of the crime, the status of the co-accused, and conduct in jail.
- In 'Laxman Naskar v. Union of India' (2000) the SC laid down five grounds on which remission is considered:
 - a) Whether the offence is an individual act of crime that does not affect the society;

- b) Whether there is a chance of the crime being repeated in future;
 - c) Whether the convict has lost the potentiality to commit crime;
 - d) Whether any purpose is being served in keeping the convict in prison; and
 - e) Socio-economic conditions of the convict's family.
- Jail manuals contain rules that allow certain days of remission in every month for good behaviour of convicts. For those serving fixed sentences, the remission days are accounted for while releasing the convict.
 - However, convicts serving life sentences are entitled to seek remission only after serving a minimum of 14 years.

What happened in the Bilkis Bano case?

- One of the convicts, Radheshyam Shah, moved the Supreme Court in 2022 after he had completed 15 years and four months of the life term awarded to him by a CBI court in Mumbai.
- Radheshyam Shah sought directions to the Gujarat government to consider his application for premature release under its 1992 remission policy.
- Shah argued that the Gujarat HC had rejected his prayer on July 17, 2019 on the premise that since the trial had been concluded in Maharashtra, the application for premature release must also be filed in Maharashtra, and not in Gujarat.
- In an order dated May 13, 2022, an SC Bench of Justices asked the Gujarat government to consider Shah's application for premature release "within a period of two months".
- Gujarat was the "appropriate government" to decide on questions like remission or premature release because it was there that "the crime was committed and not the State where the trial stands transferred and concluded for exceptional reasons under the orders of this Court".

What is Gujarat's remission policy?

- The remission policy that was notified in 1992 permitted prisoners to apply for remission "on the basis that life imprisonment is an arbitrary or notional figure of twenty years of imprisonment". But this policy was invalidated by the SC in November 2012.
- Following the SC order and instructions issued subsequently by the Union Home Ministry to all states and Union Territories, the Gujarat government formulated a fresh policy in 2014.
- This contained an annexure listing cases where remission could not be granted – among them were those in which the prisoners were convicted for a crime that was investigated by an agency under the Delhi Special Police Establishment Act (CBI, which was in the investigating agency in the Bilkis case),

and prisoners convicted for murder with rape or gangrape.

THE LAWS AROUND REMISSION POLICY



Why in news?

- The Supreme Court recently set aside the remission of 11 convicts sentenced to life imprisonment for the gang rape of Bilkis Bano and murder of her family, during the 2002 communal riots in Gujarat.
- The remission order was passed by the Gujarat government in August 2022.

What are clemency powers?

- Article 72 and 161 of the Constitution provide powers to the President and Governor respectively to grant pardon, commutation, remission, respite or reprieve to a convict.
- These are sovereign powers vested in the heads of the Union and State executive to be exercised on the advice of the council of ministers.
- Apart from this, the appropriate State government under Section 432 of the Criminal Procedure Code, 1973 (CrPC) may remit the whole or part of the punishment to which a convict has been sentenced.
- In case of life imprisonment convicts, this remission can be done only after a period of 14 years in jail as per Section 433A of the CrPC.

What is the background to the remission in this case?

- The heinous crimes for which the 11 persons were convicted were committed in Gujarat in March 2002. However, considering the need for fair trial, these cases were shifted to Maharashtra by the Supreme Court in 2004. A CBI trial court in Mumbai sentenced the convicts to life imprisonment in 2008.
- One of the convicts, Radheshyam Shah, moved the Supreme Court in 2022 seeking directions to the Gujarat government to consider his remission application under the State's 'Remission policy' of 1992.
- The argument was that this was the policy in force at the time of the commission of offence (2002) and at the time of sentencing (2008).

- ⇒ The Supreme Court in an order in May 2022, directed the Gujarat government to consider Shah's application for premature release under the 1992 policy.
- ⇒ The Godhra Jail Advisory Committee (JAC) headed by the District Magistrate unanimously recommended the remission of sentence for the 11 convicts and they were freed in August 2022.

What are the issues involved?

- ⇒ The premature release of the 11 convicts by the Gujarat government raised certain serious legal and moral questions.

Appropriate State government for considering the remission application:

- ⇒ The provisions of CrPC are quite clear, that the appropriate State government for considering the remission application should have been Maharashtra where the sentencing happened and not Gujarat where the offence was committed or jail term was being served.
- ⇒ Also, the law requires the opinion of the presiding judge of the convicting court to be obtained before considering the remission petition, which was not followed in this case.

Grounds for remission:

- ⇒ The Supreme Court in Laxman Naskar versus Union of India (2000) had laid down five grounds on which remission is to be considered. The first of these is whether the offence is an individual act of crime that does not affect society.
- ⇒ It would be preposterous to surmise that such a heinous crime does not impact the conscience of a civilised society.

Case-by-case basis:

- ⇒ The Supreme Court in Sangeet versus State of Haryana (2012) had held that a convict serving life imprisonment does not have a right to be prematurely released on completion of 14 years in jail and that remission should be considered only on a case-by-case basis.
- ⇒ In light of this judgment, the Union Home Ministry had issued an advisory in February 2013 prescribing that remission should not be granted in a 'wholesale manner'.
- ⇒ The Gujarat government had revised its 'Remission policy' in 2014 in line with this advisory and had explicitly barred remission for those convicted of rape and murder. However, the instant remission was granted based on the policy of 1992 (that had no such exclusions) as it was in force at the time of conviction.

What did the Supreme Court rule?

- ⇒ The Supreme Court in its order categorically held that the Gujarat government is not the appropriate government to consider the remission petition.
- ⇒ It held that the May 2022 order of the Supreme Court, that asked the Gujarat government to consider the

remission petitions, was obtained through fraud and suppression of facts before the court.

- ⇒ Hence, it held the May 2022 order of the Supreme Court to be a nullity. It further ordered the surrender of all the 11 persons before jail authorities within two weeks.
- ⇒ It held that the appropriate government for considering the remission petitions in the instant case is Maharashtra and it may consider their petitions in accordance with law and the guidelines laid down by the Court.
- ⇒ This order has reinforced the faith in our judicial system and 'rule of law' by setting aside a blatantly perverse order that shook the conscience of society at large and women in particular.
- ⇒ It is expected that the Maharashtra government would follow the guidelines laid down by the Supreme Court in the Laxman Naskar case under which such crimes that affects the society at large deserve no mercy.

WHY WAS FCRA REGISTRATION FOR SEVERAL NGOS CANCELLED?



Why in news?

- ⇒ The Foreign Contribution Regulation Act, 2010 (FCRA) registration of two prominent non-governmental organisations (NGOs); Centre for Policy Research (CPR) and World Vision India (WVI) have been cancelled recently.

Who monitors the process?

- ⇒ The Union Ministry of Home Affairs (MHA) monitors the implementation of the FCRA. The registration of thousands of NGOs was due for renewal in 2020-2021. Due to the COVID-19 pandemic and the amendments to the FCRA Act in 2020, many NGOs could not complete the process.
- ⇒ The MHA had given a relief up to September 30, 2021 to NGOs whose registration was expiring between September 29, 2020 and September 30, 2021 to apply for a renewal. The MHA has extended the deadline multiple times; the latest date being March 31, 2024.

About FCRA:

- ⇒ Through the FCRA, the ministry regulates foreign donations to ensure that such funds do not adversely

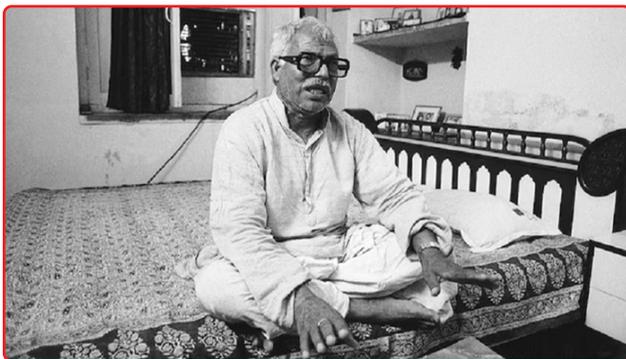
affect the country's internal security. It is compulsory to register under the Act, first enacted in 1976, if an association, group or NGO intends to receive foreign donations.

- ⇒ The 1976 Act was repealed and replaced with a new legislation in 2010. It was further amended in 2020. The registration is valid for five years, after which the NGO has to apply for a renewal.
- ⇒ It is mandatory for all such NGOs to register under the FCRA, initially valid for five years that can be renewed if it complies with all norms. Registered groups can receive foreign contribution for social, educational, religious, economic and cultural programmes.

Why were CPR and WVI's registrations cancelled?

- ⇒ The MHA alleged that CPR diverted foreign donations to fund "protests and legal battles against developmental projects" and misused funds to "affect India's economic interests." It alleged that the CPR engaged in production of current affairs programmes which violated FCRA norms.
- ⇒ CPR had furnished a report on air pollution, "Overview on the Commission for Air Quality Management Act 2021, policy challenges for the new government etc."
- ⇒ The MHA said publishing of current affairs programme using foreign funds is prohibited under Section 3 of the FCRA.
- ⇒ CPR said that the ministry's decision is incomprehensible and disproportionate, and some of the reasons given challenge the very basis of the functioning of a research institution.
- ⇒ The registration of WVI was cancelled for alleged FCRA violations from 2012-13 to 2020-21. WVI is the recipient of the highest amount of foreign donations among all NGOs registered under the Act in 1986.

FORMER BIHAR CHIEF MINISTER KARPOORI THAKUR TO BE AWARDED BHARAT RATNA



Why in news?

- ⇒ Recently, the Prime Minister announced his government's decision to confer the highest civilian award, the Bharat Ratna on former Bihar Chief Minister Karpooori Thakur.

Karpooori Thakur formula:

- ⇒ Karpooori Thakur introduced reservations for the most backward castes (MBCs) in the state within the larger quota for backward castes, or OBCs, in 1978.
- ⇒ Referred to as the 'Karpooori Thakur formula', it predated the Mandal Commission implementation by 12 years.

Background:

- ⇒ In 2017, the Modi government instituted the G Rohini Commission for sub-categorizing the OBC quota to ensure extremely backward classes (EBCs) accrue the benefits of reservation, which dominant OBCs, such as the Yadavs, are perceived to have cornered. The commission submitted its report in 2023.
- ⇒ However, the decision to confer the Bharat Ratna on Karpooori Thakur, who hailed from a poor nai (barber) caste, also strikes at the dominant OBC versus extremely backward classes' social dynamics in Bihar.

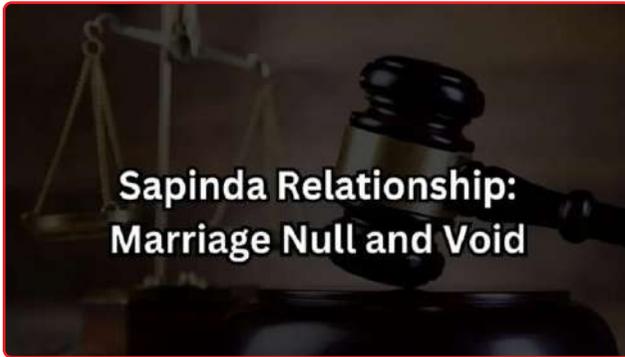
About Karpooori Thakur:

- ⇒ Born on January 24, 1924, Karpooori Thakur participated in the freedom struggle and was a member of the Congress Socialist Party and later the Praja Socialist Party.
- ⇒ He was the legislator of the Bihar assembly from 1952 until his death in February 1988, barring a brief stint as a Lok Sabha member in 1977, which he quit to become the Bihar chief minister.
- ⇒ Karpooori Thakur was the Bihar chief minister for two stints, from December 1970 to June 1971 and June 1977 to April 1979.
- ⇒ Apart from introducing reservations, Karpooori Thakur was a votary of giving government contracts to unemployed youth, such as engineers, arming Dalits so that they could defend against attacks by upper caste militias, and advocating the use of Hindi in education and official work.

About Bharat Ratna:

- ⇒ 'Bharat Ratna', the highest civilian Award of the country, was instituted in the year 1954.
- ⇒ Any person without distinction of race, occupation, position or sex is eligible for these awards.
- ⇒ It is awarded in recognition of exceptional service/performance of the highest order in any field of human endeavour.
- ⇒ The recommendations for Bharat Ratna are made by the Prime Minister himself to the President. No formal recommendations for this are necessary.
- ⇒ The number of annual awards is restricted to a maximum of three in a particular year.
- ⇒ On conferment of the award, the recipient receives a Sanad (certificate) signed by the President and a medallion.
- ⇒ The Award does not carry any monetary grant.

DELHI HIGH COURT REAFFIRMED THE BAN ON 'SAPINDA' MARRIAGES



Why in news?

- Recently, the Delhi High Court rejected a challenge to the constitutionality of Section 5(v) of the Hindu Marriage Act, 1955 (HMA), which prohibits marriage between two Hindus if they are "sapindas" of each other "unless the custom or usage governing each of them permits of a marriage between the two".

What is a sapinda marriage?

- A sapinda marriage is one between individuals who are related to each other within a certain degree of closeness. Sapinda relationships for the purposes of the HMA are defined in Section 3 of the Act.
- "Two persons are said to be sapindas of each other if one is a lineal ascendant of the other within the limits of sapinda relationship, or if they have a common lineal ascendant who is within the limits of sapinda relationship with reference to each of them," Section 3(f)(ii) says.
- Under the provisions of the HMA, on the mother's side, a Hindu individual cannot marry anyone who is within three generations of them in the "line of ascent". On the father's side, this prohibition applies to anyone within five generations of the individual.
- In practice, this means that on their mother's side, an individual cannot marry their sibling (first generation), their parents (second generation), their grandparents (third generation), or an individual who shares this ancestry within three generations.
- On their father's side, this prohibition would extend up to their grandparents' grandparent, and anyone who shares this ancestry within five generations.
- If a marriage is found to violate Section 5(v) for being a sapinda marriage, and there is no established custom that allows such a practice, it will be declared void.
- This would mean that the marriage was invalid from the very beginning, and will be treated as though it never took place.

Exceptions to the prohibition against sapinda marriages:

- The sole exception can be found within the same provision. It arises when the customs of each individual permits sapinda marriages.

- The definition of the word "custom" is provided in Section 3(a) of the HMA. It states that a custom has to be "continuously and uniformly observed for a long time", and should have gained enough legitimacy among Hindus in a local area, tribe, group, or family, such that it has obtained "the force of law".
- A custom may not be protected even after these conditions are fulfilled. The rule in question must be "certain and not unreasonable or opposed to public policy" and, "in the case of a rule [that is] applicable only to a family", it should not have been "discontinued by the family".

On what grounds was the law challenged?

- In 2007, the woman's marriage was declared void after her husband successfully proved that they had entered into a sapinda marriage, and that the woman was not from a community where such marriages could be considered a custom. This ruling was challenged before the Delhi HC, which dismissed the appeal in October 2023.
- The woman then approached the HC again, challenging the constitutional validity of the prohibition on sapinda marriages. She argued that sapinda marriages are prevalent even when there is no proof of custom. Hence, Section 5(v) which prohibits sapinda marriages unless there is an established custom, violates the right to equality under Article 14 of the Constitution.
- The petitioner also argued that the marriage had received the consent of both families, which proved the legitimacy of the marriage.

What did the High Court say?

- A Bench of Acting Chief Justice Manmohan and Justice Manmeet Pritam Singh Arora held that the petitioner did not provide "stringent proof" of an established custom, which is necessary to justify a sapinda marriage.
- The Delhi HC also held that the choice of a partner in a marriage can be subject to regulation. With this in mind, the court held that the woman did not present any "cogent legal ground" to show that the prohibition against sapinda marriages was violative of the right to equality.

Are marriages similar to sapinda marriages allowed in other countries?

- In several European countries, the laws on relationships that are considered incestuous are less stringent than in India.
- In France, the crime of incest was abolished under the Penal Code of 1810, so long as the marriage was between consenting adults.
- This Code was enacted under Napoleon Bonaparte, and was also enforced in Belgium. A new Penal Code was introduced in Belgium in 1867 to replace the French code, but incest remains legal.

- Portuguese law also does not criminalise incest.
- The Republic of Ireland recognised same-sex marriages in 2015, but the law on incest has not been updated to include individuals in same-sex relationships.
- Under Italian law, incest is a crime only if it causes a “public scandal”.
- In the United States, incestuous marriages are banned in all 50 states, though incestuous relationships between consenting adults are allowed in New Jersey and Rhode Island.

INTERNATIONAL RELATIONS

CENTRE SET TO END FREE MOVEMENT REGIME AT UNFENCED MYANMAR BORDER



Why in news?

- The Union government is all set to scrap the Free Movement Regime (FMR) along the Myanmar border.
- People living in border areas, who could cross over to India, will soon require visas.

Details:

- India and Myanmar share an unfenced border, and people on either side have familial and ethnic ties, which prompted the arrangement in the 1970s. It was last revised in 2016.
- Around 300 km of the border will be fenced. A survey of the border areas with the help of drones has been completed.

FMR:

- Under the FMR, every member of the hill tribes, who is either a citizen of India or a citizen of Myanmar, and who resides within 16 km on either side of the border, can cross the border on production of a border pass, usually valid for a year, and can stay for up to two weeks per visit.
- The FMR was introduced in 2018 when relations between the Indian government and Myanmar were on the rise. The agreement aimed to facilitate people-to-people ties between the countries as residents in the region enjoy strong ethnic and familial relations on both sides of the border.
- The Manipur government has suspended the FMR since 2020, following the COVID-19 pandemic.

- Manipur Chief Minister has urged the Ministry of Home Affairs (MHA) to cancel the FMR along the India-Myanmar border and complete its fencing. He attributed the ongoing ethnic violence in the State to the free movement of people from across the border.

Migrant influx:

- After a military coup in Myanmar in February 2021, there was an influx of undocumented migrants, over 40,000 refugees took shelter in Mizoram, and around 4,000 refugees are said to have entered Manipur.
- The migrants belonging to the Kuki-Chin-Zo ethnic group share ethnic ties with communities in Mizoram and Manipur.

India-Myanmar border:

- India shares a 1,643 km-long border with Myanmar, which passes through the States of Arunachal Pradesh (520 km), Nagaland (215 km), Manipur (398 km), and Mizoram (510 km).

CHINA WIDENS TRADE HIGHWAY IN SOUTH AMERICA WITH NEW MEGA PORT PROJECT



Why in news?

- A new Chinese mega port rising on the Pacific coast is promising to turbo charge South America's trade ties with China.
- The \$3.5 billion deep water port, set to start operations late in 2024, will provide China with a direct gateway to the resource-rich region.
- Over the last ten years, China has unseated the U.S. as the largest trade partner for South America, devouring its soy, corn and copper.

Chancay mega port:

- The port, majority-owned by Chinese state-owned firm Cosco Shipping, will be the first controlled by China in South America.
- It will be able to accommodate the largest cargo ships, which can head directly to Asia, cutting the journey time by two weeks for some exporters.
- Beijing and Lima will become a regional hub, both for copper exports from the Andean nation as well as soy from western Brazil, which currently travels through the Panama Canal or skirts the Atlantic before steaming to China.

⇒ The Chancay mega port aims to turn Peru into a strategic commercial and port hub between South America and Asia.

Part of 'Belt and Road' drive

- ⇒ Part of China's decade-old 'Belt and Road' drive, the new port embodies the challenge facing the U.S. and Europe as they look to counter China's rising influence in Latin America.
- ⇒ Some 150 countries have signed on to the Belt and Road with China, including 22 in Latin America.
- ⇒ Full construction started in 2018 at Chancay, some 80 kilometre north of Lima. Workers are now laying thousands of piles and breakwaters; work signs are written in white-on-red Chinese characters.
- ⇒ The first phase of Chancay is set to be completed in November 2024. Chinese President Xi Jinping, expected in Peru for an Asia-Pacific Economic Cooperation (APEC) summit that month, could inaugurate the port.
- ⇒ Peru's government is planning an exclusive economic zone near the port and Cosco wants to build an industrial hub near Chancay to process raw materials that could include grains and meat from Brazil before shipping them to Asia.

What it holds for China?

- ⇒ Fast-growing China needs the copper and lithium from South America's Andes, along with the corn and soy from the plains of Argentina and Brazil.
- ⇒ But its widening trade lead, some \$100 billion around South America in the most recent annual data brings extra clout.
- ⇒ China has in 2023 upgraded ties with Uruguay and Colombia to "strategic partnerships", the latter a U.S. ally.

INDIA, FRANCE, UAE CONDUCT JOINT MEGA AIR EXERCISE OVER ARABIAN SEA



Why in news?

- ⇒ Recently, India, France and the United Arab Emirates (UAE) carried out a mega air exercise over the Arabian Sea against the backdrop of the rising global concerns over Houthi militants targeting several commercial vessels in the strategic waterways in the region.

⇒ The exercise 'Desert Knight' featured several frontline aerial assets and combat jets of the air forces of the three countries.

Details:

- ⇒ The main focus of exercise 'Desert Knight' was on enhancing synergy and interoperability between the three air forces.
- ⇒ The exercise took place in the Indian FIR (Flight Information Regions) and with IAF aircraft operated from several bases in India.
- ⇒ All airspace worldwide is divided into FIRs and each of them is managed by a controlling authority responsible for ensuring that air traffic services are provided to aircraft flying within it.

Components:

- ⇒ The Indian Air Force (IAF) component at the drills consisted of Su-30 MKI, MiG-29 and Jaguar fighter jets besides AWACS (airborne early warning and control aircraft, C-130-J transport plane and air-to-air refuelling aircraft.
- ⇒ While the French participation included the Rafale fighter aircraft and a multi role tanker transport, the UAE Air Force fielded the F-16.

Significance:

- ⇒ The interactions during the exercise facilitated the exchange of operational knowledge, experiences and best practices amongst the participants.
- ⇒ Such exercises are indicative of the growing diplomatic and military interactions in the region, apart from showcasing the prowess of the IAF.

Republic Day 2024:

- ⇒ The trilateral exercise came days before India's Republic Day celebrations where two Rafale fighter jets and an Airbus A330 multi-role tanker transport aircraft of the French air force will also feature.
- ⇒ A 95-member marching contingent and 33-member band contingent from France will also take part in the parade.
- ⇒ French President Emmanuel Macron will be the Chief Guest at the Republic Day celebrations on January 26 that would make him the sixth leader from France to grace the prestigious annual event.

RECONSIDERING THE FREE MOVEMENT REGIME

Why in news?

- ⇒ At a passing out parade of the Assam police commandos in Guwahati, Union Home Minister said the 1,643 km India-Myanmar border would soon be fenced.
- ⇒ He also said the Free Movement Regime (FMR) agreement with Myanmar would be reconsidered to stop border residents from moving into each other's country without any paperwork.



Background:

- Much of India's present-day northeast was temporarily under Burmese occupation until the British pushed them out in the 1800s. The victors and the vanquished signed the Treaty of Yandaboo in 1826, leading to the current alignment of the boundary between India and Burma, later renamed Myanmar.
- The border divided people of the same ethnicity and culture specifically the Nagas of Nagaland and Manipur and the Kuki-Chin-Mizo communities of Manipur and Mizoram without their consent. In some stretches, the border split a village or a house between the two countries.

What is the FMR?

- The FMR came about in 2018 as part of the Narendra Modi government's Act East policy. The Rohingya refugee crisis that began in August 2017 caused the delay.
- The FMR allows people living on either side of the border to travel up to 16 km inside each other's country without a visa. A border resident needs to have a border pass, valid for a year, to stay in the other country for about two weeks per visit.
- The FMR also envisaged the promotion of localised border trade through customs stations and designated markets apart from helping the people of Myanmar access better education and healthcare facilities on the Indian side of the border.

Why is the FMR being reconsidered?

- Apart from a 10 km stretch in Manipur, the India-Myanmar border through hills and jungles is unfenced. The security forces have for decades grappled with members of extremist groups carrying out hit-and-run operations from their clandestine bases in the Chin and Sagaing regions of Myanmar.
- The ease of cross-border movement, even before the FMR was in place, was often flagged for inward trafficking of drugs and outward trafficking of wildlife body parts.
- The trigger for the rethink on the FMR was the conflict that broke out between the majority Meitei and the tribal Kuki-Zo communities in Manipur on May 3, 2023.

- Over the past decade, the Manipur government has been expressing concern over the "influx" of Myanmar nationals, a euphemism for Kuki-Chins, calling for an Assam-like National Register of Citizens to weed out the "illegal immigrants".
- The theory gained currency after the conflict, which coincided with a few hundred Myanmar nationals taking refuge in Manipur to escape a civil war back home.
- In September 2023, Manipur Chief Minister Nongthombam Biren Singh blamed the ethnic violence on the free movement of Myanmar nationals into India and urged the Ministry of Home Affairs to end the FMR, which had been suspended on April 1, 2020, during the COVID-19 lockdown.
- The suspension was extended after the military coup in Myanmar in February 2021. Kuki-Zo organisations, on the other hand, have accused the Chief Minister of branding the community as "illegal immigrants" and "narco-terrorists" to justify their "ethnic cleansing".

What is the scale of migration?

- The civil war in Myanmar saw a drastic jump in the number of people seeking refuge in India. In September 2022, authorities in Manipur pushed back 4,300 of some 5,500 Myanmar nationals from the Moreh area along the border after recording their biometrics.
- A committee set up by the State government put the number of such migrants in 2023 at 2,187.
- The civil war in the neighbouring country also forced some 40,000 people into Mizoram, who, unlike Manipur, made them feel at home primarily due to their ethnic affiliation.
- The Mizoram government has been seeking funds from the Centre to look after the displaced people who it wants to be sent back only after the situation in their country normalises.

Why are Mizoram and Nagaland opposed to ending the FMR?

- Mizoram Chief Minister Lalduhoma said his government does not have the authority to stop the Centre from fencing the India-Myanmar border for perceived security threat and scrapping the FMR, but said he was opposed to the move.
- According to him, the border was imposed by the British to divide the people belonging to the Zo ethnic stock.
- The Naga Students' Federation condemned the Centre's move. It said that it is crucial for India to acknowledge the historical truth that these territories (between the Chindwin River in Myanmar and the Saramati mountain in Nagaland) belong to the Nagas.

ECONOMY

WHY DID FIU IND ACT AGAINST VIRTUAL ASSET PROVIDERS



Why in news?

- Recently, the Financial Intelligence Unit India (FIU IND) issued show-cause notices to nine offshore virtual digital asset service providers (VDA SPs), including Binance, Kucoin, Huobi, Bitfinex and MEXC Global, among others.
- This was for “operating illegally” without complying with the provisions of the Prevention of Money Laundering Act, 2002 (PMLA).
- It has also been written to the Secretary of the Ministry of Electronics and Information Technology to block URLs of the mentioned entities.

What is the premise of the non-compliance?

- In March 2023, Virtual Digital Asset Service Providers (VDA SPs) in India were brought under anti-money laundering/counter financing of terrorism regulations.
- They were mandated to comply with PMLA 2002, verify the identities of onboarded clients, and maintain records of their financial positions and potentially suspicious transactions. This obligation applies to all VDA SPs operating in India irrespective of physical presence.
- Non-registration made entities non-compliant despite serving Indian users. To put it in perspective, the entities “though catering to a substantial part of Indian users were not getting registered and coming under the Anti Money Laundering (AML) and Counter Financing of Terrorism Network (CFT) framework”. Currently, 31 VDA SPs have registered with FIU IND.

What purpose does the PMLA compliance serve?

- The objective of the PMLA and its reporting obligation are to enable monitoring and tracking of financial transactions to curb money laundering and terror financing.
- It addresses one of the primary concerns of any regulator about the purported anonymity of the crypto assets and their potential use for unlawful purposes.

The mandatory KYC verifications would ensure lack of anonymity and businesses not encountering multiple hurdles.

- The government has made it amply clear that it intends to enforce PMLA obligations on offshore entities if they satisfy the ingredients of the March 2023 PMLA notification on VDA SPs.
- This is also in line with India's efforts through the G-20 where it has been advocating for global regulation of cryptocurrency and consequently the framework proposed by the International Monetary Fund and the Financial Stability Board to the G-20 in September 2023 is likely to be actioned in 2024.

What considerations emerge when looking to regulate VDAs?

- The Bureau for International Settlements (BIS), which is the global forum for cooperation among central banks, in a report about financial stability from crypto assets in emerging economies (August 2023) observed three high-level policy options under consideration. These include an outright ban, containment and regulation.
- BIS observed that an outright ban may not prove enforceable. This is because of the pseudo-anonymous nature of crypto markets. There could be a possibility that regulators lose all sight of the market, further shrinking their transparency and making them less predictable.
- Containment would imply controlling the flows between crypto markets and traditional financial systems. However, BIS argued that the strategy would not address the vulnerabilities inherent in the crypto markets and could result in financial stability risks.
- About regulation, motivation to regulate the asset varies across jurisdictions. The report holds that it must be ensured that the benefits of regulating and supervising are greater than the costs involved.
- Furthermore, for emerging market economies three issues are of importance, that is:
 - a) defining the (regulatory) authority or entity and their scope,
 - b) then the scope of regulation in terms of either activity or entity, and lastly,
 - c) filling in the data gaps to understand the technology and interconnections.

INDIA 1991 CRISIS AND THE RBI GOVERNOR ROLE

Why in news?

- S.Venkitaramanan, an IAS officer who served as the Governor of the Reserve Bank of India (RBI) from December 1990 to December 1992 passed away recently.
- Two events in which he had participated are worth recording.



Balance of payments in 1990s:

- Starting in late 1990, India faced a severe balance of payments stress. This had been precipitated by a slowing of inward remittances and a rise in the price of oil following the invasion of Kuwait by Saddam Hussain. The current account of the balance of payments was subjected to a double whammy, a reduction of receipts and a rise in the value of imports.
- In 1990-91 the current account deficit swelled to 3 percent of the GDP, a level highest by far in two decades. There was speculation that India would default on its external payment obligations.
- It was at that moment that the RBI led by Mr. Venkitaramanan played a sterling role, which in effect came to pledging its gold to international banks for a hard currency loan.

Pledging of India's gold reserves:

- In April 1991, the Government raised \$200.0 million from the Union Bank of Switzerland through a sale (with a repurchase option) of 20 tonnes of gold confiscated from smugglers (sic). Again, in July 1991, India shipped 47 tonnes of gold to the Bank of England to raise another \$405.0 million.
- This action helped the country repay its international donors and creditors, though it was not sufficient to completely absolve the country of the crisis.
- For the RBI to have used its gold to stave off a default was an act of courage. Indeed, it was the smartest economic management. It only needs to be recalled that India imports around 80 percent of its oil to recognise the practical value of the manoeuvre.
- Default would have narrowed India's access to the global loan markets to finance its imports were its export earnings to fall short in the future. With the sale and pledging of India's gold reserves, a breathing space within the payments crisis had been created.

Economic reforms:

- Before its efforts to raise international loans, the RBI had begun a programme of import compression, implemented mainly via raising the cash margin on imports. While this had commenced before Mr. Venkitaramanan had assumed office as Governor, it was under him that the policy assumed greater force.

- The cash margin was hiked four-fold between October 1990 and April 1991. Supplementary measures that raised the cost of imports were implemented too, together constituting a stringent effort to rein them in.
- This strategy turned out to be a winner, and the current account deficit flipped from a high of 3 percent in 1990-91 to a mere .3 percent of GDP in 1991-92. This almost eliminated the need to raise foreign exchange to finance India's non-debt payments.
- Though a government led by Narasimha Rao was to take office in mid-1991 and set in motion measures, including a devaluation of the rupee, to improve the balance of payments over the long term there is reason to believe that the immediate improvement of the balance of payments may be largely attributed to the import compression put in place by the RBI.
- This is implied by the data, which show that while imports contracted substantially in 1991-92 exports did not rise, they declined slightly.

Conclusion:

- At a critical time and in the thick of the BoP crisis, the main task of the Reserve Bank under the leadership of the Governor, S. Venkitaramanan, turned out to navigate the country through the troubled waters." The crisis was "successfully resolved".

INDIA LAUNCHES A SINGLE WINDOW PORTAL FOR MEDICAL DEVICES MANAGEMENT



Why in news?

- In a move to streamline the import, clinical investigations, and testing of medical devices, the Centre has launched the National Single Window System (NSWS).
- The NSWS has been established as a "genuine single-window system, which acts as a one-stop shop for all the approvals required by the investor and facilitates ease of doing business".

Details:

- The NSWS porta has been developed by Tata Consultancy Services (TCS).
- It facilitates applications for the certificate of registration and licences to manufacture or

import medical devices for various purposes, including clinical investigations, tests, evaluations, demonstrations, and training.

Medical devices in India:

- India's demand for medical devices is projected to reach \$50 billion by 2030. Currently, the country produces approximately \$7.6 billion worth of medical devices, exporting roughly \$3.4 billion.
- The annual demand for medical devices in India is estimated at around \$12 billion, with imports accounting for close to \$7.6 billion, or over 60 per cent, of the domestic requirement.
- However, the draft New Drugs, Medical Devices and Cosmetics Bill, 2023, expected to be tabled in Parliament soon, has triggered opposition from medical device makers, patient interest groups, and hospitals. They are advocating for a separate Bill for medical devices, distinct from drugs.

Background:

- Finance Minister Nirmala Sitharaman had previously announced the creation of an investment clearance cell (ICC) during her Budget speech on February 1, 2020.
- The proposed ICC, now developed as the NSWS, enables investors to identify, apply, track, and obtain the necessary approvals before starting any business operations in India, eliminating the need for investors to visit multiple IT platforms and authorities.

MAYURBHANJ RED ANT CHUTNEY RECEIVES GI TAG



Why in news?

- The Similipal kai chutney made with red weaver ants by the tribal people of Odisha's Mayurbhanj district received the geographical identity tag on January 2, 2024.
- The savoury chutney is popular in the region for its healing properties and also deemed important for nutritional security of the tribal people.

Nutrition:

- The scientists of OUAT Bhubaneswar analysed the red weaver ants and found it contains valuable proteins, calcium, zinc, vitamin B-12, iron, magnesium,

potassium, sodium, copper, amino acids, among others. Consuming the species can help boost the immune system and prevent diseases.

- Many indigenous people from Mayurbhanj district venture into nearby forest to collect kai pimpudi (red weaver ant).
- The tribal healers also prepare a medicinal oil in which they dip the ants along with pure mustard oil. After a month, this concoction is used as a body oil for babies and to cure rheumatism, gout, ringworm and other diseases by the tribes. The local people also consume this to stay fit and strong.

Indigenous:

- The red weaver ants are indigenous to Mayurbhanj and are found in abundance in the jungles of every block area of the district, including in the Similipal Tiger Reserve, throughout the year.
- Each year, tribals collect around three quintals of kai pimpudi from the forest in the district.

Habitat:

- The red weaver ants form colonies with multiple nests in trees. Each nest is made of leaves stitched together with the silk produced by their larvae.
- They mostly lodge in trees like mango, sal, jambu and jackfruit. The nests are strong enough against wind and impermeable to water.
- Kai's nests are usually elliptical in shape and range in size from single small leaf folded and bound onto itself to large nest consisting of many leaves and measure over half a metre in length.

Kai families:

- The Kai families consist of three categories of members – workers, major workers and queens. Workers and major workers are mostly orange coloured.
- Workers are 5-6 millimetres long, major workers are 8-10 mm long with strong legs and large mandibles and queens are 20-25 mm long and greenish brown coloured.
- They feed on small insects and other invertebrates like beetles, flies and hymenopterans.

Sting:

- They do not sting but have a painful bite into which they can secrete irritant chemicals from their abdomens.
- They are also recognised as bio-control agents because they are aggressive and will prey on most arthropods entering their territory. They protect a variety of tropical crops against insect pests, acting as an alternative to chemical insecticides.

About Geographical indications:

- Geographical indications assign products to the place of its origin. It conveys an assurance of quality and distinctiveness for such goods.

- Under Articles 1 (2) and 10 of the Paris Convention for the Protection of Industrial Property, geographical indications are covered as an element of Intellectual Property Rights.
- They are also covered under Articles 22-24 of the Trade Related Aspects of Intellectual Property Rights (TRIPS) Agreement.

MOU BETWEEN INDIA AND GUYANA ON COOPERATION IN THE HYDROCARBON SECTOR



Why in news?

- The Union Cabinet has approved the signing of Memorandum of Understanding (MoU) between the Ministry of Petroleum & Natural Gas, Government of India and the Ministry of Natural Resources, Republic of Guyana on cooperation in the hydrocarbon sector.

Details:

- The proposed MoU covers the complete value chain of hydrocarbon sector including sourcing of crude oil from Guyana, participation of Indian companies in Exploration and Production (E&P) sector of Guyana, cooperation in the areas of crude Oil refining, capacity building, Strengthening bilateral trade, collaboration in natural gas sector, collaboration in developing regulatory policy framework in oil & gas sector in Guyana; Cooperation in the area of clean energy including biofuels as well as renewables sector including solar energy etc.

Impact:

- The MoU on cooperation in hydrocarbon sector with Guyana will strengthen bilateral trade, foster investment in each other countries and help diversifying source of crude oil, thus augmenting the energy & supply security of the country.
- It will also provide opportunity to Indian company to participate in E&P sector of Guyana, gaining experience by working with global oil & gas companies in upstream projects, thus fostering the vision of "Aatmanirbhar Bharat".

Implementation strategy and targets:

- This MoU shall enter into force on the date of its signature and will remain in force for a period of five years and shall be automatically renewed thereafter

on a quinquennium basis unless either Party gives the other Party a written notice three months in advance of its intention to terminate this Understanding.

Background:

- In recent times, Guyana has gained significant salience in the oil & gas sector becoming the world's newest oil producer. The new discoveries of 11.2 billion barrels of oil equivalent, amounts to 18% of total global Oil & Gas discoveries and 32% of discovered oil.
- As per OPEC World Oil Outlook 2022, Guyana is projected to see a significant ramp-up in production, with liquids supply growing from 0.1 mb/d in 2021 to 0.9 mb/d in 2027.
- Further, as per BP Statistical Review of World Energy 2022, India is the world's 3rd largest energy consumer, 3rd largest consumer of oil and 4th largest refiner and the fastest-growing major economy with rising energy needs.
- BP Energy Outlook and International Energy Agency estimate that India's energy demand would grow at about 3% per annum till 2040, compared to the global rate of 1%.
- Further, India is likely to account for approximately 25-28 per cent of the global energy demand growth between 2020-2040.

Way Forward:

- With a view to give a further impetus to ensure energy access, availability, affordability to citizen underpinned by energy security of the country, India is focusing on fostering new partnership in hydrocarbon sector, both through diversification of crude oil sources and through acquiring quality overseas assets.
- This dilutes dependencies on a single geographical/economic unit and increase India's strategic maneuverability.

WHY IS AVIATION SAFETY UNDER SCRUTINY?



Why in news?

- The issue of air safety has played out under intense media scrutiny following two aviation incidents.

Details:

- In the first instance, on January 2, a Japan Airlines (JAL) Airbus A350-900 collided with a Japan Coast

Guard De Havilland Canada Dash 8 after its landing, with both aircraft catching fire.

- In the second instance, on January 5, an Alaska Airlines Boeing 737 MAX 9 with 171 passengers and six crew, was departing from Portland, U.S., when a window panel 'door plug' blew out mid-air causing depressurisation.

What happened after the Boeing case?

- The incident has renewed attention on the Boeing 737 MAX's troubled flight safety record. On January 12, the Federal Aviation Administration (FAA) in the U.S. announced more "oversight on Boeing" which will be in addition to its probe into the incident.
- In its investigation, the National Transportation Safety Board (NTSB), U.S., is also focusing on the cabin pressure control system.
- The FAA has added that every Boeing 737 MAX 9 with a plug door would remain grounded till there was a thorough review. In the Alaska incident, parts of the seat next to the 'door plug' were damaged, while some other seat frames were twisted.
- India's Directorate General of Civil Aviation also reported an unidentified Indian operator of the Boeing 737 MAX 8 finding a missing washer during a maintenance inspection.
- This follows a Boeing directive in December 2023 asking 737 MAX operators to carry out checks after a loose bolt was found in the rudder control system of a 737 MAX (the airline has not been named).

What does the Airbus incident show?

- The JAL Airbus was flying from Sapporo New Chitose to Tokyo Haneda, which is the world's third busiest domestic airline route (according to aviation data). This is also the first complete hull loss of an A350.
- However, it was the survival of all the passengers on a new technology aircraft that drew attention, highlighting the importance of crew training, the critical response time of fire and rescue teams and the advances in aircraft manufacturing technology.
- In the JAL incident, as the aircraft's public announcement system malfunctioned, the cabin crew had to conduct the evacuation using megaphones and voice commands. All passengers were evacuated through three emergency exits.

What about newer aircraft technology?

- There is increasing use of composite materials in Airbus (A350) and Boeing aircraft (787 and 777), which ensure a combination of durability, strength and low weight.
- In the A350, more than half of the plane's structure was composite, with the use of advanced materials such as carbon-fibre reinforced plastic (CFRP). The JAL fire was a real world test for such an aircraft, and the forensic analysis will offer valuable technical insights to investigators and manufacturers.

- In the Boeing 787 programme, for instance, there have been computer simulation models of the behaviour of composite materials in extreme situations, but these have left structural and material experts divided. But in fire tests by the FAA in November 2007, plastic composites were shown to withstand fire much better than metal.

What are the key safety improvements?

- The FAA-governed improvements have also led to improved standards being put in place. These include: improved flammability of seat cushions adopted by the international aviation community;
 - floor proximity emergency escape path marking;
 - lavatory smoke detectors;
 - lavatory fire extinguishers;
 - halon fire extinguishers;
 - cargo compartment liners;
 - improved interior materials especially for large surface area panels to ensure reduced heat release, and smoke emissions test standards;
 - the use of 16G seats; improved access to Type 3 exits;
- cargo compartment fire detection or suppression as well as new thermal/acoustic insulation.

WHAT ARE LABOUR RULES FOR WORKERS ABROAD?



Why in news?

- The Uttar Pradesh and Haryana governments, with the help of the National Skill Development Corporation (NSDC), have started the process of recruiting about 10,000 workers to go to Israel, primarily for construction activities.
- The NSDC website describes it as a "passport to dreams abroad", and a chance to "discover new horizons in Israel".
- There are 2,000 openings for plastering workers, 2,000 for ceramic tile workers, and 3,000 each for iron bending and frame workers with monthly salaries of about ₹1.37 lakh (6,100 Israeli shekels). Screenings have started in various locations in Haryana and U.P. with the help of State governments.

Who are opposing the move?

- Trade unions have opposed this move, citing the Emigration Rules under the Emigration Act. They are planning to challenge this employment drive legally.
- As per the central trade unions such a move is against the Indian ethos of bringing back citizens from conflict zones.
- The trade union leaders alleged that the BJP-led government was using unemployment among the youth and workers to further their "politics of hate" to please Israel. Several hundreds of people, meanwhile, turned up at the screening centres in Haryana.

What do the Rules prescribe?

- Workers going to conflict zones or places without sufficient labour protections are required to register with the Ministry of External Affairs' 'e-migrate' portal.
- Passports issued under the ECR (Emigration Check Required) scheme cover workers travelling to 18 countries, including Afghanistan, Bahrain, Indonesia, Iraq, Jordan, the Kingdom of Saudi Arabia, Kuwait, Lebanon, Libya, Malaysia, Oman, Qatar, South Sudan, Sudan, Syria, Thailand, the UAE, and Yemen.
- Israel is not on this list and the 'e-migrate' system will not be used for those going to Israel despite continuing violence due to Israel's bombing of Gaza.
- The Rules say that no recruiting agent shall collect from the worker service charges more than a maximum of ₹30,000 and the service charges shall include costs of domestic travel or lodging and boarding for conducting of interviews by the recruiting agent. Here, the workers will have to pay a fee to the NSDC, pay for their flight tickets, etc, which will add up to almost ₹1 lakh.
- The unions point out that paid recruitment in a war zone facilitated by governments violates provisions of the Emigration Act. The MEA spokesperson, Randhir Jaiswal, said India is satisfied with Israel's labour standards.

What are the international practices?

- The international practices for protection of migrant workers are governed by two conventions of the International Labour Organisation: the Migration for Employment Convention (Revised), 1949 (No. 97) and Migrant Workers (Supplementary Provisions) Convention, 1975 (No. 143).
- While India has not ratified both conventions, Israel had ratified the 1949 convention in 1953.
- The 1949 convention says: "Each Member for which this Convention is in force undertakes that it will, so far as national laws and regulations permit, take all appropriate steps against misleading propaganda relating to emigration and immigration. For this purpose, it will where appropriate act in co-operation with other Members concerned."

- According to a 2017 report prepared by the ILO, international migration has grown significantly in the last two decades. The number of migrants from Asia to the Arab states has more than tripled, from 5.7 million in 1990 to 19 million in 2015.

What is the way forward?

- The global unemployment rate is set to increase in 2024 while growing social inequalities remain a concern, said the ILO's World Employment and Social Outlook: Trends 2024 report. Joblessness and the jobs gap have both fallen below pre-pandemic levels but global unemployment will rise in 2024.
- It added that many low- and middle-income countries will experience a demographic transition after 2030 and asked the countries to design sensible migration policies and skilling initiatives to support and develop local labour markets with growing populations.
- In 2019, a report of the Parliament Standing Committee on External Affairs had asked the Centre to draft a migration policy.
- The panel, then headed by MP Shashi Tharoor, said it is concerned to note that the existing institutional arrangements for the protection, safety and welfare of Indian emigrants are based on inadequate data infrastructure.

PRADHAN MANTRI SURYODAYA YOJANA



Why in news?

- Recently, the Prime Minister announced the 'Pradhan Mantri Suryodaya Yojana', a government scheme under which one crore households will get rooftop solar power systems.

Background:

- In 2014, the government launched the Rooftop Solar Programme that aimed to achieve a cumulative installed capacity of 40,000 megawatts (MW) or 40 gigawatts (GW) by 2022. However, this target couldn't be achieved. As a result, the government extended the deadline from 2022 to 2026.
- The Pradhan Mantri Suryodaya Yojana seems to be a new attempt to help reach the target of 40 GW rooftop solar capacity.

What is the Pradhan Mantri Suryodaya Yojana?

- It is a scheme that will involve installing solar power systems at rooftops for residential consumers.
- The scheme would help not only reduce electricity bills of the "poor and middle class", but also push India's goal of becoming self-reliant in the energy sector.

What is India's current solar capacity?

- According to the Ministry of New and Renewable Energy, solar power installed capacity in India has reached around 73.31 GW as of December 2023. Meanwhile, rooftop solar installed capacity is around 11.08 GW as of December 2023.
- In terms of total solar capacity, Rajasthan is at the top with 18.7 GW. Gujarat is at the second position with 10.5 GW. When it comes to rooftop solar capacity, Gujarat tops the list with 2.8 GW, followed by Maharashtra by 1.7 GW.
- The solar power has a major share in the country's current renewable energy capacity, which stands at around 180 GW.

Why is an expansion of solar energy important for India?

- India is expected to witness the largest energy demand growth of any country or region in the world over the next 30 years, according to the latest World Energy Outlook by the International Energy Agency (IEA).
- To meet this demand, the country would need a reliable source of energy and it can't be just coal plants. Although India has doubled down on its coal production in recent years, it also aims to reach 500 GW of renewable energy capacity by 2030.
- Therefore, it is essential to expand solar power capacity, the country has increased it from less than 10 MW in 2010 to 70.10 GW in 2023.

What is the Rooftop Solar Programme?

- Launched in 2014, the scheme aims to expand India's rooftop solar installed capacity in the residential sector by providing Central Financial Assistance, the financial assistance to the eligible projects as per MNRE Guidelines and incentives to DISCOMS (distribution companies).
- The programme's goal is to increase rooftop solar installed capacity to 40 GW by March 2026 and it is currently in its second phase. Owing to the scheme, the country's rooftop solar has increased from 1.8 GW as of March 2019 to 10.4 GW as of November 2023.
- A consumer can avail of benefits of the scheme through DISCOM tendered projects or through the National Portal.
- On the National Portal, the consumer has the choice to select any vendor and choose the brand and quality/efficiency of solar equipment. The DISCOMS role is

limited to issuing of technical feasibility approval, installation of net-meter and inspect the system.

- After installation and inspection of the system, the subsidy is sent directly to the bank account of the consumer.

Income generation:

- Moreover, surplus solar power units generated from the rooftop solar plant can be exported to the grid as per the metering provisions issued by respective SERCs (State Electricity Regulatory Commissions)/JERCs (Joint Electricity Regulatory Commission). The consumer can receive monetary benefits for the surplus exported power as per the prevailing regulations.

SECURITY

UNDERSTANDING THE PEACE PACT WITH ULFA



Why in news?

- The pro-talks faction of the United Liberation Front of Assam (ULFA) signed a tripartite peace deal with the Centre and the Assam government on December 29, 2023.
- The memorandum of settlement has several clauses for accelerating the State's development and safeguarding the land and political rights of indigenous communities but a worry remains in the form of the anti-talks faction headed by Paresh Baruah.

How was the ULFA formed?

- The ULFA is a by-product of the anti-foreigners Assam Agitation that began in 1979 and ended with the signing of the Assam Accord in August 1985.
- The fear that the Assamese and other indigenous communities would be pushed out of their own backyard by "illegal immigrants" (people from Bangladesh) one day had triggered the agitation.
- While social organisations and students' bodies chose the path of agitation, a group of radicals, including Arabinda Rajkhowa, Anup Chetia, and Paresh Baruah formed the ULFA on April 7, 1979, to launch an armed struggle with the objective of establishing a sovereign Assam.

- The group took a decade to recruit and train its members in Myanmar, China, and Pakistan before striking with a series of abductions and executions.
- The government responded in 1990 with an offensive codenamed Operation Bajrang and banned the ULFA. Assam was declared a disturbed area with the imposition of the Armed Forces (Special Powers) Act.

When did the peace process start?

- Counter-insurgency operations led to the arrest of 1,221 ULFA members in the early 1990s. With support from terror groups such as Harkat-ul-Jihad-e-Islami and Pakistan's Inter-Services Intelligence, the ULFA hardliners set up camps in Bangladesh and Bhutan.
- A military offensive by Bhutan in 2003 and the Sheikh Hasina-led Awami League's return to power in Bangladesh in 2009 saw most of the ULFA members being flushed out from these countries.
- In 2005, the ULFA raised hopes of peace when it formed an 11-member People's Consultative Group only to backtrack and unleash a fresh phase of terror.
- After falling in the net of the security forces in India in 2009, the leaders of the Rajkhowa-led faction signed a ceasefire agreement with the Centre in September 2011. Opposed to talks, Baruah "expelled" Rajkhowa from the ULFA in 2012.
- In April 2013, the anti-talks group was renamed ULFA (Independent). The pro-talks group signed the peace accord 12 years after the agreement to suspend subversive operations.

What does the peace accord offer?

- The ULFA has agreed to renounce violence, disarm, disband the armed organisation, vacate their occupied camps, and participate in peaceful democratic process established by the law.
- Marking a shift toward non-violence, it aims to ensure the integrity of the country contrary to what the ULFA had initially demanded.
- The Ministry of Home Affairs will make a time-bound programme to fulfil the demands of the outfit and a committee would be formed for its monitoring.

Key Highlights:

- The pact underlines a comprehensive package entailing an investment of ₹1.5 lakh crore for the all-round development of Assam. The most significant part of the accord is the commitment to address the political demands of the ULFA.
- These include maintaining the territorial integrity of Assam through amicable settlement of boundary disputes with neighbouring States in the Northeast and continuation of the "guidelines and methodology" adopted for the delimitation exercise conducted in 2023 in future delimitation processes.
- The pact envisages ensuring maximum representation for indigenous communities in the

- 126-member Assam Assembly by keeping non-original inhabitants, primarily migrant Muslims, out.
- The 2023 delimitation is said to have made it impossible for non-indigenous communities to contest 106 of these seats.
- Apart from the legislative safeguard, the pact seeks exemption for Assam from Section 3 of the Citizenship Act of 1955 dealing with people who have renounced Indian citizenship or whose citizenship has been terminated, to conditionally stop people of one constituency from being registered in another, and prepare an error-free National Register of Citizens, whose updated complete draft had put 19.06 lakh people out of 3.3 crore applicants on the rejection list.

What are the challenges ahead?

- After the signing of the accord, Chief Minister said 90% of extremism in the State was over. Conflict specialists say the pact, provided the government shows its intent to implement the clauses, was a step in the right direction but lasting peace would be elusive unless Baruah and some 200 fighters of his ULFA (I) group talk truce.
- The ULFA (I) operates from hideouts in the Sagaing Division of Myanmar. Baruah, believed to be based on the Myanmar-China border, has repeatedly said talks with the "Indian occupational forces" would be meaningless without discussing the sovereignty of Assam.

NAVY GETS ITS FIRST MALE DRONE MADE BY ADANI



Why in news?

- The Indian Navy recently took delivery of its first India-made Medium Altitude Long Endurance (MALE) drone, acquired under emergency procurement mechanism, to augment India's ability to keep a close eye on the waters of the Indian Ocean.

Details:

- It is manufactured by Adani Defence and Aerospace in partnership with the Israeli firm Elbit, in Hyderabad.
- The Drishti 10 StarLiner, with an endurance of 36 hours, satellite connectivity and the ability to carry a payload of 450 kg, is the Indian version of the original Hermes StarLiner.

- The UAV will fly from Hyderabad to Porbandar in Gujarat to be pressed into naval maritime operations.
- Both the Navy and the Army have gone in for two drones each, with a service ceiling of 30,000 feet, under emergency procurement which allows them to bypass tardy bureaucratic procedures for deals up to Rs 300 crore.

Salient features:

- With state-of-the-art sensors, enhanced endurance, advanced communication capabilities as well as new-age technologies like automatic take-off and landing (ATOL), Drishti would be a potent force multiplier, adding more capability and credibility to Intelligence, Surveillance and Reconnaissance (ISR) missions across the Indian Ocean region.
- The versatility and flexibility offered through modularity and mobility of ground support equipment would enable us to operate it from any naval air stations across "Bharat".
- The drone is qualified for flight in civilian non-segregated airspace and in adverse weather conditions thanks to its unique and unlimited deicing mechanism.
- The drone also has Starliner features over-the-horizon, persistent multi-mission, multi-sensor capabilities with a class-leading payload carrying capacity.
- The Navy currently operates tactical drones in addition to the four High Altitude Long Endurance (HALE) drones called 'Sea Guardians'.

Heron drones:

- The Army, which has procured a number of drones of varying capabilities, has already bought four Satellite Communication-enabled Israeli Heron Mark-II drones.
- The Indian military plans to upgrade the existing fleet of Heron Mark-I with similar capabilities that will allow it to operate them with longer endurance and capabilities, as reported earlier.
- The Herons currently have an endurance of about 24 hours and can transmit back live video feed and images within a range of about 200-250 km. With satellite-link, they will have almost unlimited range of transmission and can be fully exploited to their endurance capabilities.

MQ-9B drones:

- Meanwhile, the Army, Navy and the Air Force are looking at the acquisition of 31 HALE (MQ-9B) drones which will be inducted into the Indian military over the next three-four years.
- Of the 31, Navy will get 15 MQ-9B drones in maritime and anti-submarine warfare kits, while the Army and the Indian Air Force (IAF) will get eight each of the land version.

ENVIRONMENT

SNOW LEOPARD NOW NATIONAL SYMBOL OF KYRGYZSTAN



Why in news?

- The snow leopard, symbol of High Asia with its host of mountain ranges stretching from the Altai to the Himalayas, is now the national symbol of Kyrgyzstan, a former Soviet Republic in Central Asia.
- Sadyr Zhaparov, the President of Kyrgyzstan (which won its independence after the breakup of the Soviet Union in 1991), signed a decree on December 30, 2023 to this effect.

Highlights of the decree:

- The snow leopard was an important symbol of Kyrgyz culture. It features in the story of Manas, the Kyrgyz folk hero, as related in the Epic of Manas.
- The snow leopard is not only a symbol of natural wealth and cultural prosperity, but also an indicator of the stability and health of the mountain ecosystem, which occupies 1/3 of the global territory.
- The loss of snow leopards in the wild will lead to the risk of disturbing the fragile ecological balance, which will have a detrimental impact on various animal species and on humans.
- Ministries and agencies of the Kyrgyz Republic will henceforth collaborate to promote the snow leopard, organise protective measures, attract green investments, and utilise the symbol in promoting responsible tourism.

Mascot of Third Pole:

- There is critical need to make the snow leopard the mascot of climate adaptation in the 'Third Pole'.
- Inner Asia comprises of mountain ranges such as the Altai, Tian Shan, Nan Shan, Kunlun Shan, Pamir, Karakorum, Hindu Kush, and of course, the Tibetan Plateau and the Himalayas.
- This region is home to most of the snow and ice on Earth outside the poles. From this region, at least 15 rivers fan out in every direction across the Asian continent.
- This 'Water Tower of Asia' provides essential ecosystem services, it provides clean water for a

third of the world's population. It is estimated to be warming at nearly two times the average rate of warming in the Northern Hemisphere.

Conservation:

- Snow leopard conservation received a boost a decade ago with the Bishkek Declaration on Snow Leopard Protection being unanimously adopted at the World Snow Leopard Conservation Forum in 2013.
- The GSLEP was subsequently initiated with the support of representatives from 12 snow leopard range countries (which includes India) and the international environmental community.
- The Global Snow Leopard and Ecosystem Protection Programme (GSLEP), an alliance of 12 snow leopard range countries, multi-lateral institutions, NGOs, scientists and local communities, is working to save the species.

AFRICAN RAPTOR POPULATION DECLINES 88 PERCENT IN 40 YEARS, MANY CROSSING IUCN THRESHOLD: REPORT



Why in news?

- Raptors in Africa have experienced a widespread decline of about 88 per cent in the past 40 years, a new study revealed.

Risk of global extinction:

- Scientists said that 37 of the 42 species examined by them have seen a decline in their population. Out of the total, 29 (69 per cent) have seen a drop in population over three generation lengths.
- The generation length criteria is used by the International Union for Conservation of Nature (IUCN) to identify species which are at the risk of global extinction.
- Two-third of the studied population from 1969-1995 and 2000-2020 across Africa show strong evidence to be globally threatened.

Key Highlights:

- The researchers studying 27 species in multiple regions of Africa found that 24 of them (89 per cent) exceeded the decline threshold.
- As many as 13 of these species are enlisted in the Least Concern category, raising the issue of reassessing their status.

- Six of the species that is secretary bird (*Sagittarius serpentarius*), lappet-faced vulture (*Torgos tracheliotos*), bateleur, tawny eagle (*Aquila rapax*), steppe eagle (*A. nipalensis*) and martial eagle (*Polemaetus bellicosus*) are endemic or near endemic to Africa who have declined rapidly than the threshold rates, a method used by IUCN to define threat status.
- Three additional species showing steep declines are augur buzzard (*Buteo augur*), Dickinson's kestrel (*Falco dickinsoni*) and Beaudouin's snake-eagle (*Circaetus beaudouini*).
- The latter is of particular concern, having declined by 80-85 per cent over three generation lengths within a large (and probably representative) portion of its global breeding range.

Threats:

- The raptors are seeing rapid decline in population owing to loss of habitat, loss of prey-base and anthropogenic disturbances.
- The study stated that the human population in the continent has increased rapidly over the past 60 years leading to high expansion of land conversion and habitat degradation, threatening the raptors.
- Annually, nearly five million hectares of forest and non-forest natural vegetation was lost in sub-Saharan Africa. The declines were more prominent in West Africa where the situation was worse than sub-Saharan Africa.
- Corruption, regional levels of poverty, lack of funding and mismanagement led to adverse effects on conservation of species in protected areas of west and central Africa.
- Moreover, the rate of agricultural expansion was recorded to be three time more in the West Africa compared with the rest of Africa between 1970s and 2000s.
- The combined effect has resulted birds of prey increasingly relying on Protected Areas (PA), which amount to 14 per cent of the land. The study warns that if the trend continues, the pressure on PAs will increase.
- Apart from loss of habitat other threats of concern to the avian apex predators, scavengers and miso-predators include prey-base depletion, unintentional poisoning, killing by poisoning, shooting, trapping, electrocution and collisions with human built energy infrastructure.
- They said that raptors which breed slow also face difficult in recovering the rapidly lost population.

Significance of raptors:

- It observed that depletion in predator population can trigger cascading effects on its prey populations and disrupt the ecosystem functioning.
- Raptors provide crucial ecosystem services such as rapid removal of carcasses through consumption and

decreasing the risks of spread of zoonotic diseases to human populations.

- The analysis of African raptors seeing steeper annual declines compared to smaller species reflect pattern of extinction risks observed similar to terrestrial mammalian predators.
- The risks to large bodied species multiply due to biological traits such as low population density, low annual fecundity and delayed maturity.

MICROPLASTIC MENACE IN ANTARCTICA, UN TO ANALYSE PENGUIN DROPPINGS, WATER



Why in news?

- Scientists from the International Atomic Energy Agency (IAEA) and the Argentine Antarctic Institute (IAA) have embarked on an expedition to Antarctica to investigate the extent of microplastic pollution in this remote region.

Details:

- Utilizing nuclear science techniques, the team aims to analyse samples from the icy waters, seabed sediment, and even penguin droppings to gain insights into the presence and origins of these pollutants.
- This initiative is part of the IAEA's NUTEC Plastics Initiative, which has been examining microplastic pollution across various countries. The study in Antarctica is particularly significant due to the continent's crucial role in the planet's overall health.
- The investigation also seeks to determine whether the microplastics found in Antarctica have been transported by sea currents from other parts of the world or if they originate from local sources.
- This distinction is critical for developing effective measures to address the issue.

Microplastics:

- Microplastics, defined as particles smaller than 5 millimeters, have become a pervasive environmental issue, with their harmful effects extending to even the most isolated corners of the Earth.
- These tiny particles are often ingested by wildlife, leading to the accumulation of toxins within organisms and potentially causing diseases.

Why it matters?

- The presence of microplastics in Antarctica is a stark reminder of the global scale of plastic pollution. Since plastics were introduced to the market, an estimated 7 billion tons have been discarded into the environment, with a significant portion ending up in marine ecosystems.
- The findings from this study are expected to contribute to the urgent need for policies and actions to mitigate the impact of microplastics on the environment and wildlife, not only in Antarctica but globally.

Way Forward:

- As the world grapples with the challenges of pollution, this collaborative effort between the IAEA and IAA highlights the importance of international cooperation in preserving the pristine nature of Antarctica and protecting the health of our planet.

MAJORITY OF INDIAN CITIES FAR FROM CLEAN AIR TARGET, SAYS STUDY



Why in news?

- The Centre's ambitious attempt to improve air quality in some of India's most polluted cities suggests that a majority of Indian cities are far from making significant progress.
- In 49 cities whose particulate matter numbers were consistently available for five years, 27 showed a decline in PM 2.5 while only four had met or exceeded the targeted decline, according to an analysis by Respirer Living Sciences and Climate Trends.

National Clean Air Programme (NCAP):

- The stated goal of the ₹9,631-crore National Clean Air Programme (NCAP) is to reduce average particulate matter concentrations 40% by 2026 (compared to 2017) in 131 cities.
- When the programme was initiated, the aim was to cut pollution 20-40% by 2024 in these cities but this goalpost was later shifted to 2026.

Key Findings:

- While the deadline is still three years away, some of India's biggest cities are reporting marginal declines or even increasing pollution loads. Delhi, for instance, has seen average, annual PM 2.5 levels decline only

- 5.9%. Navi Mumbai, a suburb of Mumbai, has seen a 46% rise in PM 2.5 levels.
- Among the cities that showed a sharp decline in PM 2.5 from 2019-2023 were Varanasi, with a 72% average reduction in PM 2.5 levels and 69% reduction in PM 10 levels.

Monitoring stations:

- Another factor that significantly influences annual concentrations of pollutants in a city is the number and spread of continuous ambient air quality monitors.
- While cities such as Mumbai and Delhi have several such stations spread across the breadth of the cities to account for pollution in diverse areas, most Indian cities have only a handful.
- Only four of the 92 cities part of the analysis have more than 10 such stations.
- Varanasi in 2019 had only one such station, which only worked 24% of the time whereas by 2024 it has four stations that have been operational all days. Majority of cities have less than five stations.

Way Forward:

- The National Clean Air Programme has made noteworthy progress, witnessing notable reductions in PM 2.5 and PM 10 levels in top polluted cities.
- Despite these positive strides, persistent challenges exist, with some urban areas facing an uptick in pollution concentrations.

SURFACE IRRIGATION MAY ENCOURAGE MONOCROPPING, EVIDENCE FROM TELANGANA HOLDS LESSONS FOR INDIA



Why in news?

- Farmers are more likely to move towards monocropping if farms receive a higher level of surface irrigation, as opposed to irrigation facilities achieved through projects that increase the groundwater table, a recent study on cropping patterns and trends in Telangana showed.

Surface irrigation:

- Surface irrigation is a traditional method in which water moves over the land, depending on the gravitational gradient.

- When water is applied to the field, it advances across the surface until the water extends over the entire area. The drawback of this irrigation method is inefficient usage and wastage of water.
- Results from the research indicate that the presence of new irrigation facilities, achieved through projects that increase the groundwater table, increases the likelihood of farm households adopting crop diversification compared to those with existing irrigation facilities.
- This suggests that surface irrigation tends to encourage the adoption of monocrops, especially paddy.

Improved irrigation facilities vs surface irrigation:

- Insights from focus group discussions revealed that small farmers cultivate a higher variety of crops when provided with access to irrigation through groundwater.
- Meanwhile, it was also found that providing farm households with new irrigation facilities aimed at improving the groundwater table significantly enhances farm profits, compared to those in regions relying on surface irrigation.
- In newly irrigated regions, the introduction of improved irrigation facilities has resulted in a 21 per cent increase in farm incomes compared to those in regions utilising surface irrigation.
- Although surface irrigation may initially seem like a more lucrative option for achieving higher returns, it carries potential environmental challenges, including soil fertility loss due to waterlogging and salinity. In addition, continuous access to irrigation may contribute to the development of monoculture.

Why it matters?

- The findings hold significance for breaking the monocropping pattern followed by many farmers across India to enhance productivity.
- Monocropping has led to nutrient soil deficiency and a decrease in resource-use efficiency. In states like Punjab, Haryana and Telangana, the monocropping of paddy has led to several problems, including an alarming decline in groundwater.
- In October 2023, a report from United Nations University-Institute for Environment and Human Security, warned that India was close to reaching its groundwater depletion tipping point. More research has indicated that the rate of depletion of groundwater in India during 2041-2080 will be thrice the current rate with global warming.

Case of Telangana:

- Telangana, where the study was conducted, is one of the largest producers of paddy in the country. The observations of cropping patterns and trends in the state indicated a decline in diversified cropping systems over the years, attributable to different factors

such as improved access to irrigation facilities and market policies favouring the cultivation of cereals. The state-level crop diversification index has been consistently low, standing at 0.27 over decades.

- Farmers tend to move towards conventional and monocropping practices over the years across the state, except in some patches of rain-fed regions, the findings showed.
- The proportion of cultivation of major cereals, commercial crops, fruits and vegetables significantly increased from 1966 to 2017, while that of pulses, oilseeds and millets significantly decreased during the same period.

Characteristics affecting crop choices:

- Farmers make decisions regarding the cultivation of a specific crop based on the expected benefits derived from its cultivation and the constraints faced by their households (adopters).
- Additionally, the decision to cultivate a single crop (monocrop) or a set of crops (crop diversification) was based on the anticipation that the expected benefits from a specific crop surpass that of another set of crops or its associated benefits.
- These discussions highlighted that the minimum support price also plays a pivotal role in choosing a crop. Other characteristics which affect crop choices were agricultural implements and market access variables such as road connectivity and distance to the nearest city.

MNRE LAUNCHES SCHEME TO INCENTIVISE PRODUCTION OF GREEN HYDROGEN



Why in news?

- The Union Ministry of New and Renewable Energy (MNRE) has recently published guidelines and incentives to promote the procurement of green hydrogen as part of the National Green Hydrogen Mission.

SIGHT Programme:

- Under the mission, Rs 17,490 crore has been set aside for the Strategic Interventions for Green Hydrogen Transition (SIGHT) programme, to bolster domestic electrolyser manufacturing and green hydrogen

production. These incentives are designed to facilitate cost reduction and rapid expansion.

- Implemented under Mode-2B, a system adopted by the MNRE for the SIGHT scheme, this approach involves aggregating demand and soliciting bids for green hydrogen and its derivatives at the lowest cost through a competitive selection process.
- Tranche I of Mode 2B offers a bidding capacity of 200,000 million tonnes per annum.

Execution of scheme:

- The scheme's execution will be entrusted to agencies nominated by the Union Ministry of Petroleum and Natural Gas (MoPNG), primarily oil and gas companies, guided by the Centre for High Technology (CHT).
- Each oil and gas entity will seek bids at the most competitive rates for either a single refinery or multiple refineries.
- CHT will assume responsibility for providing secretarial, managerial and implementation support, as well as fulfilling other responsibilities assigned by MoPNG. Green hydrogen is essential for removing sulfur content in crude oil to produce petrol and diesel.

Background:

- Indian Oil Corporation announced its plan in 2023 to convert 50 per cent of its grey hydrogen to green hydrogen by 2030 by establishing green hydrogen plants in all its refineries.
- Similarly, Hindustan Petroleum Corporation is reportedly constructing a 370 tonnes per annum green hydrogen plant at its Visakhapatnam refinery.

Incentives:

- To qualify for incentives under the scheme, bidders must meet the criteria outlined in the 'National Green Hydrogen Standard' as notified by MNRE.
- The scheme offers a direct incentive over three years from the beginning of production and supply, with rates of Rs 50 / kilogramme of green hydrogen in the first year, Rs 40 / kg in the second year and Rs 30 / kg during the third year.

Monitoring committee:

- A scheme monitoring committee, co-chaired by the secretary of MoPNG, secretary of the MNRE, mission director of the National Green Hydrogen Mission, and other experts, will periodically review the implementation status and performance of capacities awarded or established under the scheme.
- The committee will also facilitate and recommend measures to address challenges.

Caution:

- While countries worldwide are aggressively pursuing green hydrogen to combat emissions, it comes with the risk of greenwashing.
- Environmental organisations have cautioned about potential land-use and water conflicts arising from

the significant land and water resources required for green hydrogen production.

RAINFALL RISING IN OVER HALF OF INDIA'S SUB-DISTRICTS, SAYS FOUR-DECADE STUDY



Why in news?

- Rainfall is increasing in more than half of India's 4,400-odd tehsils or sub-districts, says a granular analysis of changes in the Indian monsoon, conducted for the first time at the tehsil level. While 55% of tehsils have seen a rise in rainfall, about 11% have experienced a fall.
- The study authored by the Council on Energy, Environment and Water (CEEW), analyses high-resolution meteorological data spanning four decades, from 1982 to 2022, which has been recorded by the India Meteorological Department (IMD).

Concerns:

- The decrease occurred largely during the critical southwest monsoon. In fact, of the tehsils experiencing lower rainfall, about 68% saw reduced rainfall in all the monsoon months from June to September, while 87% showed a decline during the initial monsoon months of June and July, which are crucial for the sowing of kharif crops.
- Most of these tehsils are in the Indo-Gangetic plains, which contribute to more than half of India's agricultural production as well as in northeastern India and the Indian Himalayan region.

Key Highlights:

- India collectively experienced 29 "normal", eight "above-normal", and three "below-normal" monsoon years during that period. But an analysis at the district level reveals that 30% of India's districts witnessed several more years of deficient rainfall and 38% saw many years of excessive rainfall.
- In fact, 23 districts including New Delhi, Bengaluru, Nilgiris, Jaipur, Kutch, and Indore experienced both extremes, with a higher number of deficient and excessive rainfall years.
- Several tehsils in Rajasthan, Gujarat, central Maharashtra and parts of Tamil Nadu, which have historically been dry regions, have also been getting

wetter, tying in with the finding that a majority of tehsils have been reporting increasing rainfall.

Erratic rain patterns:

- Rainfall from the northeast monsoon, which sets in during October, November and December, primarily in peninsular India, has increased by more than 10% over the past decade (2012-2022) in approximately 80% of tehsils in Tamil Nadu, 44% in Telangana, and 39% in Andhra Pradesh, respectively.
- The southwest monsoon accounts for nearly 76% of India's annual rainfall, with about 11% coming from the northeast monsoon.
- While the remaining Indian States are usually dry during this period, several tehsils of Maharashtra and Goa on the west and Odisha and West Bengal on the east coast have been reporting increasing rainfall during winter. This increase could partly be attributed to cyclonic activity in the Arabian Sea and the Bay of Bengal.

Way Forward:

- As India readies for the Union Budget, it will be crucial to focus on future-proofing the economy against increasingly erratic rainfall patterns. The monsoons impact the food we eat, the water we drink and also our energy transition.

URBANISATION IN BHUBANESWAR IMPACTS WINTER TEMPERATURES

Smaller cities are warming up due to urbanisation

At COP-28, the importance and role of cities in achieving climate change mitigation and adaptation targets was highlighted

- The built-up area in Bhubaneswar has increased by about 166% between 2004 and 2015
- Satellite-based observations show about 1°C increase in nighttime temperature
- Bhubaneswar has warmed at a faster rate — about 0.58°C increase in temperature in the last two decades
- Almost 60% of the overall warming observed over the city is due to local activities/changes
- In addition to warming due to climate change, heat trapped by the concrete and asphalt materials has led to an increase in city temperature
- Decreased evapotranspiration due to natural surfaces being replaced with artificial impervious surfaces also contributes to warming
- Dispersion of heat from the city is reduced in the eastern fringes due to drop in wind speed by about 0.2 metres per second



Catching up: Bhubaneswar is warming up due to rapid urbanisation in recent times

Context:

- More than half of the world's population now resides in the cities and are thus vulnerable to urban climate change such as increased heat stress and extremes.
- Globally, cities contribute to more than 80% of the global GDP and 75% of all greenhouse gases/carbon emissions. Thus, they are both contributors to climate change and also potential agents for tackling it. However, their representation in Nationally Determined Contributions (NDCs) and National Adaptation Plans is inadequate.

SDG 11:

- The inclusion of the 11th sustainable development goal (SDG) exclusively focusing on cities and the

formation of groups like the U-20 under the G-20 umbrella have acknowledged the need for city-level action plans.

- The ministerial meeting on urbanisation and climate change at COP-28 stressed the importance and role of cities in achieving climate change mitigation and adaptation targets. These initiatives show the importance attached to cities and their role in global affairs including climate change mitigation and adaptation.

Case of Bhubaneswar:

- Bhubaneswar, a tier-II city in the eastern State of Odisha, is rapidly urbanising in recent times. For example, the built-up area in the city increased by about 166% during the period 2004-2015.
- Studies using satellite-based observations showed a nighttime heat dome over the city with an elevated temperature (about 1C). Additionally, Bhubaneswar has warmed at a faster rate, with almost about 0.68C enhancement in the last two decades.
- Such warming is particularly higher in the newly urbanising areas in the periphery of the city, experiencing almost doubled warming over the same period.

Computer-based simulations:

- As part of a larger effort in implementing the cities digital twin at the School of Earth Ocean and Climate Sciences at IIT Bhubaneswar, computer-based simulations were carried out to mimic the Bhubaneswar urban growth and hence change in the micro-climate and their relation to different factors such as climate change, city expansion, change in vegetation cover, etc.
- It was quantified that almost 60% of the overall warming observed over the city is due to local activities/changes.

Key observations:

- In addition to the warming due to climate change, there is additional warming due to the trapping of heat by the concrete and asphalt materials used to build the city. The decreased evapotranspiration due to the replacement of natural surfaces with artificial impervious surfaces is also contributing to the observed warming.
- The inclusion of a minimalistic 3-D structure of the city within these simulations for winter time showed enhanced warming of almost 0.4C in the eastern lowland regions of the city mostly as a consequence of topographical asymmetry.
- There was further reduction in the wind speeds by about 0.2 metres per second, in the eastern fringes of the city, limiting dispersion of heat.
- In contrast, in the western region, the influence is nullified, possibly due to lower surface specific humidity affecting longwave radiation in a higher terrain setting.

- Both the terrain and local microclimate play a significant role in shaping winter urban surface temperatures, highlighting the complex interplay between urbanisation and climate. Urban planning to mitigate or adapt to these changes require systematic scientific explorations.

Impact:

- These changes are expected to further modify the spatial pattern, intensity, and duration of rainfall events with implication to urban floods. These changes are also expected to modify the dispersion characteristics of air pollution within the city.
- Thus the implementation of a digital twin for the city will help in the experimentation of different mitigation strategies like cool roofs, highly reflective pavements, and blue-green infrastructure (water bodies and green spaces).
- Substantial changes associated with urbanisation even for such a small tier-II city highlights the potential for local scale mitigation efforts to control the observed warming and their subsequent effects.

Way Forward:

- The ever-increasing population load and enhanced dependence on city resources will continue in the future, amplifying the hovering clouds of vulnerability/danger over the cities in the absence of city specific science driven strategies.
- Thus, building climate-resilient smart cities is important to ensure the health, safety, and comfort of the ever-increasing urban population.
- Unlike the saturated big metro/mega cities, smaller cities have a larger scope for planned growth and expansion and, hence, the potential to shift their growth trajectory towards sustainability.
- Therefore, as the harbingers of future climate change, comprehensive city-scale climate action plans supported by science to mitigate and adapt to the impacts of urbanisation and climate change are the need of the hour.

WHAT ARE ODISHA FAMOUS BLACK TIGERS, AND WHY IS THE STATE PLANNING A SAFARI AROUND THEM?



Why in news?

- Odisha will start a melanistic tiger safari near Similipal Tiger Reserve (STR). The safari will be the first of its kind anywhere in the world, and the Chief Minister invited tourists to see “the rare and majestic” melanistic tiger species “found only in Odisha”.
- The state government’s plan has received in-principle approval from the technical committee of the National Tiger Conservation Authority (NTCA).
- As of now, the safari is likely to be ready for visitors by October 2024.

What are black tigers or melanistic tigers?

- Melanism is a genetic condition in which an increased production of melanin, a substance in the skin that produces hair, eye, and skin pigmentation, results in black (or nearly black) skin, feathers, or hair in an animal.
- Many royal Bengal tigers of Similipal belong to a unique lineage with higher-than-normal levels of melanin, which gives them black and yellow interspersed stripes on their coats. These tigers are not entirely black, and are therefore more accurately described as being pseudo-melanistic.
- The STR, which sprawls over 2,750 square km in Odisha’s Mayurbhanj district adjoining Jharkhand and West Bengal, is Asia’s second largest biosphere, and the country’s only wild habitat for melanistic royal Bengal tigers.

What makes tigers (pseudo) melanistic?

- A single mutation in the gene Transmembrane Aminopeptidase Q (Taqppep) causes black tigers to develop stripes that seem to have broadened or spread into the tawny background.
- Genetic analyses of other tiger populations in India and computer simulations suggest that the Similipal black tigers may have arisen from a very small founding population of tigers, and are inbred. The STR cats live isolated from other tigers, because of which they breed among themselves.
- Approximately 37% of tigers in the Similipal Tiger Reserve are pseudomelanistic, characterized by wide, merged stripes. Camera trap data across the tiger range revealed the presence of pseudomelanistic tigers only in Similipal.

How many melanistic tigers are there in STR?

- Melanistic tigers have been recorded only in the Similipal Tiger Reserve in Odisha.
- As per the 2022 cycle of the All India Tiger Estimation, 16 individuals were recorded at Similipal Tiger Reserve, out of which 10 were melanistic.
- The state government’s ongoing tiger survey, however, suggests that the number of royal Bengal tigers in STR is more than what has been mentioned in the NTCA report. The state government’s report will be released soon.

What is Odisha’s plan for the melanistic tiger safari?

- Around 200 hectares of land along the Dhanbad-Balasore National Highway-18 has been identified for the proposed safari. The site is about 15 km from the STR, and its landscape matches that of Similipal.
- About 100 hectares will be the display area of the park, and the rest will be used to build veterinary care facilities, including a rescue centre, staff infrastructure, and visitors’ amenities. Initially, three melanistic tigers from the Nandankanan zoo north of Bhubaneswar, and rescued/ orphaned tigers who are not fit for wild but fit for display, will be housed in the safari in an open enclosure.

Why has Odisha come up with this plan?

- The safari aims to allow wildlife conservationists, researchers, and enthusiasts to see the rare big cats from up close, and to create awareness about the need for their conservation.
- The sighting of tigers is difficult in STR because of its vast area, and the safari has been proposed as an added attraction for visitors to Similipal.
- An NTCA committee will visit the proposed site to carry out a feasibility study before final clearance is given to the project.
- The state government will also have to obtain other statutory clearances, including approval from the Central Zoo Authority, a body under the Environment Ministry that has oversight over zoos in the country.

MOUNTAIN GOATS IN ALPS ARE TURNING NOCTURNAL DUE TO CLIMATE IMPACT



Why in news?

- Warmer temperatures caused by climate change are changing the lifestyles of mountain goats in the European Alps.
- Alpine ibexes (Capra ibex), a mountain goat species, are forced to change their diurnal habits to nocturnal to avoid hot days. This lifestyle shift is making them vulnerable to predators such as wolves, hindering their movement and may lead to eventual population decline.

Details:

- The researchers from the University of Sassari and University of Ferrara in Italy studied 47 ibexes over a span of 14 years.
- The study is titled 'Seeking temporal refugia to heat stress: increasing nocturnal activity despite predation risk'.
- The goats were tracked between 2006 and 2019 using motion sensors and global positioning system trackers.

Key Findings:

- The ibexes' nocturnal activities increased during warmer days and brighter nights due to moon illuminance, the researchers noted.
- Migration to favourable areas can be hindered by the widespread presence of humans or the landscape structure. In such cases, animals may maintain their current distribution range and optimal thermal niche by modifying their ecological niche in the temporal dimension, i.e. their daily activity rhythms.
- The animals do this to achieve energy balance and efficient heat dissipation due to the cooler evening hours.
- Males and females were active during nocturnal hours, but with females less active when accompanied by a kid. However, ibex activity was considerably higher in areas having the presence of nocturnal predators.

Shift to nocturnal lifestyle:

- The shift in behavioural pattern is the primary evidence stating that animals are avoiding heat stress and adopting nocturnal activity and, in the process, increasing predation risks.
- Apart from climate change, other pressures such as human activities, urban development, agriculture, hunting and others are also driving global increase in nocturnal activity of mammal species.
- However, a mismatch between animal adaptations and environmental conditions may occur due to a shift to a nocturnal lifestyle, which may impact the animals in the long run. The change in activity time may disrupt inter-related aspects such as competition and parasitism.

Conclusion:

- This shift towards nocturnality may facilitate animal adaptations to anthropogenic global change; on the other hand, it may bring negative consequences at individual, population and community levels.
- When active at night, diurnally adapted mammals may suffer from reduced foraging efficiency, weakened antipredator behaviours, restricted movement capacity, and ultimately reduced reproduction and survival rates.
- Such changes may further hinder humans' ability to detect animals for population estimates, affecting conservation planning.

SCIENCE & TECHNOLOGY**FROM THE MOON TO EUROPA, SIX SPACE MISSIONS TO BE EXCITED FOR IN 2024****Why in news?**

- The year 2023 proved to be an important one for space missions, with NASA's OSIRIS-REx mission returning a sample from an asteroid and India's Chandrayaan-3 mission exploring the lunar South Pole region, and 2024 is shaping up to be another exciting year for space exploration.
- Several new missions under NASA's Artemis plan and Commercial Lunar Payload Services initiative will target the moon.
- The latter half of the year will feature several exciting launches, with the launch of the Martian Moons eXploration mission in September, Europa Clipper and Hera in October and Artemis II and VIPER to the moon in November.

Europa Clipper:

- NASA will launch Europa Clipper, which will explore one of Jupiter's largest moons, Europa.
- Europa is slightly smaller than the earth's moon, with a surface made of ice. Beneath its icy shell, Europa likely harbours a saltwater ocean, which scientists expect contains over twice as much water as all the oceans here on Earth combined.
- With Europa Clipper, scientists want to investigate whether Europa's ocean could be a suitable habitat for extraterrestrial life.
- The mission plans to do this by flying past Europa nearly 50 times to study the moon's icy shell, its surface's geology and its subsurface ocean. The mission will also look for active geysers spewing out from Europa.
- This mission will change the game for scientists hoping to understand ocean worlds like Europa.
- The launch window opens October 10, 2024, and lasts 21 days. The spacecraft will launch on a SpaceX Falcon Heavy rocket and arrive at the Jupiter system in 2030.

Artemis II launch:

- The Artemis programme, named after Apollo's twin sister in Greek mythology, is NASA's plan to go back to the moon.
- It will send humans to the moon for the first time since 1972, including the first woman and the first person of color.
- Artemis also includes plans for a longer-term, sustained presence in space that will prepare NASA for eventually sending people even farther to Mars.
- Artemis II is the first crewed step in this plan, with four astronauts planned to be on board during the 10-day mission.
- The mission builds upon Artemis I, which sent an uncrewed capsule into orbit around the moon in late 2022.
- Artemis II will put the astronauts into orbit around the Moon before returning them home. It is currently planned for launch as early as November 2024. But there is a chance it will get pushed back to 2025, depending on whether all the necessary gear, such as spacesuits and oxygen equipment, is ready.

VIPER:

- VIPER, which stands for Volatiles Investigating Polar Exploration Rover, is a robot the size of a golf cart that NASA will use to explore the moon's South Pole in late 2024.
- Originally scheduled for launch in 2023, NASA pushed the mission back to complete more tests on the lander system, which Astrobotic, a private company, developed as part of the Commercial Lunar Payload Services program.
- This robotic mission is designed to search for volatiles, which are molecules that easily vaporize, like water and carbon dioxide, at lunar temperatures. These materials could provide resources for future human exploration on the moon.
- The VIPER robot will rely on batteries, heat pipes and radiators throughout its 100-day mission, as it navigates everything from the extreme heat of lunar daylight when temperatures can reach 224 degrees Fahrenheit (107 degrees Celsius) to the moon's frigid shadowed regions that can reach a mind-boggling -240 C.
- VIPER's launch and delivery to the lunar surface is scheduled for November 2024.

Lunar Trailblazer:

- NASA has recently invested in a class of small, low-cost planetary missions called SIMPLEx, which stands for Small, Innovative Missions for PLANetary Exploration. These missions save costs by tagging along on other launches as what is called a rideshare, or secondary payload.
- One example is the Lunar Trailblazer. Like VIPER, Lunar Trailblazer will look for water on the moon.

- But while VIPER will land on the moon's surface, studying a specific area near the South Pole in detail, Lunar Trailblazer will orbit the moon, measuring the temperature of the surface and mapping out the locations of water molecules across the globe.
- Currently, Lunar Trailblazer is on track to be ready by early 2024.
- However, because it is a secondary payload, Lunar Trailblazer's launch timing depends on the primary payload's launch readiness.

PRIME-1 mission:

- The PRIME-1 mission, scheduled for a mid-2024 launch, is Lunar Trailblazer's ride.
- PRIME-1 will drill into the moon, it's a test run for the kind of drill that VIPER will use.
- An earlier Commercial Lunar Payload Services mission with the same landing partner was pushed back to February 2024 at the earliest, and further delays could push back PRIME-1 and Lunar Trailblazer.

JAXA's Martian Moon eXploration:

- The JAXA MMX mission concept to study Phobos and Deimos, Mars' moons.
- The Japanese Aerospace Exploration Agency, or JAXA, has a robotic mission in development called the Martian Moon eXploration, or MMX, planned for launch around September 2024.
- The mission's main science objective is to determine the origin of Mars' moons. Scientists aren't sure whether Phobos and Deimos are former asteroids that Mars captured into orbit with its gravity or if they formed out of debris that was already in orbit around Mars.
- The spacecraft will spend three years around Mars conducting science operations to observe Phobos and Deimos. MMX will also land on Phobos' surface and collect a sample before returning to Earth.

ESA's Hera mission

- It is a mission by the European Space Agency to return to the Didymos-Dimorphos asteroid system that NASA's DART mission visited in 2022.
- But DART didn't just visit these asteroids, it collided with one of them to test a planetary defence technique called "kinetic impact."
- DART hit Dimorphos with such force that it actually changed its orbit.
- The kinetic impact technique smashes something into an object in order to alter its path. This could prove useful if humanity ever finds a potentially hazardous object on a collision course with Earth and needs to redirect it.
- Hera will launch in October 2024, making its way in late 2026 to Didymos and Dimorphos, where it will study the physical properties of the asteroids.

STUDY REVEALS THE OLDEST EVIDENCE OF PHOTOSYNTHESIS



Why in news?

- The oldest evidence of photosynthetic structures reported to date has been identified inside a collection of 1.75-billion-year-old microfossils.
- The discovery helps to shed light on the evolution of oxygenic photosynthesis.

Oxygenic photosynthesis:

- Oxygenic photosynthesis, in which sunlight catalyses the conversion of water and carbon dioxide into glucose and oxygen, is unique to cyanobacteria and related organelles within eukaryotes.
- Cyanobacteria had an important role in the evolution of early life and were active during the Great Oxidation Event around 2.4 billion years ago, but the timings of the origins of oxygenic photosynthesis are debated owing to limited evidence.

Details:

- Researchers present direct evidence of fossilised photosynthetic structures from *Navifusa majensis*.
- The microstructures are thylakoids; membrane-bound structures found inside the chloroplasts of plants and some modern cyanobacteria.
- They identified them in fossils from two different locations, but the oldest, which come from the McDermott Formation in Australia, are 1.75 billion years old.
- *N. majensis* is presumed to be a cyanobacterium.
- The discovery of thylakoids in a specimen of this age suggests that photosynthesis may have evolved at some point before 1.75 billion years ago.

Thylakoids:

- Thylakoids represent direct ultrastructural evidence for oxygenic photosynthesis metabolism.
- Thylakoid membranes are dense, mostly galactolipid, protein-containing bilayers in which photosynthesis occurs in photosynthetic organisms.

Way Forward:

- It does not, however, solve the mystery of whether photosynthesis evolved before or after the Great Oxidation Event.

- Similar ultrastructural analyses of older microfossils could help to answer this question and help to determine whether the evolution of thylakoids contributed to the rise in oxygen levels at the time of the Great Oxidation Event.

SCIENTISTS DEVELOP ELECTRONIC SOIL THAT ZAP PLANT ROOTS WITH ELECTRICITY



Why in news?

- Recently, the researchers from Linköping University have unveiled an innovative electrically conductive cultivation soil, dubbed eSoil, which has demonstrated a remarkable ability to enhance the growth of barley seedlings by 50% within just 15 days.

Why it matters?

- This development in hydroponic technology could potentially revolutionise urban farming and contribute significantly to global food security.
- Hydroponics, the method of growing plants without soil, relies on water, nutrients, and a substrate for root attachment.
- The system is designed to be closed, allowing for efficient water recirculation and ensuring that each plant receives the precise nutrients it needs.
- This method conserves water and keeps nutrients within the system, a feat unachievable with traditional soil-based agriculture.

Key Highlights:

- Researchers emphasised the urgency of finding new agricultural methods due to the increasing world population and the challenges posed by climate change.
- The eSoil represents a significant advancement over commonly used mineral wool substrates in hydroponics, which are non-biodegradable and produced through energy-intensive processes.
- The new substrate is composed of cellulose, the most abundant biopolymer, combined with a conductive polymer known as PEDOT. While this mixture is not novel, its application in plant cultivation and as an interface for plants is unprecedented.

Potential:

- One of the key benefits of eSoil is its low energy consumption and the elimination of high voltage

risks associated with previous research that used high voltage to stimulate plant roots.

- The researchers have observed that barley seedlings grown in eSoil process nitrogen more effectively, although the exact biological mechanisms behind the enhanced growth and electrical stimulation's role remain to be fully understood.

Way Forward:

- While hydroponics alone may not solve the problem of food security, it can make a substantial difference, especially in regions with limited arable land and harsh environmental conditions.
- The study's findings pave the way for further research into hydroponic cultivation, potentially leading to more efficient food production methods.

SQUARE KILOMETER ARRAY PROJECT



Why in news?

- India had decided to formally join the Square Kilometer Array (SKA) project, an international scientific collaboration working to build the world's largest radio telescope.

Background:

- India had already been contributing to the project for the past several years, but the full member status, which offers greater scientific opportunities to use the upcoming facility, requires countries to sign and ratify an international treaty, and also make a financial commitment.
- India has approved Rs 1,250 crore for the project, which includes its funding contribution for the construction phase.

India's participation in other international mega science project:

- India has already decided to build a gravitational wave detector to join the international LIGO (Laser Interferometer Gravitational Wave Observatory) network, and is a full member of the ITER project, which is working to harness energy from nuclear fusion reactions.
- India also has a strong participation in the Large Hadron Collider (LHC), the world's largest and most

powerful particle accelerator that is running some of the most exciting experiments in particle physics.

Key Highlights of SKA:

- The Square Kilometer Array will not be a single large telescope, but a collection of thousands of dish antennas operating as a single unit.
- The name, Square Kilometer Array, comes from the original intention to create one square kilometre (one million square metre) of effective area for collecting radio waves.
- This was meant to be achieved by installing thousands of smaller antennas in a specific array design that would make them function like a single radio telescope. As of now, it appears that the USD 2.4-billion project (2021 prices) would eventually have a lesser collecting area than one square kilometre, but the original name has been retained.
- The antennas, about 200 of them in South Africa and more than 130,000 in Australia, are being installed in sparsely populated locations, chosen to ensure they are as far away from human activities as possible.
- This has been done in order to minimise signal interference from undesirable Earth-based sources. Construction at both the sites began in December 2022, and the first phase of the project is expected to be completed by next year.
- Once operational, SKA would be between 5 to 60 times more powerful than the most advanced existing radio telescopes functioning in comparable frequency ranges.

What it holds for India?

- Though none of the SKA facilities would be located in India, there are immense science and technology gains for the country by participating in the project as a full member.
- Radio astronomy is something in which India already has highly developed capabilities. The Giant Meterwave Radio Telescope (GMRT) near Pune is one of the most advanced facilities in the world, which has been producing remarkable scientific results. There are other similar facilities in Ooty, Nainital and Bengaluru.
- A full member status would provide India preferential access to the SKA facilities. Most existing telescopes operate under an open-use policy which allows research groups from any country to get time on the facility through competitive bidding by making a scientific case.
- Member countries will get preferential allocation of time on the radio telescope, roughly in proportion to their contribution to the project, and only limited time slots would be available through competitive bidding.
- The SKA would work on highest-end technologies, including electronics, software, materials science and computing.

- The intellectual properties generated by the project, though owned by the SKA Observatory, would be accessible to all the member countries. This can offer huge learning opportunities for scientists, academics and even private industry.
- Participating in the project is also expected to result in expanding the science and technology base in this area, along with capacity building and training opportunities.
- The Indian participation in the project is being led by Pune-based National Centre for Radio Astrophysics (NCRA), but 22 institutions are collaborating on SKA-related activities in the country. These include not just leading research institutions and some IITs and IISERs, but also a couple of universities and colleges. A few private companies are also involved.

India's involvement:

- India has been involved in the SKA project right from its inception in the 1990s, and contributed to the design and development of the telescope as well as in negotiating the SKA Observatory Convention, the international treaty that established the facility as an intergovernmental organisation.
- The main contribution has come in the development, and operation, of the Telescope Manager, the 'neural network' or the software that will run the entire facility.
- There are plans to set up an SKA regional centre in the country that will be part of the global network to process and store data and make it available for the scientific community.

Way Forward:

- Indian scientists have identified several areas of research for which they want to use the SKA telescopes. These include studies relating to the evolution of the early universe, the formation and evolution of galaxies, neutron star physics, and solar sciences.
- More than 150 scientists, researchers, and students from over 30 different Indian institutions, including a few private companies, have been participating in ongoing science activities related to the SKA.

WHAT IT WILL TAKE TO MAKE SCIENCE COMMUNICATION WORK FOR INDIA

Context:

- In 2023, the Indian Space Research Organisation (ISRO) launched Chandrayaan-3, the country's most recent lunar exploration mission.
- The lander's soft-landing was telecast on several channels, making it one of the largest demonstrations of a live scientific experiment in India.
- Overall, coverage of Chandrayaan-3 was an exemplar of the public communication of advanced science, and likely contributed to widespread understanding and discourse around the endeavour.



Science communication:

- Science communication involves all forms of communication around science, scientific work, its outcomes, discussions on its ethical, societal, or political impacts, and direct conversations with scientists as well as diverse audiences.
- Today, 'science communication' is an umbrella term that also includes the exchange of scientific knowledge, institutional outreach, and public engagement with science.

Gaps during COVID-19 pandemic:

- Even as governments implemented disaster management laws, the States' as well as experts' communication of scientific and healthcare-related information became significant.
- A good example is the manual on homemade masks issued by the Office of the Principal Scientific Advisor to the Government of India, which accelerated the use and adoption of reusable and affordable masks.
- Similarly, the 'Indian Scientists' Response to COVID-19' initiative shared evidence-based perspectives from experts on social media.
- But in spite of these initiatives, the pandemic exposed serious lacunae in the reliable communication of scientific information in India particularly vis-a-vis accurate data reporting, vaccine hesitancy, and prediction of the resurgence of infections.

Diverse nature:

- A space mission involves a well-defined and largely one-way relay of scientific information, and has the advantage of an inherent visual appeal, aspirational intent, and national sentiment.
- On the other hand, science communication in a pandemic is an interdisciplinary effort built around a grim, protracted, and evolving situation, and intended to promote public compliance with good 'pandemic habits' like physical distancing, masking, and vaccination.
- These contrasting communication endeavours underscore the diverse nature of contemporary science engagement.

Government's efforts:

- The history of state-backed science communication in post-independence India can be traced to a series of policy resolutions and government-led programmes.

- In 1951, the government established the Publications & Information Directorate (PID) under the Council of Scientific and Industrial Research (CSIR).
- The PID published the national science magazines Vigyan Pragati (Hindi), Science Reporter (English), and Science Ki Duniya (Urdu).
- The government followed up with an attempt to define India's scientific heritage and the cause of promoting science education through the Birla Industrial and Technological Museum in Calcutta in 1959.
- In 1976, Parliament passed the 42nd amendment to the Constitution. This included Article 51 A(h) and its statement: "It shall be the duty of every citizen of India to develop a scientific temper, humanism and the spirit of enquiry and reform."
- Soon after, the sixth Five Year Plan (1980-1985) promoted the need to popularise science and nurture scientific thinking in India, and established the National Council for Science and Technology Communication (NCSTC).
- In 1989, the Department of Science and Technology set up Vigyan Prasar, an autonomous organisation to popularise science at large.

Contemporary science communication landscape:

- In 2021, the government set up the CSIR-National Institute of Science Communication and Policy Research (CSIR-NIScPR) by merging two previous institutions. Nearly all national science funding agencies have science communication divisions, which issue press releases, conduct social media campaigns, and garner support for exhibitions, popular lectures, etc.
- Science communication activities from research organisations, universities, social enterprises, non-profit organisations, and professional collectives have also picked up. They include efforts to bridge science communication and journalism, science education and outreach, and even art and science.
- On the other hand, despite its remarkable achievements, the government closed Vigyan Prasar in early 2023.

Challenges:

Lack of science communication degree programme

- Science communication in India is currently not backed by formal education and training. A few institutes in India, including NIScPR, offer a PhD in science and technology communication while other organisations offer shorter training programmes. Also, while science communication research has grown significantly worldwide, it has yet to gain substantial focus in India.
- Expanding science communication degree programmes in India at the masters' and doctoral levels could support training and research in the field.
- This will also lead to a trained cadre of science communicators with an informed understanding of

the needs, perspectives and the consequences of their work in diverse educational, linguistic, and cultural contexts in the country.

Science communication a part of the scientific process:

- It's important to make the practice of science communication a part of the scientific process itself. This involves building student, scientist, and institutional-level approaches to effectively communicate science in constantly changing social, scientific, and political environments.
- Other possibilities include rewarding scientists for communicating science, nourishing public engagement, building institutional outreach programs, and translating research papers to regional languages, while building reflective and reflexive evaluation into these initiatives.

Cut across disciplines:

- Given the role of scientific solutions in national challenges, India needs a large-scale science communication strategy.
- This could start with a professional organisation with experts from many fields that works closely with government-level science departments and offices, and other partners and stakeholders, to build communication frameworks we can use to respond to challenges, as well as long-term plans to foster scientific rationale and public understanding of science.
- These frameworks will have to cut across disciplines – of science, medicine, disaster-management, national security, and diplomacy groups as well as media formats, communication networks, and demographic groups.

WHAT ARE LIGHT-EMITTING DIODES AND WHY ARE THEY PRIZED AS LIGHT SOURCES?



Context:

- The Nobel Prize in Physics 2014 was awarded jointly to Isamu Akasaki, Hiroshi Amano and Shuji Nakamura "for the invention of efficient blue light-emitting diodes which has enabled bright and energy-saving white light sources"

What are diodes?

- A diode is an electronic component about 5 mm wide. It has two points of contact, or terminals, called its anode and cathode. A diode's primary purpose is to allow current to flow in only one direction. It achieves this using a p-n junction.
- A p-n junction is made of two materials laid next to each other. One material is a p-type material: its primary charge-carriers are holes.
- The other is an n-type material: its primary charge-carriers are electrons. Electrons are 'places' inside atoms that carry negative charge. A hole denotes a 'place' in an atom or a group of atoms where there could be an electron but isn't. Thus, a hole is an electron placeholder but without the electron, so it has a positive charge.
- A p-n junction is an interface where the surface of a p-type material and the surface of an n-type material meet. At this interface, electrons can pass easily from the n-type material to the p-type material but can't go the other way. This asymmetry creates the diode's ability to allow current to pass in only one direction.
- A wire attached to the p-type material is called the diode's anode; that attached to the n-type material is the cathode. These are the diode's two terminals.
- When the two materials are first placed next to each other, some electrons move from the n-side to the p-side until there is a layer, between the two sides, where there are neither (free) electrons nor holes present.
- When a suitable voltage is applied across the diode, more electrons flow from the n-side to the p-side, implying an electric current flowing from the p-side to the n-side, that is from the anode terminal to the cathode terminal. But if the voltage is reversed, current won't flow in the opposite direction.

What is an LED?

- An LED is a diode that emits light. Inside the diode's p-n junction, the electrons have more energy than the holes. When an electron meets and occupies a hole, it releases energy into its surroundings.
- If the frequency of this energy is in the visible part of the electromagnetic spectrum, the diode will be seen to emit light. The overall phenomenon is called electroluminescence.
- The energy of a wave is proportional to its frequency. So making sure the light emitted by an LED is visible light is a matter of making sure the electron-hole recombination releases a certain amount of energy, not more and not less. This is possible to achieve thanks to the band gap.

What is the band gap?

- Particles like electrons can only have specific energy values. They can occupy only particular energy levels. When a group of electrons comes together in a

system, no two electrons can occupy the same energy level at the same time.

- These electrons generally prefer to have lower energy, and thus prefer to occupy the lowest available energy level. If that level is taken, they occupy the next available level. Sometimes they can acquire more energy, tear free from their atoms, and flow around the material.
- Electrons can acquire such extra energy when an electric field is applied to the material. The field will accelerate the electrons and energise them, and the electrons will be 'kicked' from lower to higher energy levels. In some materials, there is an energy gap between these lower and higher levels that is between when the electrons can't and can flow around the material.
- An electron can't have an amount of energy that would place it in one of these levels. It's the reason why electrons in these materials can't conduct an electric current unless they receive a minimum amount of energy, the energy required to jump across this gap. This gap is called the band gap.
- In LEDs, the energy emitted when an electron and a hole recombine is the energy of the band gap.
- Electron-hole recombination can be triggered by passing an electric current through the diode, which creates the electric field that 'kicks' the electrons.

What colours can an LED produce?

- Since LEDs can produce all three primary colours; red, green, and blue different LEDs can be combined on a display board to produce a large variety of colours.
- The scientists were able to create red and green LEDs more than 40 years before they created blue LEDs. The scientists had identified a compound, gallium nitride, that was electroluminescent and whose band gap could yield blue light, but they didn't know how to create crystals of this compound with the precise physical, electronic, and optical properties.
- Gallium nitride was also fragile, quickly becoming a powder in the process used to create crystals. Inventing the blue LED eventually required a series of breakthroughs in epitaxy, the process by which p-type and n-type materials are built layer by layer.
- In the late 1980s, three Japanese researchers, Isamu Akasaki, Hiroshi Amano, and Shuji Nakamura, led teams that produced a bright blue LED with gallium nitride.

What are the advantages of LEDs?

- According to Moore's law, specified by American engineer Gordon Moore in the 1970s, the number of transistors on a chip would double every two years.
- Similarly, improvements to LEDs since 1970 have followed Haitz's law. Named for scientist Roland Haitz, it states that for a given frequency of light, the cost per unit of light of an LED will drop 10x and the

amount of light it produces will increase 20x every decade.

- But even before Haitz's law, researchers prized LEDs because they were more efficient than incandescent bulbs and fluorescent lamps.
- Per watt of power consumed, LEDs can produce up to 300 lumen (amount of visible light emitted per second) versus incandescent bulbs' 16 lumen and fluorescent lamps' 70 lumen. Together with their greater durability and light contrast, LEDs' advantages translated to higher cost savings and less material waste.

Applications:

- LEDs have several applications in industry, consumer electronics, and household appliances: from smartphones to TV screens, signboards to 'feeding' plants light in greenhouses, barcode scanners to monitoring air quality.
- Today, LEDs can also produce a variety of colours or emit energy at higher and lower frequencies; LEDs can be 'embedded' in skin; and organic LEDs emit more light (albeit by a different mechanism). Researchers are also exploring more efficient LEDs made of materials called perovskites.

SEMICONDUCTORS ECOSYSTEMS UNDER EU INDIA TRADE AND TECHNOLOGY COUNCIL



Why in news?

- Recently, the Union Cabinet was apprised of a Memorandum of Understanding (MoU) between India and the European Commission on Working Arrangements on Semiconductors Ecosystems, its supply chain and innovation under the framework of EU-India Trade and Technology Council (TTC).

Details:

- The MoU intends to strengthen cooperation between India and EU towards enhancement of semiconductor for the advancement of Industries and digital technologies.

Implementation strategy and targets:

- The MoU shall come into effect from the date of signature and may continue until both sides confirm that the objectives of this instrument have

been achieved or until one side discontinues its participation in this instrument.

Impact:

- Both G2G and B2B bilateral Cooperation to boost the resilience of the semiconductor supply chains and leverage complementary strengths to promote collaboration in the field of semiconductors.

Background

- MeitY has been actively working to create a conducive environment for electronics manufacturing. Programme for Development of Semiconductor and Display Manufacturing Ecosystem in India was introduced with a view to ensure the development of a robust and sustainable semiconductor and display ecosystem in India.
- The said program aims to extend fiscal support for establishment of Semiconductor Fabs, Display Fabs, Fabs for Compound Semiconductors/Silicon Photonics/Sensors/Discrete Semiconductors and Semiconductor Assembly, Testing, Marking, and Packaging (ATMP)/Outsourced Semiconductor Assembly and Test (OSAT) facilities.
- Further, India Semiconductor Mission (ISM) has been established under Digital India Corporation (DIC) to drive India's strategies for development of semiconductor and display manufacturing ecosystem in the country.
- MeitY has also been mandated to promote international cooperation in the emerging and frontier areas of Electronics and Information Technology under bilateral and regional frameworks.
- With this objective, MeitY has entered into MoUs/MoCs/Agreements with counterpart organizations/agencies of various countries to promote bilateral cooperation and exchange of information and also to ensure supply chain resilience enabling India emerge as trusted partner.

Way Forward:

- This MoU is another step towards mutually beneficial semiconductor related business opportunities and partnerships between India & EU.

SOCIAL ISSUE

STRUCTURED NEGOTIATION AS A BOOST FOR DISABILITY RIGHTS

Context:

- Structured negotiation is a collaborative and solution-driven dispute resolution technique which is increasingly being used as an alternative to litigation.
- It typically involves inviting the defaulting service provider to the negotiation table and impressing upon them the benefits of complying with social welfare legislations.

- ⇒ While its utility pervades sectors, structured negotiation has been most effective in settling disability rights cases in the United States.



Applications:

- ⇒ So far, structured negotiation has been successful in addressing the issues relating to inaccessible automated teller machines, point of sale devices, pedestrian signals and Service provider websites.
- ⇒ It has convinced Walmart, CVS and Caremark to create accessible prescription bottles for blind or low vision customers.
- ⇒ It has also been able to drive institutional reform by facilitating strategies for creating more accessible voting machines and websites.

Methodology of structured negotiation:

- ⇒ Defaulting service providers want to avoid the high costs and negative publicity associated with litigation, while complainants want a barrier-free participation in the marketplace, both of which can be achieved through structured negotiation.
- ⇒ This is not to dilute the role of the law and legal advocacy in securing the protection of rights of marginalised populations.
- ⇒ Indeed, a key factor upon which the success of structured negotiation depends is the creation of a strong body of disabled-friendly legal precedents that create a robust foundation for structured negotiation to take place.
- ⇒ Once courts are able to create a blueprint for what accessibility and compliance with the law in a given sector looks like, structured negotiation emerges as a pathway for businesses to ensure that they are able to make their offerings accessible without having to go through the rigmarole of litigation and for users with disabilities to obtain a disabled-friendly offering without the cost and unpleasantness associated with litigation.

CCPD:

- ⇒ As it is, the increasing pendency, paperwork and red tape in Indian civil courts are already dissuading parties from using traditional dispute resolution methods.
- ⇒ India's flagship disability legislation, the Rights of Persons with Disabilities Act, 2016 provides that

any non-compliance with its provisions may be reported to the Chief Commissioner for Persons with Disabilities ('CCPD').

- ⇒ The CCPD then puts the defaulting service provider on notice, and may then either direct them to make their services accessible or impose penalties on them for non-compliance.
- ⇒ While the creation of a designated body for handling cases on disability rights has been a positive measure, its actual impact on repairing accessibility barriers in the marketplace remains to be seen.

Potential of Structured Negotiation technique:

- ⇒ The CCPD recently directed PayTM, a digital payments application to make its mobile applications accessible for Persons with Disabilities.
- ⇒ In complying with the order, the PayTM application ultimately became more inaccessible.
- ⇒ This incident demonstrates that any attempt to make digital services accessible for persons with disabilities in real time requires constant vigilance and user inputs which can validate the efficacy of solutions.
- ⇒ This is where the potential of a Structured Negotiation technique can be utilised. On one hand, it can allow service providers such as PayTM to avoid the embarrassment of being labelled as non-compliant.
- ⇒ It can also help them avoid hefty legal fees and prevent their officials from being tied up in paperwork before courts for days.
- ⇒ On the other hand, it can enable Persons with Disabilities to take their concerns directly to the service providers and monitor the fixes as they get implemented.

Way Forward:

- ⇒ However, the success of any alternative dispute resolution model is directly proportional to the level of priority that such service providers are willing to afford to the struggles of persons with disabilities.
- ⇒ Till the time such providers continue to feel that there are no real benefits of providing any services to persons with disabilities, any attempts to settle these claims amicably outside courts would be a tall order to achieve.
- ⇒ It is high time that businesses prioritised the needs of disabled users, and exhibiting openness to enter into a structured negotiation would be a powerful step in this direction.

ON DELISTING SOME KUKI-ZOMI TRIBES

Why in news?

- ⇒ The Manipur Government has been asked by the Centre to examine a representation seeking the delisting of certain Kuki and Zomi tribes from the Scheduled Tribes (ST) list of Manipur.



- ⇒ Following this, Chief Minister announced that a special committee might be formed to look into it.
- ⇒ The representation was sent by Maheshwar Thounaojam, National Secretary of the Republican Party of India (Athawale) in Manipur, who argued for the inclusion of Meiteis in the ST list by seeking the exclusion of certain Kuki and Zomi tribes.

What led to the representation?

- ⇒ This attempt to initiate a process for the possible de-scheduling of certain Kuki and Zomi tribes comes as the State runs into the eighth month of the ethnic conflict between the valley-based Meitei people and the hills-based Kuki-Zo (ST) people.
- ⇒ The conflict, that began on May 3, 2023, is said to have been triggered by an order of the Manipur High Court, which directed the State government to send a recommendation on the Meiteis' inclusion in the ST list to the Centre.
- ⇒ Now that a similar request has been forwarded by the Centre to the State government, this time over a representation to delist Kuki and Zomi tribes, there is potential for the widening of existing divides among the communities in the State.
- ⇒ Among the key reasons for which Meiteis have argued for ST status has been their inability to own land in the forested hill districts, where only STs can own land. This is the first time members of the Meitei community have tried to argue for their inclusion on the ST list by arguing that certain Kuki and Zomi tribes did not deserve to be on it.
- ⇒ This move could also have implications on the criteria used to define groups as STs; unchanged since the Lokur Commission introduced them in 1965.

What does the representation say?

- ⇒ The objections have been raised against the inclusion of three specific entries in the ST list of Manipur; "Any Mizo(Lushai) Tribes", "Zou", and "Any Kuki Tribes" over time. The principal argument being made for the exclusion of these three entries has been that they are not "indigenous" to the land of Manipur.
- ⇒ The representation claimed that there had been no mention of these particular tribes residing in the land of Manipur in pre-Independence Censuses.

- ⇒ It also said that the ambiguity of "Any Mizo (Lushai) Tribes" and "Any Kuki Tribes" in the ST list has allegedly aided illegal immigrants from Myanmar and Bangladesh in obtaining benefits meant for STs in India.

Historical aspect:

- ⇒ The argument that these communities were not residing in the land of Manipur at the time the first Constitution (Scheduled Tribes) list was published in 1950 does not hold ground.
- ⇒ To begin with, this order had listed three tribes for Manipur – "Any Kuki Tribe", "Any Lushai Tribe" and "Any Naga Tribe", under which respective sub-tribes were to be subsumed.
- ⇒ Secondly, there is no empirical evidence, as of yet, to show that these tribes names' presence in the ST list has aided any form of organised illegal immigration into Manipur, beyond individual instances and the rhetoric presented by the Meitei community.

First Backward Classes Commission:

- ⇒ However, the First Backward Classes Commission had noted in its 1955 report that these three broad tribe classifications originated under the British administration, adding that several communities such as Paite and Hmars refused to be identified under the umbrella of Kukis.
- ⇒ Accordingly, the Commission had recommended that for tribes of Assam and the hills of Manipur, individual tribe names be added to the ST list instead of umbrella tribes, for which these lists must be redrawn entirely given the dated nature of the information.
- ⇒ Subsequently, when the ST list for Manipur was revised in 1956, it included 29 entries with individual tribe names, save for one – "Any Mizo (Lushai) Tribe" – which was retained. This list also included the tribe "Zou". But Mr. Thounaojam's representation has claimed that neither of these entries were specifically recommended by the First Backward Classes Commission.

Lokur Commission:

- ⇒ Again in 1965, when the Lokur Commission prepared its report, it had also noted that there has been a "splintering tendency" among Kuki tribes. "Sub-groups and even clans wish to establish themselves as distinct entities in the political and social structure," the Commission had said of the Kuki tribes.
- ⇒ This "splintering tendency" among the Kuki tribes grew over the years, according to representatives of Kuki-Zo communities in Manipur, which eventually led several communities to adopt their unique community's identity.
- ⇒ By the end of the century, most people who would be considered under the umbrella of Kukis had already established their independent tribe names that had been added to the ST list over the years.

- Yet, there remained a need to address the need of a minority number of people who wanted to identify as Kukis, a Zomi representative explained. As a result, in 2002-2003, the entry "Any Kuki Tribes" was added to the ST list of Manipur.

Bhuria Commission Report:

- But the Bhuria Commission Report of 2002-2004 on Scheduled Tribes had observed that this particular addition had led to confusion about who would be classified under this entry.
- It had thus recommended mentioning tribe names in the ST list in order to nip "inter-tribe differences" in the bud.

WHAT IS THE LEGAL DISPUTE OVER AMU'S MINORITY STATUS?



Why in news?

- A seven-judge Bench of the Supreme Court (SC) led by the Chief Justice of India (CJI) D.Y. Chandrachud is currently hearing the 57-year-long dispute over the minority character of the Aligarh Muslim University (AMU).

What constitutes 'minority character'?

- Article 30(1) in Part III of the Constitution empowers all religious and linguistic minorities with a fundamental right to establish and administer educational institutions of their choice.
- Clause 2 ensures that the State maintains 'equality of treatment' in granting aid to all educational institutions, irrespective of their minority status. This includes educational institutions at all levels, from primary schools to professional education.
- These institutions enjoy exemptions from the implementation of SC, ST, and OBC reservations in both admissions and employment. Additionally, they can reserve up to 50% of seats for students from their community and exercise greater control over employees compared to other institutions.
- In the T.M.A Pai Foundation (2002) case, the SC clarified that a 'minority' is to be determined by the concerned State's demography, not the national population.

What is the background of the case?

- In 1877, Sir Syed Ahmed Khan, a Muslim reformer, founded the Muhammadan Anglo-Oriental College (MAO College) at Aligarh to address Muslim educational backwardness while protecting Islamic values. The Aligarh Muslim University Act, 1920 (AMU Act) was passed to incorporate the MAO college and the Muslim University Association into AMU.
- In 1951, the AMU Act was amended, removing compulsory religious education for Muslims and the exclusive Muslim representation mandate in the University Court.
- The Act was further amended in 1965, and the powers of the Court were redistributed among other bodies including the executive, with the President of India nominating members to the governing body.

Legal dispute:

- The legal dispute began in 1967 when the SC in S. Azeez Basha versus Union of India (UOI), reviewed the 1951 and 1965 amendments. The petitioners argued that since Muslims established AMU, they had the right to manage it.
- However, a five-judge SC bench upheld the amendments, reasoning that AMU was neither established nor administered by the Muslim minority, highlighting the Act's enactment through Central legislation. This ruling triggered nationwide protests, leading to the amendment of the AMU Act in 1981, affirming the university's minority status.
- In 2005, AMU reserved 50% of postgraduate medical seats for Muslim candidates. The Allahabad High Court struck down the reservation policy in Dr Naresh Agarwal vs UOI (2005) holding the 1981 amendment ultra vires. Consequently, in 2006, the UOI and the University appealed to the SC.
- However, in 2016, the UOI withdrew from the appeal, refusing to acknowledge the University's minority status. The University is now pursuing the case alone.

Issues before the SC:

- The apex court is addressing two issues; the criteria for determining the minority status of an educational institution and whether an institution established under a statute can enjoy such status. While the petitioners argue that AMU is entitled to the minority status, the UOI is now endorsing the S. Azeez Basha verdict.
- Sr. Adv. Rajeev Dhavan relied on the T.M.A Pai Foundation verdict to argue that statutory regulations or State aid, as given to AMU, do not deprive an educational institution of its minority character.
- It was argued that the Act of the legislature merely 'incorporated' the university as distinguished from its 'establishment' by the minority community under Article 30.
- Solicitor General Tushar Mehta contended that AMU was a 'loyalist' institution that had surrendered

its rights to the British government and assumed a secular character with the 1920 Act.

- The CJI interjected that AMU's political inclination does not affect its minority status. The judgment in this case will set a precedent impacting the rights and legal recognition of all minority institutions.

HEALTH

COULD SISAL LEAVES MAKE SANITARY NAPKINS MORE SUSTAINABLE IN INDIA?



Why in news?

- The ancient Aztec and Mayan civilisations were perhaps the first to begin making paper out of sisal leaves. Since then, they have been used to make twine, cloth, and carpets. The plant itself is also used to make mezcal, a distilled alcoholic beverage.
- Now, in a move to make menstrual hygiene products more environmentally sustainable, scientists at Stanford University have reported a method to produce from sisal leaves a "highly absorbent and retentive material".

Potential:

- The material can potentially replace cotton, wood pulp, and chemical absorbents in sanitary napkins.
- The absorption capacity of the material is higher than those found in commercial menstrual pads.
- The method uses no polluting or toxic chemicals, can be carried out locally at a small scale, and is environmentally sustainable.

Access to menstrual hygiene products:

- Access to menstrual hygiene products remains limited for around 500 million people worldwide. In rural India, for example, only 42% of adolescent women use exclusively hygienic methods to manage their periods.
- One key barrier in making menstrual hygiene products, like sanitary napkins, accessible is the rising cost of raw materials and distribution.
- The absorbent material in sanitary napkins is often a combination of wood pulp and synthetic superabsorbent polymers (SAPs). The latter are materials that can absorb a large amount of fluid relative to their own mass.

Non-biodegradable waste:

- Even as State and Central governments in India are working to make sanitary napkins available widely at lower prices, experts say that their widespread use is environmentally unsustainable.
- Menstrual sanitation waste is adding non-biodegradable waste in the environment and in turn, constituting an environmental hazard.
- The single-use sanitary napkins contain dioxin, which is a persistent environmental pollutant as well as a carcinogen that puts users of sanitary napkins at risk of cancer. The International Agency for Research on Cancer (IARC) classifies dioxin as a "known human carcinogen".

Why sisal?

- Like all succulents, which are plants with thickened parts to store more water, sisal has an uncanny ability to store water and thrive in drought-prone areas. Its leaves grow up to 2 m long.
- The lifespan of a sisal plant is about 7-10 years, during which it produces 200-250 usable leaves.
- Each leaf has about a thousand fibres that can be used to make ropes, paper, and cloth. Now, it could be used to make a highly absorbent material as well.
- Given the cultivation of sisal requires less water and is less environmentally damaging than cotton industries. There is a "25-fold difference" in water use "for cultivation and harvesting" "between cotton and sisal".

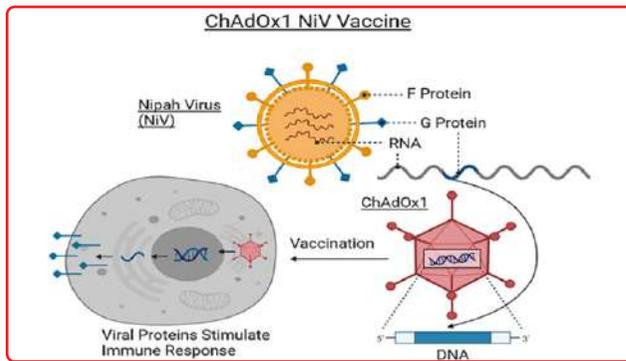
Mechanism:

- The recently developed process begins by feeding sisal leaves into a machine. This machine is a decorticator: it mechanically separates the fibres.
- In the next step, called delignification, a polymer called lignin, found in plant cell walls that repels water, is dissolved away. What remains is highly absorbent cellulose fibre.
- Traditionally, the delignification process for converting wood to absorbent wood pulp involves treating wood chips with a harsh chemical mixture containing water, sodium hydroxide (a strong alkali), and sodium sulphide. This process, called the Kraft process, is effective but also produces volatile and toxic by-products that can cause both air and water pollution.
- For a more environmentally sustainable way to delignify sisal leaves, they found two organisms particularly adept at converting wood to wood pulp: termites and wood-rot fungi.

Way Forward:

- A robust research is required to ensure plant fibre-based menstrual hygiene products live up to existing quality standards.
- The on-field performance of such plant based fibre products is [often] not at par with existing products.

HOW CHADOX1 NIPAHB VACCINE WORKS



Why in news?

- To combat the deadly Nipah virus (NiV), scientists have developed a vaccine candidate known as ChAdOx1 NiV, which has shown promising results in preclinical trials and has now entered human testing phases.

About Nipah virus:

- The Nipah virus, first identified during an outbreak in Malaysia and Singapore in 1998-1999, is a zoonotic virus.
- It is transmitted to humans from animals such as bats and pigs, and can also spread through contaminated food or directly between people.
- Nipah has epidemic potential, with its fruit bat hosts found in areas home to over two billion people.

What is ChAdOx1 NiV vaccine?

- The ChAdOx1 NiV vaccine uses a replication-deficient chimpanzee adenoviral vector, ChAdOx1, which has been engineered to express the NiV glycoprotein (G protein).
- This protein is crucial for the virus's ability to enter and infect cells, and by presenting it to the immune system without the presence of the actual virus, the vaccine primes the body to recognise and fight off the real pathogen upon exposure.

Efficacy:

- Preclinical studies have demonstrated the vaccine's efficacy. In one study, African green monkeys were vaccinated with ChAdOx1 NiV either once or with a prime-boost strategy, where a second dose is administered to bolster the immune response.
- Following vaccination, the animals exhibited robust humoral and cellular immune responses against the NiV G protein.
- When challenged with the lethal Nipah Bangladesh virus, the vaccinated monkeys showed no signs of disease, and researchers could not detect infectious virus in their tissues, indicating near-complete protection conferred by the vaccine.
- Furthermore, the vaccine is effective in Syrian hamsters, protecting them against bronchointerstitial pneumonia caused by the NiV Bangladesh strain.

These findings are particularly encouraging as they suggest that even a single dose of ChAdOx1 NiV may provide sufficient protection against the virus.

What's next?

- As the vaccine moves into human clinical trials, researchers remain cautiously optimistic. While there are currently no approved vaccines or treatments for Nipah virus infection in humans, the clinical trials of ChAdOx1 NiV represent a beacon of hope.
- If successful, this vaccine could not only save lives but also serve as a model for rapid vaccine development against emerging viral threats.

WHO CERTIFIES CABO VERDE MALARIA FREE, THIRD AFRICAN COUNTRY TO DO SO



Why in news?

- The World Health Organization (WHO) has certified Cabo Verde (also known as Cape Verde) as a malaria-free country, becoming the third country to acquire the status in the global health organisation's African region.

Details:

- Till now, WHO has awarded the 'malaria-free' certification to 43 countries and 1 territory.
- It has now joined Mauritius and Algeria, who were certified in 1973 and 2019, respectively.
- Africa has the highest malaria burden and accounted for roughly 95 per cent of global malaria cases and 96 per cent of related deaths in 2021.

Certification process:

- The certification is WHO's official recognition of a country's malaria-free status.
- It is granted after a country has demonstrated, using rigorous, credible evidence, that the chain of indigenous malaria transmission by Anopheles mosquitoes has been disrupted nationwide for at least three consecutive years.
- A country must also demonstrate the capacity to prevent the re-establishment of transmission.

Case of Cabo Verde:

- Cabo Verde, a group of 10 islands in the Central Atlantic Ocean, has faced significant malaria challenges. Prior to the 1950s, malaria was prevalent on all islands.

- Severe epidemics were common in the most densely populated areas before targeted interventions were implemented.
- Through the targeted use of insecticide spraying, the country eliminated malaria twice: In 1967 and 1983.
- However, subsequent failures in vector control resulted in the disease's reemergence. Since the late 1980s, malaria in Cabo Verde has been limited to two islands: Santiago and Boa Vista, which have been malaria-free since 2017.
- In 2017, the country transformed an outbreak into an opportunity. Cabo Verde identified issues and made improvements, resulting in zero indigenous cases for three years running.

About Malaria:

- Malaria is a life-threatening mosquito borne blood disease caused by plasmodium parasites.
- There are five Plasmodium parasite species that cause malaria in humans and two of these species, *P. falciparum* and *P. vivax*, pose the greatest threat.
- Malaria is predominantly found in the tropical and subtropical areas of Africa, South America as well as Asia.
- Malaria is spread by the bite of an infected female *Anopheles* mosquito.
- The mosquito becomes infected after biting an infected person. The malaria parasites then enter the bloodstream of the next person the mosquito bites. The parasites travel to the liver, mature, and then infect red blood cells.

KERALA COMES UP WITH OPERATION AMRITH TO TACKLE AMR



Why in news?

- The Kerala Drug Control Department launched tests in the first week of January 2024 called Operation Amrith (AMRITH - Antimicrobial Resistance Intervention For Total Health) to prevent the overuse of antibiotics in the state.

Key Highlights:

- Pharmacies must keep accurate records of antibiotic sales as per this initiative. Additionally, a poster mentioning 'antibiotics not sold without doctor's prescription' should be displayed in the establishment.

- If not complied, strict action would be taken against pharmacies and medical stores that supply antibiotics without doctor's prescription.
- The public can also participate in this initiative by reporting any pharmacies selling antibiotics without a prescription to the Drug Control Department.

Monitoring:

- Operation Amrith is aimed at conducting surprise raids in retail medical shops for detecting OTC sale of antibiotics and also a Toll Free Number is provided for lodging complaints against medical shops, according to the department.
- Once a complaint is received, it will be transferred to the corresponding zonal office for verification and immediate departmental actions will be taken, if violation is detected.

Multi-sectoral approach:

- The Kerala government was the first state in India that came up with the state action plan on AMR, KARSAP, in 2018.
- Aligned with India's National Action Plan on AMR, Kerala's plan reflected a multi-sectoral approach. Besides human health aspects, it aimed to address animal and environmental dimensions of the AMR problem, which is crucial for effective containment of AMR.
- Delhi-based think tank, Centre for Science and Environment, had actively contributed to the Kerala action plan and has been an implementation partner in the state's AMR containment efforts.

Initiatives:

- After the release of the state action plan on AMR, the Kerala government came up with many initiatives to deal with the issue of AMR in the state.
- This includes the Antibiotic Literate Kerala Campaign, under which the state is taking several initiatives to raise awareness about AMR. In August 2023, Kerala became the first state in India to establish block-level AMR Committees in all 191 blocks.
- With regard to surveillance, the government launched Kerala Antimicrobial Resistance Surveillance Network (KARS-NET) for human use surveillance and developed an integrated AMR surveillance plan in 2018-19 for non-human sector surveillance.
- The Kerala State Pollution Control Board (KSPCB) also inaugurated an AMR laboratory for environmental surveillance of AMR in August 2023.
- Additionally, for proper disposal of unused antibiotics, the Kerala government has come up with the Programme on Removal of Unused Drugs (PROUD), which is a drug take-back programme piloted in 2019 in the district of Thiruvananthapuram.

Why focus on AMR?

- The ability of bacteria and other microbes to resist the drugs used to inhibit or kill them is known as AMR.

Considered as a 'silent pandemic', this phenomenon was associated with being responsible for about five million deaths worldwide in 2019, with 1.3 million deaths being directly attributed to it.

- In 2017, the World Bank estimated that the global increase in healthcare costs are expected to reach up to \$1.2 trillion per year by 2050 in a high AMR impact scenario.
- In a similar situation, the world will lose 3.8 per cent of its annual gross domestic product by 2050 and there could be up to 10 million deaths annually, with the most deaths happening in Asia and Africa.

STATUS OF MEDICAL CARE ON INDIA'S TRAINS



Context:

- Medical care provisions in the Indian Railways need to address emergency medical conditions, and not accident-related emergencies alone. The Railways need to install a system to capture data on the healthcare needs of people travelling on trains and use that to inform policy

Voice for medical emergencies:

- The Balasore train accident in June 2023 raised important concerns about rail safety, but it was largely about accident-related safety. Due to its high passenger throughput, there is another kind of safety the Railways is responsible for but which is often overlooked, medical emergencies.
- In 2017, 1,076 medical emergencies were reported at the Katpadi Junction railway station in Vellore, Tamil Nadu. A quarter of these emergencies were trauma-related, and the remaining ranged from minor ailments like fever to life-threatening conditions like low blood sugar.
- Nearly one in every 10 emergencies reported at the station's emergency help desk, operated by the Christian Medical College (CMC) Vellore, required urgent, life-saving intervention.
- Non-communicable diseases like diabetes and hypertension are on the rise in India. In the last few years, the number of deaths due to heart attacks has also risen sharply. Is the Indian Railways prepared to handle medical emergencies that result?

Provision of emergency care:

- Medical care provisions in the Indian Railways has evolved to address emergency medical conditions, and not accident-related emergencies alone.
- In 1995, a 'special first aid box' was provided in long-distance superfast trains, Shatabdi and Rajdhani. This box consisted of 49 items and was to be used by a doctor travelling on the train.
- An improved version of this kit, called the 'augmented first aid box', containing 58 items was provided for specific long-distance trains.
- However, these medical provisions also were found to be inadequate, when they failed to save the life of Netrapal Singh, the Chief Legal Assistant of Railways, who succumbed to a heart attack while travelling from Jaipur to Kota in 2004.
- A petition filed in the Rajasthan High Court in 1996, to improve medical care provision in trains and railway stations, gained momentum after Mr. Singh's demise. In a 2005 judgment, the Court reported that the reason for underutilisation of the medical team in the pilot phase was a lack of awareness of the service.

Guidelines of Rajasthan High Court:

- The Court directed Railways authorities to reserve four berths in long-distance trains to provide medical care and to have a medical team in trains travelling more than 500 km.
- The Court also directed the authorities to adequately advertise the presence of this medical facility in all train compartments and on platforms. However, the Railways appealed this order in 2006 in the Supreme Court.
- It had reserved two berths for medical care, but since critically ill patients had to be deboarded for care and the project had a high cost, the Railways stopped doing this as well.

Supreme Court directives:

- Finally, in 2017, the Supreme Court directed the Railways to set up a committee consisting of experts from the All India Institute of Medical Sciences (AIIMS), New Delhi, to recommend further measures.
- Based on the Court's order and the committee's recommendations, the Railways determined to modify the contents of the first aid boxes and provide them at all railway stations and in all passenger-carrying trains.
- It also mandated first-aid training for railway staff at the time of joining and once every three years. The committee also recommended a review of service utilisation every three years.

The current status:

- In 2018, in response to a question in the Lok Sabha, the Minister of State in the Ministry of Railways replied that all recommendations of the AIIMS expert committee had been implemented.

- In 2021, the Railways also launched an integrated helpline number for all queries concerning the railways, including medical assistance.
- In February 2023, Ashwini Vaishnaw, the Union Minister of Railways, said in the Lok Sabha that deputing a doctor at every railway station had been deemed unnecessary. Yet in December, he said all recommendations of the committee had been implemented.
- Even now, a search on X (formerly Twitter) yields many posts of railway passengers complaining about poor medical services on trains.
- The trains are using the 1995 48-item list rather than the updated 88-item list from 2017.

The route ahead:

- Recent advancements in point-of-care diagnostics have revolutionised healthcare. The portable ECG devices and rapid diagnostic kits should be added to identify and treat heart attacks early.
- A more immediate step, however, is for the Railways to ensure the updated 88-item list is in place in all trains and that passengers are aware of these services.
- Periodic inspections are necessary to maintain the quality of care as well.
- Finally, the Railways needs to install a system to capture data on the healthcare needs of people travelling on trains and use that to inform policy.

GLOBAL SURGERY, WHY ACCESS TO ESSENTIAL SURGERY IS IMPORTANT



Why in news?

- Global surgery is the neglected stepchild in global health. The neglect is more shocking in South Asia which has the largest population globally lacking access to essential surgery.

What is global surgery?

- Global surgery focuses on equitable access to emergency and essential surgery. While it predominantly focuses on low- and middle-income countries (LMICs), it also prioritises access disparities and under-served populations in high-income countries (HICs).
- These “surgeries” include essential and emergency surgeries such as surgery, obstetrics, trauma, and anaesthesia (SOTA).

- Despite small differences, there is largely a consensus across multiple international groups on about thirty procedures that fall under the umbrella of emergency and essential surgery.

How far back does global surgery go?

- The year 2015, can be considered the “Annus Mirabilis” or the miracle year for global surgery. It proved to be an inflection point in recognising the importance of surgical care on a global scale.
- One key development that played a significant role in this transformation was the Disease Control Priorities Network (DCPN) report on essential surgery sponsored by the World Bank which highlighted that emergency and essential surgical care is cost-effective; scaling up surgical systems is cost-beneficial; and that there is a large disease burden that is surgically avertable.
- The second development was The Lancet Commission on Global Surgery (LCoGS) which brought together experts and stakeholders to examine the status of surgical care access around the world; ideate the indicators for monitoring surgical care preparedness; systemic capacity and impact; and to develop implementable strategies such as the national surgical, obstetrics, and anaesthesia plan (NSOAP).
- This paved the way for the passage of the World Health Organization Declaration on Safe Surgery (WHO Resolution 68.15) which recognised the impossibility of universal health coverage in the absence of required commitment to emergency and essential surgical systems.
- While 2015 set the stage for popular global surgery, it is critical to note that the history of the field as a whole goes back several decades. The exchange of knowledge and bilateral sharing of trainees under surgical missions in humanitarian settings across various parts of the world in the last century can be considered global.
- Given the focus on reducing disparities, people have also rightly argued that surgeons committed to delivering care in rural and remote parts of the world found global surgery several decades before 2015.

Lack of access:

- The magnitude of problems of global surgery is substantial, encompassing a range of challenges including inaccessibility, disease burden, and economic burden.
- The LCoGS noted that five billion people or over 70% of the global population lack timely access to safe and affordable surgical care when needed.
- Most severely, 99% and 96% of the people in low- and lower-middle-income countries (LLMICs) respectively, face access gaps compared to 24% in high-income countries (HICs), which points to a glaring global disparity.
- Of the five billion people, over 1.6 billion people lacking access live in South Asia. This translates to over 98%

of the South Asian population lacking access to safe and affordable SOTA care.

Impacts:

- In 2010, around 17 million deaths were attributed to surgically treatable conditions, surpassing the combined mortality burden of HIV/AIDS, tuberculosis, and malaria; emphasising the need for improved access.
- South Asia contributed to 50.46%, 32.49%, 26.67%, and 33.35% of the surgically avertable burden of neonatal and maternal diseases, congenital anomalies, digestive conditions, and injuries respectively.
- The disease burden also leads to an economic burden. The cumulative projected loss to GDP due to the absence of scale-up of surgical care are estimated to be \$20.7 trillion (in purchasing power parity terms) across 128 countries by 2030.
- The annual loss in societal welfare was about \$14.5 trillion for 175 countries. South Asia contributes to about 7% of the global lost welfare.

Neglect in national policymaking:

- Regardless of the disease and economic burden, surgery gets neglected in policies and health planning at the international level. The LCoGS noted that surgery contributed to <1% of all indicators mentioned in the World Bank, WHO, UNICEF, and other reports. Neglect is also present in national policymaking.
- An analysis of National Health Strategic Plans from 43 African countries noted that 19% did not mention surgery or surgical conditions at all while 63% mentioned surgery only five times or less. Similarly, an analysis of 70+ years of policymaking in India also noted limited and decreasing attention to surgery.
- The most recent National Health Policy (2017) had only two mentions of the partial phrase – “surg”.
- While The Lancet Commission on Global Cancer Surgery noted that surgery is central to national cancer control plans, India’s new guidelines on non-communicable diseases (2023) that focuses on cancer heavily has sparse mention of surgery.

Lack of research:

- A cursory bibliometric analysis reveals that in 2022, there were only 315 ‘global surgery’ titles (1.5%) in the Pubmed database compared to 21,453 ‘global health’ titles. Research is in turn tied to research funding. For instance, the biggest research funder for healthcare in the U.S. is the National Institutes of Health (NIH).
- In 2021, NIH funded 1,500 large research projects (R01 grants) worth \$750 million of which only 40 projects worth \$22 million were related to surgery and only one was about global surgery. Neglect in policy, financing, and research and all interrelated with one driving another.

What’s next?

- Work from LCoGS and DCPN depicted that emergency and essential surgical care is cost-effective and cost-beneficial.

- At least 30 LLMICs now have some subnational data on their surgical care indicators, the largest one being India. Several African countries have drafted and implemented NSOAPs showing strong political and policy commitment since 2015.
- In South Asia, Pakistan has formulated a National Surgical Care Vision, Nepal has initiated an NSOAP, and the Pradhan Mantri Jan Arogya Yojana has provided millions of surgeries at zero or negligible cost to the bottom 40% of Indians. Research and innovation, policy focus, and sustained financing are key to solving global surgery challenges.

THE IMPORTANCE OF PERIODIC TESTING FOR HUMAN PAPILOMAVIRUS



Context:

- January is Cervical Cancer Awareness Month.

What is Cervical cancer?

- Cervical cancer, which develops in a woman’s cervix (the entrance to the uterus from the vagina) is the second-most common cancer among women in India. It is caused by persistent infection by the human papillomavirus (HPV).
- Almost all sexually active people are infected by HPV at some point in their lives, but usually without symptoms, the World Health Organisation (WHO) states.
- In most people, the immune system clears up the virus. In some cases, certain high-risk strains of the virus persist in the body and could lead to cancer.
- India accounts for nearly a quarter of all cervical cancer deaths in the world. It is estimated that every year around 1.25 lakh women are diagnosed with cervical cancer, and nearly 75,000 of them die.

Eliminating cervical cancer:

- In 2022, the WHO adopted a strategy aimed at eliminating cervical cancer as a public health problem, worldwide.
- The strategy had three pillars; 90% of girls fully vaccinated by 2030 with the HPV vaccine, this to be done by age 15; 70% of women screened with a high-performance test between 35 and 45 for early treatment of pre-cancerous lesions, and 90% of

women identified with cervical disease, to receive treatment.

What needs to be done?

- Though India is unlikely to meet the 2030 goals, the silver lining, is a decline in incidence.
- Despite not having a robust national screening or vaccination programme as yet, the number of cases are decreasing. This could be attributable to a number of factors including sexual hygiene, age of pregnancy and number of children, use of contraception and the immune status of individuals.
- There is need for a combination of awareness programmes, a vaccination programme and regular screening to prevent new cases and deaths. The goal should be to detect at the precancerous stage so they do not progress to full-blown cancer. At that stage, it is 100% curable.

Cervical cancer screening:

- Up until some years ago, the gold standard, world over, to screen for cervical cancer, used to be the pap smear. The pap smear involves the scraping and brushing of cells from the cervix. These cells are then examined.
- The smear is recommended every three years, for women between the ages of 25 and 65, barring high-risk groups, for whom the recommendation is once a year.

Issues with pap smear:

- The problem with the pap smear however is that it requires a cytologist to study the smear, and many places, especially in rural India, may not have access to the test itself, or to cytologists to study the samples.
- The second issue is that awareness continues to remain low, and even in urban areas where women come forward to do the test, it is difficult to get them to come back for follow-up screenings.
- As of 2019, the WHO says, fewer than one in 10 women in India had been screened in the previous five years.

HPV DNA testing:

- HPV DNA testing is the recommended method for screening for cervical cancer: this involves testing cells from the cervix for infections with any of the HPV types that could cause cancer.
- The WHO, too, recommends that HPV DNA testing be the first-choice screening method for cervical cancer prevention, these tests are less prone to quality problems and human errors.

Vaccine:

- The WHO's Strategic Advisory Group of Experts on Immunization (SAGE) says that the HPV vaccine is highly effective for the prevention of HPV serotypes 16&18, which cause 70% of cervical cancers.
- In a recommendation in April 2022, SAGE stated that its review concluded that even a single-dose of HPV vaccine delivers solid protection against HPV that is comparable to two-dose schedules.

- The new SAGE recommendation is underpinned by concerns over the slow introduction of the HPV vaccine into immunisation programs and overall low population coverage, especially in poorer countries.

What are the government's plans?

- There are currently two vaccines available in India that protect against the disease: Merck's Gardasil and Serum Institute of India's Cervavac.
- In 2018 Sikkim became the first State in the country to introduce the vaccine. The vaccine (Gardasil) was provided free, under the State budget. All girls aged between 9 and 14 years were given two doses, separated by six months. Coverage of the first and second rounds was reported at over 95%.
- In 2022, India's National Technical Advisory Group on Immunisation (NTAGI) had recommended introducing the HPV vaccine in the country's Universal Immunisation Programme (UIP). A one-time catch-up vaccine was to be provided for 9 to 14-year-old adolescent girls, and subsequently, with a routine introduction at nine years.
- Initially, reports had indicated that the Central government would roll out a vaccination programme in six states in June 2023, targeting girls between the ages of nine and 14, covering 2.55 crore girls. However, this did not materialise.

IIL LAUNCHES FIRST INDIGENOUSLY DEVELOPED HEPATITIS A VACCINE, 'HAVISURE'



Why in news?

- Indian Immunologicals Ltd. (IIL), a wholly-owned subsidiary of the National Dairy Development Board (NDDB) and a biopharmaceutical company in India, launched India's first indigenously developed Hepatitis A vaccine, 'Havisure'.
- The vaccine represents a significant step forward in India's fight against Hepatitis A and is poised to make a substantial contribution to public health.

Details:

- The new vaccine, 'Havisure', is the result of extensive research and development efforts by IIL's dedicated team of scientists and researchers.
- This indigenously developed vaccine is poised to play a crucial role in preventing Hepatitis A, a highly

contagious liver infection that poses a significant public health challenge.

Havisure:

- The vaccine is effective in preventing the disease and is recommended for children with routine immunisations.
- It is a two-dose vaccine wherein the first dose is administered at 12 months of age and the second dose is given at least 6 months after the first dose.
- The vaccine is also recommended for individuals who are at risk of exposure or travel to regions with high Hepatitis A prevalence.
- In addition to this, people with an occupational risk of infection and suffering from chronic liver diseases also need the Hepatitis A vaccination.

About Hepatitis A:

- The word hepatitis refers to any inflammation of the liver, the irritation or swelling of the liver cells from any cause.
- Hepatitis A is a viral infection primarily spread through the fecal-oral route, meaning that it is transmitted through the ingestion of contaminated food or water.

JAMMU CSIR LAB FINDS CANNABIS COMPOUND THAT HAS ANTIBIOTIC EFFECTS



Why in news?

- Cannabis has the potential to make a dent in India's fight against the escalating threat of antibiotic resistance.
- Scientists at CSIR-Indian Institute of Integrative Medicine (IIIM), Jammu, have found that phytocannabinoids, a class of compounds found in the cannabis plant, possess some hitherto unexplored antibiotic properties.

Why AMR matters?

- Antimicrobial resistance (AMR) is a major health concern worldwide. It refers to when bacteria, viruses, fungi, and parasites no longer respond to medicines used to treat them.
- Bacteria have developed certain sophisticated 'shields' over many decades to resist the effects of antibiotic medications.

- These include the formation of biofilms, thin sheets of bacterial colonies that are more resistant to antibiotics than when separated and cellular mechanisms called efflux pumps that flush drugs out from cells.
- The resulting AMR increases the risk of disease spread, severe illness, and death.

What is India's AMR burden?

- According to one estimate, India reported 2.97 lakh deaths in 2019 that could be attributed to AMR and 10.42 lakh others that could be associated with AMR.
- Reports have also flagged the overuse of antibiotics in India, their misuse in animal husbandry, and poor waste disposal for engendering AMR and potentially rendering India the "AMR capital of the world".
- For these reasons, medical researchers are keen to tamp down AMR and find new drugs that fight AMR pathogens.

Alternative for MRSA:

- In the new study, IIIM researchers tested the antibacterial properties of tetrahydrocannabinol (THCBD), a semisynthetic phytocannabinoid, against *Staphylococcus aureus*, the bacteria responsible for the second most number of deaths due to AMR worldwide.
- Antibiotics are chemical compounds isolated from one microorganism and used to kill another. They have saved millions of lives since their discovery but are falling short against AMR bacteria.
- *S. aureus* includes a strain known as MRSA, for methicillin-resistant *S. aureus*, resistant to the last line of antibiotics called methicillin. The study revealed THCBD obtained from cannabis could fight MRSA.

How is THCBD made?

- Cannabinoids are a class of compounds found in the cannabis plant. The prefix 'phyto' in phytocannabinoid means it comes from a plant. Cannabinoids bind to receptors in the bodies of animals to produce a variety of neurological effects.
- The researchers extracted cannabidiol from a cannabis plant and made it react with hydrogen, using palladium as a catalyst.
- This process yielded a mixture of molecules with the same composition and order of atoms but different structures. One of them was THCBD.

What were THCBD's effects?

- The researchers tested THCBD against bacterial cultures in the lab. The minimum quantity found to be efficacious against a strain of Gram-positive *S. aureus* used commonly in AMR research was found to be 0.25 g/ml, which the researchers called "potent".
- They found THCBD "demonstrated strong effectiveness" against efflux pump overexpression and MRSA strains.
- They also wrote THCBD "significantly reduced" the number of viable microbial cells of *S. aureus* skin infections in mice.

➤ Finally, they found that the compound either complemented or was indifferent to the effects of other common antibiotics like mupirocin, penicillin G, and ciprofloxacin, meaning they could be used together.

What is the solubility challenge?

- Solubility is an important consideration for a drug. For example, many antibiotics are administered orally. Before their active ingredients can be absorbed at a specific site in the body, the drug will need to dissolve in an aqueous solution. If it doesn't dissolve properly, the body won't be able to absorb it as intended.
- Among other things, solubility is influenced by the properties of the solvent. For example, a molecule can be too hydrophilic (water-loving) or lipophilic (fat-loving).
- In a biological system, the cytoplasm – which fills the inside of a cell – is a gelatinous liquid and the cell's wall is primarily composed of lipids.
- A drug molecule in this milieu should be neither too hydrophilic nor too lipophilic but in between. THCBD "leans slightly towards lipophilicity", according to Dr Singh. Achieving this "drug-like" balance is crucial for it to be appropriately soluble.

Way Forward:

- The researchers' work on cannabis in future will "yield significant contributions to the healthcare system."

CENTRE RELEASES THREE DRUG REGIMEN FOR TREATING LEPROSY



Why in news?

- The Union government has approved a new treatment regimen for leprosy, aiming at stopping its transmission at the sub-national level by 2027.

Details:

- The Ministry of Health and Family Welfare has decided to introduce a three-drug regimen for Pauci-Bacillary (PB) cases in place of a two-drug regimen for six months.
- The move follows the "latest, globally accepted scientific research studies and evidence-based practices".

- The World Health Organization (WHO) had agreed to supply the revised drug regimen from April 1, 2025. Thus, all States and Union Territories have now been asked to send their requisitions for anti-leprosy drugs 12 months beforehand.
- The revised classification of leprosy and the treatment regimen for PB and multi-bacillary (MB) cases in India will be implemented from the same date.

About leprosy:

- The leprosy is a chronic infectious disease caused by Mycobacterium leprae.
- The bacteria are transmitted via droplets from the nose and mouth during close and frequent contact with untreated cases.
- Leprosy, reported from all the six WHO regions, is curable with multi-drug therapy (MDT). The majority of new cases detected are from Southeast Asia.

MDT:

- The WHO's recommended treatment regimen consists of three drugs – dapson, rifampicin and clofazimine. The combination is referred to as MDT.
- The duration of treatment is six months for PB and 12 months for MB cases. MDT kills the pathogen and cures the infection.
- The WHO has been providing MDT free of cost. Free MDT was initially funded by the Nippon Foundation and since 2000, it has been donated through an agreement with Novartis. This regimen is known as 'Uniform MDT', where a single three-pack kit can be given to all leprosy patients.

CULTURE

INDIA'S OLDEST LIVING CITY FOUND IN VADNAGAR



Why in news?

- A joint study by five prominent institutions has found evidence of a cultural continuity in Vadnagar in present-day Gujarat even after the collapse of the Harappan civilisation, thus making it likely that the "Dark Age" was a myth.
- The deep archaeological excavation at Vadnagar was conducted by a consortium of scientists from

the Indian Institute of Technology, Kharagpur, Archaeological Survey of India (ASI), Physical Research Laboratory, Jawaharlal Nehru University, and Deccan College.

Key Findings:

- It has now found evidence of a human settlement that is as old as 800 BCE contemporary to late-Vedic/pre-Buddhist Mahajanapadas or oligarchic republics.
- The study also indicates that the rise and fall of different kingdoms during the 3,000-year period and recurrent invasions of India by central Asian warriors were driven by severe changes in climate like rainfall or droughts.

Cultural stages in Vadnagar:

- Vadnagar was a multicultural and multireligious (Buddhist, Hindu, Jain and Islamic) settlement.
- Excavation in several deep trenches revealed the presence of seven cultural stages (periods) namely, Mauryan, Indo-Greek, Indo-Scythian or Shaka-Kshatrapas ('Satraps'), descendants of provincial governors of ancient Achaemenid Empires, Hindu-Solankis, Sultanate-Mughal (Islamic) and Gaekwad-British colonial rule and the city endures even today.
- One of the oldest Buddhist monasteries has been discovered during our excavation. They found characteristic archaeological artefacts, potteries, copper, gold, silver and iron objects and intricately designed bangles.
- They also found coin moulds of the Greek king Appollodatus during the Indo-Greek rule at Vadnagar.
- The period between the collapse of the Indus Valley Civilisation and the emergence of the Iron Age and cities such as Gandhar, Koshal, and Avanti is often depicted as a Dark Age by archaeologists.

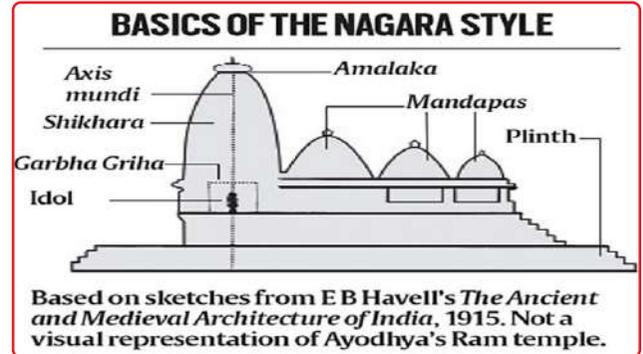
Oldest living city:

- Archaeological records are rare, the earliest one being the rock-inscription of Emperor Ashoka at Sudarsana Lake, Girnar hill, Gujarat.
- The evidence makes Vadnagar the oldest living city within a single fortification unearthed so far in India. Some of our recent unpublished radiocarbon dates suggest that the settlement could be as old as 1400 BCE contemporary to very late phase of post-urban Harappan period.
- If true, then it suggests a cultural continuity in India for the last 5500 years and the Dark Age may be a myth.

WHAT IS THE NAGARA STYLE, IN WHICH AYODHYA'S RAM TEMPLE IS BEING BUILT

Why in news?

- The Ram temple in Ayodhya was inaugurated on January 22. Chandrakant Sompura and his son Ashish, have designed the complex in the Nagara style of temple architecture.



Nagara style of temple:

- The Nagara style of temple architecture emerged some time in the fifth century CE, during the late Gupta period, in northern India.
- It is seen in juxtaposition with the Dravida style of southern India, which too emerged in the same period.

Distinguished by a towering shikhara

- Nagara temples are built on a raised plinth, with the garbha griha (sanctum sanctorum), where the idol of the deity rests, the most sacred part of the temple.
- Towering over the garbha griha is the shikhara (literally 'mountain peak'), the most distinguishable aspect of Nagara style temples.
- As the name suggests, shikharas are human-made representations of the natural and cosmological order, as imagined in Hindu tradition.
- Meru, Mandara and Kailasa are the first three names amongst the twenty types of temples described in the early texts, all three are the names of the Mountain, which is the axis of the world.
- A typical Nagara style temple also comprises a circumambulatory passage around the garbha griha, and one or more mandapas (halls) on the same axis as it. Elaborate murals and reliefs often adorn its walls.

Five modes of Nagara architecture:

- Depending on the period and geography, there is a large variation when it comes to what a shikhara looks like, or how it is used in a temple's design.
- On this basis, Adam Hardy in 'The Temple Architecture of India (2007)' identifies five modes of Nagara temple architecture; Valabhi, Phamsana, Latina, Shekhari, and Bhumija.

Evolution:

- The Valabhi and Phamsana are associated with what scholars have classified as Early Nagara Style.
- The Valabhi begins as a masonry rendering of the barrel-roofed (wooden) structure, simple or with aisles, familiar through chaitya halls (prayer halls, most associated with Buddhist shrines). A formalisation of multi-eave towers, wedged to a piling up of slabs, leads to the Phamsana.
- From these modes emerged the Latina, a shikhara which is a single, slightly curved tower with four sides of equal length.

- The mode emerged in the Gupta heartland, was complete with curvature by the early seventh century, and during that century spread across the entire breadth of northern India.
- The tenth century onwards, composite Latinas began to emerge, giving rise to Shekhari and Bhumija styles.
- The Shekhari shape has attached sub-spires or spirelets, echoing the main shape. These may run up most of the face of the shikhara, and be of more than one size.
- The Bhumija, on the other hand, has miniature spires, in horizontal and vertical rows, all the way to the top, creating a grid-like effect on each face. The actual shikhara often approaches a pyramidal shape, with the curve of the Latina less visible.
- Consequently, there is also immense variation within these modes. Temples can even contain multiple kinds of shikharas on top of a simple structure, with the tallest always being on top of the garbha griha.

Comparison to Dravida style:

- The Dravida counterpart to the shikhara is the vimana. There exists, however, a fundamental difference.
- In the Dravida style temples, vimanas are typically smaller than the great gatehouses or gopurams, which are the most immediately striking architectural elements in a temple complex. Moreover, while shikharas are mentioned in southern Indian architectural sources, they refer to only the dome-shaped crowning cap atop the vimana.
- The existence of gopurams also points to another unique feature of the Dravida style – the presence of a boundary wall. Few Nagara style temple complexes are lined with distinctive boundary walls that are a part of the temple's design.
- This is one of Ayodhya's Ram temple's 'hybrid' features, although no elaborate gopuram has been built (citing paucity of space), a 732m long wall runs around the temple compound.

MISCELLANEOUS

THE KHARSAWAN MASSACRE OF 1948



Why in news?

- On January 1, 1948, the town of Kharsawan in present-day Jharkhand witnessed a massacre reminiscent of what happened in Jallianwala Bagh in 1919.
- Police opened fire at a crowd gathered for a protest and the weekly haat (market), killing hundreds, or by some accounts, thousands of Adivasis.

Demand for a separate tribal state:

- In 1912, the Bengal Presidency was partitioned to create the Bihar and Orissa Province. However, within this new province, there existed a large Adivasi population with its distinct culture, and many grievances with both the British and non-tribal populations.
- Thus, in 1912 itself, the demand for a separate tribal state was articulated for the first time at St Columba's College, Hazaribagh.
- Over the next few years, this demand would gain momentum. The Simon Commission, mandated to report on constitutional reforms in India, gave it official credence in 1930.
- While Orissa was carved out in 1936, Adivasis' demands remained unheard. In 1938 the Adivasi Mahasabha was formed to continue the struggle, with Jaipal Singh Munda (1903-70), former captain of the Indian hockey team, emerging as its tallest leader.

The problem of Kharsawan's merger with Orissa:

- Kharsawan was a small princely state, less than 400 sq km in area, lying to the west of Jamshedpur.
- At the time of Independence, Kharsawan, alongside 24 other princely states in eastern India, decided to accede to the Union of India and join the state of Orissa.
- After all, Kharsawan and neighbouring Saraikela (which today form the Saraikela Kharsawan district in Jharkhand), had more Odia speakers than Hindi speakers.
- But most Adivasis did not support this merger. They also did not want to join Bihar, the alternative option. What they wanted was a separate Adivasi state. In protest, a huge meeting was called at Kharsawan on January 1, 1948, the day when the merger was to take place.
- This was also the day of the weekly haat in the town. Jaipal Munda himself was supposed to be present and address the crowd.
- The crowd comprised young and old, men and women, those from nearby villages and those living hundreds of kilometres away. While the merger of Kharsawan was a major issue, many had come to simply catch a glimpse of Jaipal Munda.

What happened on January 1, 1948?

- The sheer size and enthusiasm of the crowd spooked the Orissa military police, which had taken charge of law and order in the town.

- Keep in mind, this was the time when princely states from across the country were being integrated with the Union of India. This created a situation where the smallest spark could trigger something horrendous. That is exactly what happened on January 1, 1948.
- On the day of the massacre, Kharsawan resembled a "police camp". Amidst this, the 50,000-strong crowd gathered, raised their demands, and waited eagerly for Jaipal Munda to show up. Moreover, many more were shopping at the nearby haat. Kharsawan, which had a population of less than 7,000 in 2001, was full to the brim.
- However, due to some reason, Munda could not show up. Many believe that his mere presence could have averted the tragedy that followed. The crowd was restive and pretty much surrounded by the police. Suddenly, the cops opened fire with their Sten guns.
- There was a well near the spot where the massacre took place and the police started disposing of dead bodies in it. After the well was filled with bodies, the rest were taken to the jungle and dumped there. Yet, those injured probably had it even worse.

Aftermath:

- To date, there is no consensus regarding just how many lives were lost in the massacre.
- The then Orissa government confirmed only 35 dead, a number which was published in *The Statesman* two days later, the headline read '35 Adivasis Killed in Kharsavan'.
- However, actual numbers are likely to have been far higher. In *Memoir of a Bygone Era* (2000), PK Deo, a former Lok Sabha MP and the last ruler of Kalahandi, stated that at least 2,000 Adivasis were killed, and many more were likely injured.
- The world knows about the villain of the Jallianwala Bagh Massacre, but the Reginald Dyer behind the Kharsawan massacre hasn't been unmasked, even today.
- Today, a memorial stands at the marketplace in Kharsawan, which some have described as a "political pilgrimage" site in the state.



Indore, who had conquered the top spot alone for 6 consecutive years. The next best is Navi Mumbai.

- The list of top 10 cleanest cities with a population of more than one lakh includes Greater Visakhapatnam, Bhopal, Vijayawada, New Delhi, Tirupati, Greater Hyderabad and Pune.
- In the category of cities with a population of less than one lakh, Sasvad and Lonavala in Maharashtra and Patan in Chhattisgarh secured the top three spots.

State rankings:

- In the State rankings, Maharashtra came first, followed by Madhya Pradesh and Chhattisgarh. Odisha is ranked fourth, followed by Telangana, Andhra Pradesh, Punjab, Gujarat, Uttar Pradesh, Tamil Nadu, Sikkim, Karnataka, Goa, Haryana and Bihar.
- In the category of cities with a population of less than 1 lakh, Sasvad, Patan and Lonavala secured the top three spots.
- Mhow Cantonment Board in Madhya Pradesh was adjudged the Cleanest Cantonment Board.
- Varanasi and Prayagraj won the top two awards amongst the Cleanest Ganga Towns.
- Maharashtra, Madhya Pradesh and Chhattisgarh won the top three awards for Best Performing State.
- Chandigarh walked away with the award for the Best Safaimitra Surakshit Sheher.

Zonal awards:

- Twenty zonal awards were given to medium and small cities.
- Madhyamgram, Kalyani and Haora, all cities in West Bengal, have the dubious distinction of being placed at the bottom of the list, while the States at the end of the list were Rajasthan, Mizoram and Arunachal Pradesh.

About Swachh Survekshan:

- The Swachh Survekshan, which began with a modest evaluation of 73 major cities in 2016, now covers 4,477 cities.
- The theme of the cleanliness survey 2023 was "Waste to wealth", while for 2024, it is "Reduce, reuse and recycle".

WHAT IS 'PRIOR APPROVAL' NEEDED BEFORE INVESTIGATING PUBLIC OFFICIALS ACCUSED OF CORRUPTION?

Why in news?

- The Supreme Court recently delivered a split verdict in former Andhra Pradesh Chief Minister Chandrababu Naidu's plea to quash an FIR in the alleged skill development scam case.

Details:

- Justices Aniruddha Bose and Bela M Trivedi disagreed on whether the AP CID was required to seek 'previous approval' from the state government before

conducting an inquiry into the allegations against Naidu.

- Justice Bose held that prior approval was necessary, which the CID did not have when it opened the inquiry. Justice Trivedi held it was necessary to seek approval only to investigate offences committed after 2018, the year this requirement was introduced.



Prior approval requirement:

- In 2003, the Delhi Special Police Establishment Act, 1946, which governs agencies like the CBI, was amended. Under Section 6A, it was required to seek approval from the central government before investigating alleged offences under the Prevention of Corruption Act (PCA), 1988, if the employee in question held a rank higher than joint secretary.
- The Supreme Court struck down this requirement in 2014. Four years later, the PCA was amended and a similar provision was introduced as Section 17A.
- Under this section, if a public servant commits an offence under the Act while discharging their official duties, investigators must receive approval from the central/ state government, or a competent authority to open an inquiry or investigation.

Challenge to provision:

- In 2018, the NGO Centre for Public Interest Litigation (CPIL) challenged the constitutionality of the previous approval requirement.
- It argued that it would be "extremely difficult" to determine if an offence was committed by a public official while they were discharging their duties if no investigation could be conducted in the first place.
- Placing this burden on police officers and investigating agencies would in effect protect corrupt officials, and the levels of corruption would rise.
- The CPIL also pointed to the 2014 case in which the Supreme Court had struck down a similar requirement.
- In July 2023, the case was listed before a Bench of Justices B V Nagarathna and Sanjay Karol.

Similar instances:

- The case involving Chandrababu Naidu is not the first time that the SC has decided whether the 'previous approval' requirement should apply retrospectively. In September 2023, a Constitution Bench held that

- officials cannot claim immunity under Section 6A, even if the offence was committed before this provision was struck down. (CBI v R R Kishore)
- ⇒ In 2018, when former Delhi Police Commissioner Rakesh Asthana was being investigated for allegedly accepting bribes, then Additional Solicitor General P S Narasimha had opined that there was no need for prior approval to lodge an FIR.
 - ⇒ The case against Asthana reached the Supreme Court in 2021 but was adjourned repeatedly without being heard, and was declared infructuous after Asthana retired in 2022.

CABINET APPROVES CREATION OF 3 OFFICER-LEVEL POSTS FOR 16TH FIN COMM



Why in news?

- ⇒ The Cabinet recently approved the creation of three officer-level posts for assisting the 16th Finance Commission, chaired by Arvind Panagariya.
- ⇒ The Union Cabinet has approved the creation of three posts at the level of Joint Secretary i.e. two posts of Joint Secretary and one post of Economic Adviser, for the 16th Finance Commission.

Key Highlights:

- ⇒ The government appointed former vice chairman of Niti Aayog Panagariya as the chairman of the 16th Finance Commission.
- ⇒ Ritvik Ranjanam Pandey was named as the Secretary to the Commission.
- ⇒ The Commission would submit its report to the President by October 31, 2025. The report would be for five years commencing April 1, 2026.

Terms of reference:

- ⇒ Besides suggesting tax devolution between the Centre and states and revenue augmentation measures, the Commission would review the present arrangements for financing disaster management initiatives with reference to the funds constituted under the Disaster Management Act, 2005.

About Finance Commission:

- ⇒ The Finance Commission is a constitutional body that gives suggestions on centre-state financial relations.

- ⇒ The erstwhile 15th Finance Commission under NK Singh had recommended that states be given 41 per cent of the divisible tax pool of the Centre during five-year period 2021-22 to 2025-26, which is at the same level as was recommended by the 14th Finance Commission.

INDIGENOUS MOBILE HOSPITAL (BHISHM) DEPLOYED IN AYODHYA



Why in news?

- ⇒ Two Arogya Maitri Disaster Management Cube-BHISHM, revolutionary mobile hospitals equipped with cutting-edge technology, have been deployed in Ayodhya to bolster medical readiness and response capabilities during the upcoming 'Pran Pratishtha' ceremony.
- ⇒ This cube is a part of the broader initiative named "Project BHISHM" — Bharat Health Initiative for Sahyog, Hita and Maitri, is tailored to treat up to 200 casualties, emphasizing rapid response and comprehensive care.

Salient features:

- ⇒ The Aid Cube is equipped with several innovative tools designed to enhance disaster response and medical support during emergencies.
- ⇒ It integrates Artificial Intelligence (AI) and data analytics to facilitate effective coordination, real-time monitoring, and efficient management of medical services in the field.
- ⇒ The whole unit contains 72 easily transportable components that can be conveniently carried by hand, cycle, or even drone, providing unmatched flexibility.
- ⇒ In the face of mass casualty incidents (MCIs), where requirements range from basic aid to advanced medical and surgical care, the Aid Cube stands out with its ability to be deployed within an astonishing 12 minutes.
- ⇒ This swift deployment capability is crucial, as it effectively bridges the crucial time gap from primary care to definitive care, potentially saving numerous lives in the golden hour of emergencies.

Potential:

- These cubes are robust, waterproof, and light, designed for various configurations, making them ideal for diverse emergency scenarios. From airdrops to ground transportation, the cube can be rapidly deployed anywhere, ensuring immediate response capability.
- Advanced medical equipment, RFID-tagged for efficient repacking and redeployment, is a key feature of the Cube.
- The state-of-the-art BHISHM software system integrated into a provided tablet allows operators to locate items quickly, monitor their usage and expiry, and ensure readiness for subsequent deployments.

INTERNATIONAL RELATION**STRAINED TIES IN INDIA MALDIVES RELATIONS****Why in news?**

- Prime Minister Narendra Modi's tourism push for Lakshadweep triggered a social media spat, escalating into a diplomatic clash between India and the Maldives, worsening the already strained relationship between the Indian Ocean neighbours.
- Disparaging remarks led to the suspension of three Maldivian Ministers.
- India-Maldives relations have hit a rough patch since Mohamed Muizzu was elected President in 2023 on the back of an 'India Out' campaign.

What led to the 'India out' campaign during Solih's administration?

- The Maldives is a key maritime neighbour of India in the Indian Ocean Region (IOR). The country's location holds significant strategic importance to India, especially amid China's growing engagements in the region.
- Although Maldives-India ties have been mostly cordial over the years, there was a noticeable tilt towards China during the presidency of Progressive Party of Maldives (PPM) leader Abdulla Yameen from 2013 to 2018. It was under Mr. Yameen that China included the Maldives as a part of its Belt and Road Initiative (BRI).

Relations under Solih administration:

- Bilateral ties improved when Ibrahim Mohamed Solih of the Maldivian Democratic Party (MDP) took over the reins from Mr. Yameen in 2018.
- He adopted an 'India first' foreign policy to establish a closer relationship with India in the areas of defence, security and economics.
- However, the growing proximity between both countries and high-level military exchanges sparked concern in certain quarters, leading to an 'India out' campaign spearheaded by the Opposition.
- The critics of the Solih administration alleged that the government was compromising the sovereignty of the island nation and "allowing Indian boots on the ground."
- The Opposition sharpened its attack after the government signed the Uthuru Thila Falhu (UTF) deal with India in 2021 to jointly develop the National Defence Force Coast Guard Harbour.

Muizzu's government:

- In September 2023, Mr. Muizzu won the contest with 54% of the votes, and in November, took oath as the eighth President of the island nation.
- The first signs of a shift in foreign policy emerged when the new Maldivian President skipped India and instead travelled to Turkiye in November on his first official visit. It marked a departure from a long tradition of Maldivian heads visiting India first.
- He has since travelled to the UAE and is currently on a five-day visit to China at the invitation of Chinese President Xi Jinping.

Why did President Muizzu insist on the withdrawal of Indian soldiers?

- In his first address to the nation after taking the oath, he insisted on the withdrawal of Indian soldiers from the Maldives as he pledged to safeguard the sovereignty and independence of the Maldives.
- Maldives hesitance to maintain defence ties with India was again evident from the absence of a Maldivian government representative in the latest round of the Colombo Security Conclave held in Mauritius in December 2023.

Why did the decision to revoke the survey pact with India cause a stir in political circles?

- The Muizzu government caused a stir in political and strategic circles with its decision to revoke a key 2019 agreement with India for conducting surveys in Maldivian waters.
- The MoU for hydrographic surveying, signed during PM Modi's state visit to the islands when President Ibrahim Solih was in power, backed the commitment of the two countries to maintain close cooperation in defence and maritime security.
- Critics of the Solih government, however, had claimed that it harmed national security.

HENLEY PASSPORT INDEX 2024



Why in news?

- The Henley Passport Index 2024 was released recently, highlighting the "power" of passports of 199 countries.

Top scorers:

- The index, which ranks countries based on the number of destinations that allow visa-free entry to their passport, was topped by France, Germany, Italy, Japan, Singapore and Spain.
- Passports of all these countries have visa-free access to 194 destinations, three more than last year.
- Japan and Singapore have continued to top the list for five years now.
- South Korea, Sweden and Finland rose one spot to take joint second place, with access to 193 countries.
- Austria, Denmark, Ireland and the Netherlands shared third place, allowing travel to 192 places.
- The UK and US passports ranked fourth and seventh, respectively, with access to 191 and 188 destinations.

Where does India stand?

- According to the latest ranking, India stands at the 80th rank in the list of most powerful passports.
- Its passport has visa-free access to 62 nations, including Angola, Barbados, Bhutan, Bolivia, Djibouti, El Salvador, Jamaica, Jordan, Kenya, Malaysia, Mauritius, Nepal, Qatar and Zimbabwe.
- India shares the rank with Uzbekistan.
- In 2023, too, India's passport was ranked at the 80th spot, up five places from 2022. However, the number of visa-free destinations has jumped from 57 to 62 in 2023.

Which are the least powerful passports in the world?

- The least powerful passport in the world is Afghanistan.
- It ranked at 104th spot with access to 28 countries.
- It is followed by Syria (103), Iraq (102), Pakistan (101) and Yemen (100).

Which passports have shown the most improvement in ranking?

- The United Arab Emirates was the fastest climber over the past decade, jumping to 11th place and offering access to 183 destinations without a visa.

- China, up two spots to 62nd place, has visa-free access to 85 destinations, almost twice as many as ten years ago.

About Henley Passport Index:

- The Henley Passport Index is an annual list put together by Henley & Partners, a London-based global citizenship and residence advisory firm.
- It ranks different passports according to the number of destinations their holders can visit without a prior visa or can avail of a visa on arrival, a visitor's permit, or an electronic travel authority (ETA) on entering the destination.
- The rankings are based on the analysis of data provided by the International Air Transport Association (IATA).
- It then provides a 'Visa-free score' which, essentially, is the number of destinations that the holders of that particular passport can travel to without a prior visa or can avail of a visa on arrival or other similar permits.

MALDIVES MOVES TO REPLACE INDIA, INKS DEAL WITH TURKEY FOR DRONES TO PATROL HIGH SEAS



Why in news?

- The new government in Maldives has signed a USD 37-million deal with Turkey to buy military drones that will patrol its high seas, a task so far done by India in partnership with the Maldivian defence forces.

Background:

- The decision comes in the backdrop of President Mohamed Muizzu's 15 March deadline for 77 Indian military personnel to leave the island nation.
- He came to power in September 2023, riding on an anti-India rhetoric and 'India out' campaign.

Helicopters gifted by India:

- The Indian officers stationed in Maldives were those who operated and maintained two Dhruv Advanced Light Helicopters and a Dornier aircraft gifted to the Maldives National Defence Force (MNDFF) by India, besides training the Maldivian military.
- The helicopters were used for transport of patients from various islands of the archipelago nation to

hospitals in Malé, which has saved over 500 lives till now.

- The Dornier carried out reconnaissance flights by the Maldivian military against suspicious ships, gun and narcotics trafficking.

Turkish drones:

- These will now be replaced by Turkish drones, the likely candidate being the Aksungur drones which are used for maritime operations and surveillance.
- The money for the Turkish drones has been allocated from the state's contingency budget. Quoting government sources.
- Under the agreement signed by the Maldives government with a company which supplies drones to the Turkish military, the money will be paid in instalments. According to the agreement, the payment for the transaction must be done within this year.
- Turkey has been at the forefront of drone warfare and has emerged as one of the biggest exporters of drones, both armed and unarmed.
- The two leading Turkish companies in drone manufacturing are Baykar Defense, owned by the son-in-law of Turkish President Recep Tayyip Erdogan and Turkish Aerospace Industries (TAI), owned by a Turkish military foundation.

India-Maldives:

- Maldives is one of India's key maritime neighbours in the Indian Ocean Region (IOR) and part of its 'Neighbourhood First Policy'. But ties between both have been strained ever since President Muizzu came to power.
- The President, perceived to be "pro-China" broke precedent and went to Turkey as part of his first foreign visit instead of India. He has also made a state visit to China.
- Under then-President Abdulla Yameen of the Progressive Party of Maldives (PPM), Male had signed a Comprehensive Action Plan for Defence in 2016 with India. When the lease for these helicopters expired in 2018, the Yameen government asked New Delhi to take them back.
- However, after pro-India Ibrahim Mohamed Solih of the Maldivian Democratic Party came to power in September that year, these demands were revoked.

THE GROWTH OF INDIA BANGLADESH TIES

Why in news?

- Recently, the Prime Minister Sheikh Hasina returned to power in Bangladesh for a historic fourth straight term after her party, the Awami League, secured two-thirds of the seats in national elections.
- Prime Minister of India was among the first world leaders to congratulate her, illustrating the close bilateral relationship between the two countries.



Historical aspect:

- The foundation of India's relationship with Bangladesh was laid in the 1971 Bangladesh Liberation War. India provided critical military and material support to assist Bangladesh in its fight for independence from Pakistan.
- Despite this, relations soured within a few years as military regimes took control. There was a rise in anti-India sentiment in the mid-1970s over issues ranging from boundary disputes and insurgency to the sharing of water.
- The instability continued for a few decades until Sheikh Hasina came to power in 1996 and scripted a new chapter in bilateral ties with a treaty on the sharing of Ganga waters.
- Since then, India and Bangladesh have built cooperation in trade, energy, infrastructure, connectivity and defence.

What about economic cooperation?

- Bilateral trade between India and Bangladesh has grown steadily over the last decade. Bangladesh has emerged as India's largest trade partner in South Asia, with bilateral trade reaching \$18 billion in 2021-2022 from \$10.8 billion in 2020-21, though there was a dip in 2022-23 due to the pandemic and the Russia-Ukraine war.
- India is also the second biggest trade partner of Bangladesh, with exports amounting to \$2 billion in Indian markets.
- In 2022, both nations concluded a joint feasibility study on a Comprehensive Economic Partnership Agreement (CEPA). The agreement, typically designed to reduce or eliminate customs duties on traded goods and simplify trade norms, is anticipated to open up broader social and economic opportunities.
- The CEPA gains additional significance as Bangladesh is set to lose its Least Developed Country (LDC) status after 2026, thereby losing its duty-free and quota-free market access in India.
- Bangladesh will be eager to finalise a Free Trade Agreement (FTA) with India, and also pursue the China-backed Regional Comprehensive Economic Partnership (RCEP). This dual approach raises concerns for India.

What about infrastructure?

- As a "major development partner" of Bangladesh, India is funding several infrastructure and connectivity projects. Since 2010, India has extended Lines of Credits worth over \$7 billion.
- In 2023, they inaugurated the Akhaura-Agartala rail link that connects Bangladesh and the northeast through Tripura. The link has given India access to Chattogram and Mongla ports in Bangladesh for the movement of cargo. It is likely to boost small-scale industries and develop Assam and Tripura.
- In the energy sector, Bangladesh imports nearly 2,000 megawatts of electricity from India.
- The BIMSTEC Master Plan for Transport Connectivity focuses on connecting major transport projects in India, Bangladesh, Myanmar and Thailand, thereby establishing a shipping network.
- India's attention will primarily be directed towards the Matarbari Port, located about 100 km from Tripura, which Bangladesh is building. The port will establish a crucial industrial corridor linking Dhaka and the northeast part of India.

What are the points of tension?

- The looming Teesta dispute will take centre-stage in the agenda of the Hasina-led government. The issue revolves around the sharing of Teesta's waters, with Bangladesh seeking an equitable distribution. Another contentious matter is the Rohingya issue.
- The Hasina government aims for the peaceful repatriation of Rohingyas to Myanmar, but its talks with the military junta have been unsuccessful so far. Bangladesh seeks India's cooperation to influence Myanmar, but the Modi government, which has ties with the junta, asserts that it will deport Rohingyas from its mainland.
- Cross-border terrorism and infiltration are additional threats to internal security. The rise of majoritarian forces adds another layer to the complex landscape.
- While violence against Muslims has increased in India in the past few years, PM Hasina has stood at the forefront to condemn the attacks and express displeasure over comments by Indian leaders on "illegal" immigrants.

What about global ties?

- The U.S. has been vocal in its criticism of the Awami League government, exerting pressure on Sheikh Hasina over "democratic backsliding".
- In 2021, the Biden administration slapped sanctions on a Bangladeshi anti-crime and anti-terrorism task force, citing human rights violations, and escalated tensions by announcing a policy to restrict visas for Bangladeshis it believed to be responsible for undermining the election process in the country.
- Adding to India's concerns is the deepening relationship between Bangladesh and China,

marked by the substantial Chinese investments in infrastructure in recent years.

- China built 12 highways, 21 bridges and 27 power and energy projects in Bangladesh.

CABINET APPROVES SIGNING OF A MOU BETWEEN INDIA AND OMAN



Why in news?

- The Union Cabinet was apprised of a Memorandum of Understanding (MoU), signed between the Ministry of Electronics and Information Technology of India and the Ministry of Transport, Communications and Information Technology of the Sultanate of Oman on cooperation in the field of Information Technology.

Key Highlights:

- The MoU intends to promote comprehensive cooperation between the Parties through mutual support, sharing of technologies, information and investments in the field of Information Technology.
- The MoU shall come into effect from the date of signature of the Parties and shall remain in force for a period of 3 years.
- Both G2G and B2B bilateral Cooperation in the field of Information Technology will be enhanced.
- MoU envisages improved collaboration leading to employment opportunities in the field of IT.

Background:

- MeitY has been mandated to promote international cooperation in emerging and frontier areas of Information and Communications Technology (ICT) under bilateral and regional frameworks of cooperation.
- MeitY is collaborating with a number of countries and multilateral agencies for fostering bilateral and multilateral cooperation in the ICT domain.

ECONOMY

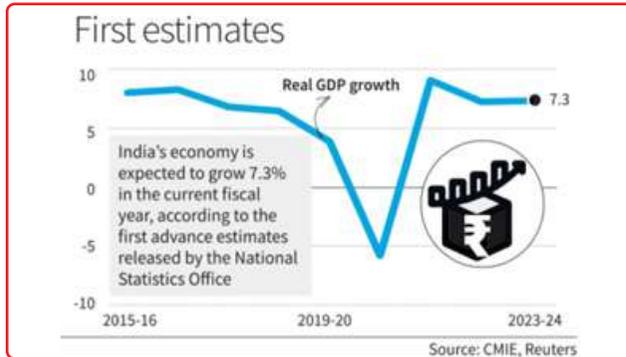
INDIA GDP IS ESTIMATED TO GROW BY 7.3 PERCENT, SAYS NSO

Why in news?

- India's real GDP growth in 2023-24 is estimated at 7.3%, compared to 7.2% a year ago, as per the first

advance estimates of national income released by the National Statistical Office (NSO) recently.

- It assumed the economy will outperform the 7% uptick recently projected by the Reserve Bank of India (RBI).



Key Highlights:

- With GDP growth in the first half of 2024 clocking 7.7%, the NSO's advance estimates, that rely on data for the first six to eight months of a year and are helpful in the Union Budget formulation, indicate the second-half growth will be about 6.9%-7%.
- The NSO expects the growth in Gross Value Added (GVA) in the economy to ease slightly from 7% in 2022-23 to 6.9% this year, and pegs nominal GDP growth at 8.9% compared to the 10.5% Budget estimate. This could translate into the fiscal deficit breaching the year's 5.9% of GDP target to hit around 6%, economists cautioned.
- GVA growth for the farm sector is estimated to more than halve from 4% a year ago to 1.8% this year, as is the case for Trade, Hotels, Transport, Communication and Services.

Concerns:

- The concerning aspect in the GDP data is the weak consumption growth at 4.4%. This would be the slowest consumption growth in the past two decades barring the pandemic year.
- The NSO said the share of private final consumption expenditure in GDP is expected to drop this year to 56.9%, from 58.5% in 2022-23.

INDIAN RAILWAYS TO ACHIEVE MISSION NET ZERO CARBON EMISSION

Why in news?

- The Union Cabinet was apprised of signing of Memorandum of Understanding between India and United States for International Development/India (USAID/India) on June 14, 2023 for supporting Indian Railways to achieve Mission Net Zero Carbon Emission by 2030.

Details:

- The MoU provides a platform for Indian Railways to interact and share the latest developments and knowledge in the railway sector.



- The MoU facilitates utility modernization, advanced energy solutions and systems, regional energy and market integration and private sector participation and engagement, training and seminars/workshops focusing on specific technology areas like Renewable Energy, energy efficiency and other interactions for knowledge sharing.
- Earlier, USAID/India had also worked with IR focused on deployment of rooftop solar across railway platforms.

Key activity areas:

- Long-term energy planning including clean energy for Indian Railways.
- Develop an Energy Efficiency Policy and Action Plan for Indian Railway Buildings.
- Planning for clean energy procurement to achieve Indian Railway's net-zero vision.
- Technical support for addressing regulatory and implementation barriers.
- Bid design and bid management support for system-friendly, large-scale renewable procurement.
- Supporting Indian Railways in the promotion of e-mobility.
- Collaboratively host event, conferences, and capacity-building programs in the mentioned identified areas.

Revision/Amendment:

- Either participant may request in writing a revision, modification or amendment to all or any part of this MoU. Any revision, modification or amendment approved by the Participants will form part of the revised MoU.
- Such revision, modification or amendment will come into effect on such date as may be determined by the Participants.

Tenure:

- This Memorandum of Understanding is effective as of the date of signing and is expected to continue for a period of five year or until the effective end of South Asia Regional Energy Partnership (SAREP) whichever period is shorter.

Impact:

- The MoU has been signed to support India Railways in achieving Mission Net Zero Carbon Emission (NZCE) by 2030.

- This will help Indian Railways to reduce dependence on imported fuel such as Diesel, Coal etc. Deployment of Renewable Energy (RE) plants will give fillip to RE technology in the country.
- This will help in development of local ecosystem which subsequently gives boost to local product development.

Expenditure involved:

- Technical assistance for the services under this MoU is intended to be provided by USAID under the SAREP initiative.
- This MoU is not an obligation of funds or a commitment of any kind, and it is non-binding. This does not involve any financial commitment from Indian Railways.

DGCA REVISES DUTY NORMS FOR PILOTS, ALLOWS MORE REST



Why in news?

- Recently, the Directorate General of Civil Aviation (DGCA) has made significant changes in the regulations pertaining to Flight Duty Time Limitations (FDTL) for flight crew, in line with the international best practices.
- These regulations have been instrumental in managing fatigue related aviation safety risks for more than a decade now.

Key Highlights:

Extended Weekly Rest Periods for flight crew:

- The revised regulations mandate increased weekly rest periods from 36 hours to 48 hours for flight crew, thus ensuring sufficient time for recovery from cumulative fatigue.

Night Duty:

- The definition of night has been amended which now covers the period of 0000-0600 hours in the revised regulations vis-à-vis the period of 0000-0500 hours under the previous regulations.
- This enhancement of one hour during early morning will ensure adequate rest and also align the night duty period which encompasses Window of Circadian Low (WOCL) from 0200-0600 hours i.e. the time during

which the circadian body clock cycle is at its lowest in terms of alertness.

Maximum Flight Time, Maximum Flight Duty Periods and Number of Landings during night:

- The revised regulations have taken into consideration different types of operations across time zones.
- The maximum flight time & maximum flight duty period for flight operations encroaching night have been restricted to 8 hours flight time & 10 hours flight duty period respectively and the number of landings have been limited to only two landings as compared to maximum permissible 6 landings under previous regulations during night operations, thus enhancing flight safety.
- In addition, DGCA has mandated that all airline operators shall submit quarterly fatigue reports after analysis, including the Action Taken on such reports. Further, it has been stipulated that the fatigue reports shall follow a non-punitive and confidentiality policy.

FRMS:

- DGCA further envisages to the adoption of a new regime of fatigue management i.e. Fatigue Risk Management System (FRMS) going forward.
- The revised FDTL regulation is a stepping stone towards FRMS implementation in India. FRMS is a data-driven approach to enhance monitoring and reporting of flight crew fatigue.
- The collaboration of various aviation stakeholders such as regulator, airline operators, flight crew etc. will be required to implement stringent monitoring, record keeping and reporting to ensure adherence to a FRMS regime in future once the readiness to transition to the FRMS framework has been diligently demonstrated by all stakeholders.

Implementation:

- The revised FDTL regulations are effective forthwith and the airline operators are required to comply with the revised regulations latest by 1st June, 2024.
- This will ensure sufficient time for the airline operators to adapt to the changes while taking into account the logistics, system changes and consequential arrangements arising out of the amendments in revised FDTL regulations.

Way Forward:

- With the implementation of the revised FDTL regulations, the aviation sector aspires for safer skies.

WHAT ARE THE COMPLAINTS ABOUT DIGI YATRA?

Why in news?

- In December 2023, as air travel peaked in the holiday season, it was found that security personnel and private staff were collecting facial biometrics at airport entry gates without the consent or knowledge of passengers for the Digi Yatra app.



What are the complaints from air travellers?

- There was a surge in complaints from passengers using various airports about the “coercive and deceptive” manner in which both private staff and CISF personnel were enrolling them for Digi Yatra.
- CISF personnel at the entry gate of passenger buildings were asking travellers to scan their boarding pass and capturing their photos, following which they would provide consent on behalf of the passengers for registering for Digi Yatra without seeking permission or even informing them.

What is Digi Yatra? What are its objectives?

- The Digi Yatra initiative aims to promote digital processing of passengers for paper-less and seamless movement through various checkpoints at airports such as the entry gate, security check area and boarding gate.
- The Digi Yatra policy was unveiled by the Ministry of Civil Aviation in 2018 as an entirely voluntary programme.
- After some delay, it was rolled out from December 2022 at three airports, including Delhi’s Indira Gandhi International Airport. Today, it is present at 13 airports, and will be expanded to 24 more airports in 2024.

Digi Yatra app:

- The Digi Yatra app is not owned by the government, but by a consortium called the Digi Yatra Foundation whose shareholders comprise the Airports Authority of India and five private airports, including Delhi, Mumbai, Bengaluru, Hyderabad and Kochi.
- The government does not provide any funding for its implementation, and airports are required to spend from their kitty.
- The implementation involves an app that passengers can download. They need to provide their name, mobile, email address and Aadhaar document to register. They also have to upload a selfie so that their image can be matched with the one on the Aadhaar.
- These two steps lead to the creation of a digi yatra travel id. When passengers upload their air tickets, the digi yatra id gets updated with their travel details.
- At airports, passengers scan their boarding pass at an e-gate and look into a camera that captures their image. Once the face verification is successful, the

e-gate opens. This also creates the passenger data-set which is a combination of their facial scan and PNR.

- This data is then used as a single token at the remaining check points so that a passenger can simply zip through them with a mere facial scan without the need to produce a boarding pass.

What are the issues about implementation?

- The government maintains that there is no central storage of a passenger’s data, which is encrypted and stored in a secure wallet on his or her mobile device. Though the data is shared with the departure airport on the day of travel, it is purged within 24 hours.
- According to a detailed analysis by the Internet Freedom Foundation, the Digi Yatra policy states that the airports using the Digi Yatra Biometric Boarding System will adhere to the data protection law as mandated by the Government of India.
- But the Digital Personal Data Protection Act, 2023 was passed by Parliament in August 2023 and the rules are yet to be framed.
- The Bill has also been criticised for giving the government broad powers to exempt any of its agencies from all its provisions. Additionally, these exemptions are also granted in the Digi Yatra policy.

GDP GROWTH IN MOST COUNTRIES NEITHER SUSTAINABLE, NOR INCLUSIVE, WEF STUDY



Why in news?

- ‘The Future of Growth Report’ released recently by the World Economic Forum Annual Meeting 2024 called for a new approach to economic growth that balances efficiency with long-term sustainability and equity, examining speed and quality together.
- Most economies are growing in ways that are neither sustainable nor inclusive and are limited in their ability to absorb or generate innovation and minimise their contribution and susceptibility to global shocks.

Key Highlights:

- High-income economies score high on innovation and inclusion, while lower-income economies on sustainability, said the report that took a holistic look at GDP alongside the quality of growth across 107 economies.

- Among the lower middle-income economies, India and Kenya scored high on sustainability, Jordan on innovativeness; Vietnam on inclusiveness; and the Philippines on resilience.
- Common challenges preventing a stronger balanced growth performance of this group included technology absorption, lack of social safety nets, insufficient investment in renewable energy, and insufficient healthcare system capacity.
- The report proposes a new way for assessing economic growth that balances efficiency with long-term sustainability, resilience, and equity, as well as innovation for the future, aligning with both global and national priorities.
- At an individual level, none of the 107 economies covered by the report attained a score higher than 80 on any of the framework's four dimensions.

Economic slowdown:

- The report highlighted a significant economic slowdown, estimated to fall to the lowest rate in three decades by 2030, amid ongoing economic and geopolitical shocks.
- This downturn is exacerbating a range of interconnected global challenges, including the climate crisis and a weakening social contract, which are collectively reversing progress in global development.

REC RECEIVES SCOPE EXCELLENCE AWARD FOR DIGITALIZATION



Why in news?

- REC Limited, a Maharatna Central Public Sector Enterprise under the Ministry of Power and a leading NBFC, has been honored with the Scope Excellence Award in the category of Special Institutional Category (Digitalization).
- The award acknowledges REC Limited's unwavering commitment to the digitalization of its workplace and the promotion of best practices in establishing a paperless office.

SCOPE:

- SCOPE was established in 1973 as an apex body of Public Sector Enterprises (PSEs), and is dedicated to

promoting competitiveness and excellence within the PSE sector.

- The SCOPE Excellence Award recognizes and commemorates exemplary performances of Public Sector Enterprises.

About REC Limited:

- REC is a 'Maharatna' CPSE under the Ministry of Power, and is registered with RBI as Non-Banking Finance Company (NBFC), and Infrastructure Financing Company (IFC).
- REC finances the entire Power-Infrastructure sector comprising Generation, Transmission, Distribution, Renewable Energy and new technologies like Electric Vehicles, Battery Storage, Pumped Storage projects, Green Hydrogen and Green Ammonia projects.
- More recently, REC has also diversified into the Non-Power Infrastructure sector comprising Roads & Expressways, Metro Rail, Airports, IT Communication, Social and Commercial Infrastructure (Educational Institution, Hospitals), Ports and Electro-Mechanical (E&M) works in respect of various other sectors like Steel and Refinery. REC Ltd. provides loans of various maturities to State, Central and Private Companies for creation of infrastructure assets in the country.
- REC Ltd. continues to play a key strategic role in the flagship schemes of the Government for the power sector and has been nodal agency for Pradhan Mantri Sahaj Bijli Har Ghar Yojana (SAUBHAGAYA), Deen Dayal Upadhaya Gram Jyoti Yojana (DDUGJY), National Electricity Fund (NEF) Scheme which resulted in strengthening of last mile distribution system, 100% village electrification and household electrification in the country.
- REC has also been made the nodal agency for certain States and Union Territories for the Revamped Distribution Sector Scheme (RDSS). The loan book of REC stands at Rs 4.74 Lakh Crore and Net Worth at Rs. 63,117 crores on 30 September, 2023.

CCI APPROVES MERGER OF FINCARE AND AU SMALL FINANCE BANK LIMITED (AU)



Why in news?

- The Competition Commission of India (CCI) has approved the merger of Fincare Small Finance

- Bank Limited (Fincare) and AU Small Finance Bank Limited (AU).
- The Proposed Combination involves the merger of Fincare and AU, with AU being the surviving entity (merged entity). The shareholders of Fincare will be allotted shares in the merged entity, post the Proposed Combination.

About AU:

- AU is a banking company which provides personal and commercial banking services (including provision of deposits, loans and advances, debit and credit card services, institutional banking and digital banking services).
- AU is also licensed to transact business under AD-II bank category (foreign exchange). AU is also engaged in provision of ancillary functions such as distribution of insurance and investment products such as mutual funds, and portfolio management services.

Fincare:

- Fincare is a banking company and provides deposit services (such as savings account, current account, fixed deposits, recurring deposits), lending services (including retail and microfinance loans), and digital banking services.
- Fincare also provides certain miscellaneous services such as distribution of insurance products.

INVESTMENT FORUM FOR ADVANCING CLIMATE RESILIENT AGRIFOOD SYSTEMS IN INDIA LAUNCHED



Why in news?

- Recently, NITI Aayog, Ministry of Agriculture and Farmers' Welfare (MoA&FW) and Food and Agriculture Organization (FAO) of the United Nations jointly launched the 'Investment Forum for Advancing Climate Resilient Agrifood Systems in India' in New Delhi.

Details:

- This initiative aims to develop an investment and partnership strategy to advance climate resilient agrifood systems among the government, private sectors, and farmers' organizations and financial institutions in India.

- The two-day meet paved the way for discussions and deliberations among key stakeholders, and their perspectives on national priorities, investment opportunities, partnership, technical support and cooperation.

Key areas:

- The Forum facilitated discussions and deliberations on six key areas namely,
 - a) Climate resilient agriculture (experiences and pathways)
 - b) Digital infrastructure and solutions
 - c) Financing climate resilient agrifood systems (domestic and global)
 - d) Climate resilient value chains
 - e) Production practices and inputs for climate resilience and
 - f) Gender mainstreaming and social inclusion for climate resilience.

Implications for climate change:

- Climate change has profound implications for India, particularly affecting its economically vulnerable rural population which is largely dependent on climate sensitive agricultural livelihoods.
- Indian agriculture is susceptible to extreme temperatures, droughts, floods, cyclones, and soil salinity. Climate mainstreaming into agrifood systems requires much larger investments from global climate finance, domestic budgets, and the private sector.

Significance:

- This forum facilitated the identification of national priorities and policy platforms for financing climate resilient agrifood systems.
- It facilitated key stakeholders to provide insights on several opportunities that can be leveraged through regional collaboration on climate-smart food system initiatives and suggest probable arrangements to maximize resource consolidation, route catalytic findings and support large-scale climate advocacy campaigns.

SECURITY

EXERCISE DESERT CYCLONE



Why in news?

- The UAE Land Forces contingent comprising 45 personnel arrived in India to participate in the 1st edition of the India - UAE Joint Military Exercise 'Desert Cyclone'.

Details:

- The Exercise is scheduled to be conducted in Mahajan, Rajasthan from 2nd to 15th January 2024.
- The UAE contingent is being represented by troops from the Zayed First Brigade.
- The Indian Army contingent comprising 45 personnel is being represented mainly by a Battalion from the Mechanised Infantry Regiment.

Aim:

- The aim of the Exercise is to enhance interoperability in Sub-conventional Operations including Fighting in Built-Up Area (FIBUA) in desert/ semi desert terrain under Chapter VII of the United Nations Charter on Peace Keeping Operations.

Key Highlights:

- The Exercise will enhance cooperation and interoperability between both the sides during Peace Keeping Operations.
- Drills planned to be rehearsed during Exercise 'Desert Cyclone' include Establishment of a Joint Surveillance Centre, Cordon and Search Operation, Domination of Built-Up Area and Heliborne Operations.
- The Exercise will also foster collaborative partnership and help in sharing best practices between the two sides.

Way Forward:

- Exercise 'Desert Cyclone' signifies further strengthening of bonds of friendship and trust between India and the UAE.
- The Exercise aims to achieve shared security objectives and foster bilateral relations between two friendly nations.

**IAF PULLS OFF NIGHT LANDING AT
KARGIL ADVANCED LANDING GROUND
WITH TERRAIN MASKING**

**Why in news?**

- For the first time, the Indian Air Force (IAF) has carried out a night landing at the unidirectional

Kargil Advanced Landing Ground (ALG) with special commandos on board.

- The aircraft used was a C-130J Super Hercules, which employed terrain masking en route to avoid detection.

Details:

- This was a major achievement for the Indian military that showcases capabilities to land for operations and humanitarian assistance and disaster relief (HADR) at night and during the day.
- While such ALG landings have been done earlier and are part of the practice, this is the first time when a night landing has been undertaken.

Challenges:

- Kargil ALG is at about 10,500 feet and the approach is unidirectional.
- It is surrounded by hills, which gives limited space for manoeuvring. Hence, pulling off a night landing is very difficult.

ALGs in India:

- Besides the Kargil ALG, there is also one at Nyoma, is being converted into a full-fledged air base.
- India also has Daulat Beg Oldie (DBO) and Fukche ALG in Ladakh.
- The full exploitation of the ALGs is crucial for operational needs and this was felt during the ongoing stand-off with China at the Line of Actual Control (LAC).

**SUBHASH CHANDRA BOSE AAPDA
PRABANDHAN PURASKAR-2024**

**Why in news?**

- For the year 2024, 60 Parachute Field Hospital, Uttar Pradesh, in the Institutional category, has been selected for the Subhash Chandra Bose Aapda Prabandhan Puraskar-2024 for its excellent work in Disaster Management.

About Subhash Chandra Bose Aapda Prabandhan Puraskar:

- The Government of India has instituted an annual award known as Subhash Chandra Bose Aapda Prabandhan Puraskar to recognize and honour the invaluable contribution and selfless service rendered

- by individuals and organizations in India in the field of disaster management.
- The award is announced every year on 23rd January, the birth anniversary of Netaji Subhash Chandra Bose.
 - The award carries a cash prize of Rs. 51 lakh and a certificate in case of an institution and Rs. 5 lakh and a certificate in case of an individual.

Why 60 Parachute Field Hospital, Uttar Pradesh has been awarded?

- 60 Parachute Field Hospital, Uttar Pradesh, was established in 1942.
- It is the sole airborne medical establishment of the Indian Armed Forces, recognized for its exceptional service in various global crisis. The primary mission includes Humanitarian Assistance and Disaster Relief (HADR) operations during natural calamities, nationally and internationally, both in time of peace and war.
- It had provided medical assistance during the Uttarakhand floods (2013), Nepal Earthquake under the operation name 'Maitri' (2015) and Indonesian Tsunami as part of operation Samudra Maitri (2018).
- Recently, in response to the 7.8 magnitude earthquake in Turkey and Syria in February 2023, the unit rapidly assembled a 99-member team and established India's pioneering level-2 medical facility in Turkey overcoming resource constraints and language barrier to set up a 30 bed hospital in Hatay province's school building.
- The unit provided a wide range of medical services, including rescue, triage, surgery, dental treatment, X Ray and lab facilities and offered care to 3600 patients during a 12 day period as a part of 'Operation Dost'.

ENVIRONMENT

RHINOS RETURN TO ASSAM LAOKHOWA BURACHAPORI SANCTUARIES AFTER 40 YEARS



Why in the news?

- Rhinos have returned to Laokhowa and Burachapori wildlife sanctuaries of Assam, 40 years after the population of pachyderms in the area was wiped out due to poaching.

- These protected areas had also witnessed human encroachment over the years, which was cleared by the authorities in 2023.

Key Highlights:

- A total of 51.7 sq km of forest cover has been retrieved through eviction drives in 2023.
- Two rhinos have been spotted in the Laokhowa-Burachapori wildlife sanctuaries, which are part of 'Greater Kaziranga', after almost a gap of 40 years.
- The Laokhowa-Burachapori forest in Nagaon district had a population of 45-50 rhinos till 1983.
- Other than rhinos, the protected area also has 10 tigers.

Poaching:

- Large-scale encroachment and poaching wiped them out although stray rhinos from Orang National Park across the Brahmaputra River and the Kaziranga National Park to the east were known to enter the WLS very briefly.
- The eviction drive was carried out from February 13 to 15 last year, which led to a clearing of 1,282 hectares of forest land and 817 hectares of unsurveyed government land.

IIT DELHI TEAM MAKES FIRST HI RES LANDSLIDE RISK MAP FOR INDIA



Why in news?

- In late 2023, torrential rain during the northeast monsoon triggered heavy floods and landslides in multiple States in North India, killing hundreds of people.
- Given the number of fatalities due to landslides in India, a national landslide susceptibility map can help identify the most dangerous areas and help allocate resources for mitigation strategies better.
- Manabendra Saharia, an assistant professor in the civil engineering department and head of the HydroSense Lab at IIT Delhi and his team made one.

Factors:

- They collected information on the factors that rendered an area susceptible to landslides. Some of them are soil cover (or the type of soil in the area), the number of trees covering the area, and how far it is from any roads or mountains.

- The fewer trees there are in a place, the closer it is to road-building activity, and the steeper the local slope, the more unstable the place will be and thus more prone to landslides.
- They gathered information from across the country on 16 such factors, which they called landslide conditioning factors. They said GeoSadak, an online system that has data on the national road network in India, was particularly helpful because it displayed data on roads even outside cities.

Landslide map:

- After all the analyses, and with the help of GSI's extensive collection of landslide data, they developed a high-resolution landslide susceptibility map.
- Here, they could plot the susceptibility at a resolution of 100 m. That is, they estimated the susceptibility for each 100 sq. m parcel across the whole country.
- This map, which they called the 'Indian Landslide Susceptibility Map', is the first of its kind by virtue of being on a national scale, leaving out no locations in the country.

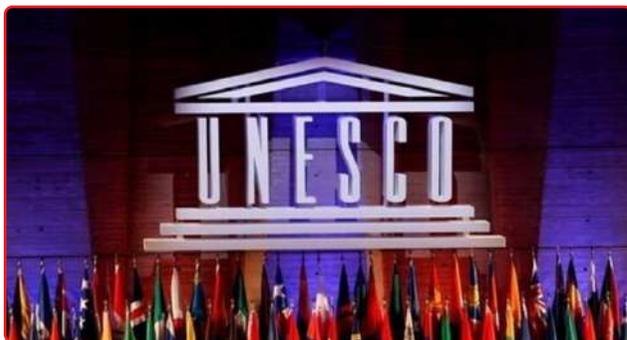
Early warning system:

- The map acknowledged some well-known regions of high landslide susceptibility, like parts of the foothills of the Himalaya, the Assam-Meghalaya region, and the Western Ghats.
- It also revealed some previously unknown places with high risk, such as some areas of the Eastern Ghats, just north of Andhra Pradesh and Odisha.
- The map is expected to be useful for organisations involved in investigating and mitigating landslides, like the GSI, the Ministry of Mines, and the National Disaster Management Authority.

Way Forward:

- Dr. Saharia and his group are also in the process of building an infrastructure vulnerability map – a cartogram that will depict the stretches of roads, railways, and buildings that are particularly vulnerable to landslides.

IN A FIRST, INDIA SET TO CHAIR, HOST UNESCO WORLD HERITAGE COMMITTEE



Why in news?

- In a historic development, India is set to chair and host United Nations Educational, Scientific and Cultural

Organization (UNESCO)'s World Heritage Committee from July 21 to 31, 2024 in New Delhi.

- The opportunity will mark a momentous occasion for India's cultural and historical legacy. This is the first time a country will lead and host the committee.

About UNESCO:

- UNESCO is a specialised agency of the United Nations (UN) that aims to promote world peace and national security through international cooperation in education, arts, science and culture.
- It is also a member of the United Nations Sustainable Development Group (UNSDG), a coalition of UN agencies and organizations aimed at fulfilling the Sustainable Development Goals (SDGs).
- UNESCO's Headquarters are located in Paris and the Organization has more than 50 field offices around the world.
- It has 193 Members and 11 Associate Members and is governed by the General Conference and the Executive Board.

About UNESCO's World Heritage Committee:

- The UNESCO's World Heritage Committee, which meets once a year and consists of representatives from 21 member states, plays an important role in bringing new additions to the prestigious list of UNESCO World Heritage Sites.

WHY DID NORTH INDIA FOG HEAVILY IN LAST WEEKS OF 2023?



Why in news?

- Most of North India also experienced a dense fog that reduced visibility in many areas to as little as 50 metres for several days.

Where was fogging reported?

- Haryana, including Chandigarh, plus isolated pockets of Uttarakhand, Uttar Pradesh, Bihar, Rajasthan, and Madhya Pradesh reported fog with visibility reduced to under 200 metres.
- Other States including Jammu & Kashmir, Himachal Pradesh, Odisha, Chhattisgarh, Jharkhand, and Uttarakhand also reported fog for a few hours in the morning.

What is fog?

- A fog is a collection of small droplets of water produced when evaporated water has cooled down and condensed.
- Fog is nothing but a thick cloud, but very close to the earth's surface. For a thick fog to form, temperatures should be lower and abundant moisture should be available near the surface.
- Fog materialises whenever there is a temperature disparity between the ground and the air. This happens frequently during Indian winters, fog is created when the temperature drops at night and in the early morning, aerosols present in the atmosphere condense. High humidity, combined with an ample presence of water vapour or moisture, encourages foggy conditions.
- The process by which it cools plays a pivotal role in the formation of fog. One primary mechanism contributing to fog formation is called infrared cooling. It typically occurs when the weather is transitioning from summer to winter.
- In the summer, the ground absorbs radiation from the sun, becomes warmer, and moistens the air passing over it. When cooler weather kicks in, this mass of warm, moist air comes in contact with processes that cool it.
- The 'collision' prompts the water vapour in the air to condense rapidly, giving rise to fog. Another type of fog, known as radiation fog, is prevalent and occurs when an unseasonably warm day with high humidity is followed by rapidly dropping temperatures.
- The specific type of fog, its duration, and its effects are contingent on various environmental conditions.

Why is northern India prone to fogging?

- The entire Indo-Gangetic plains are prone to formation of fog during winter season, as all the conditions; low temperatures, low wind speed, moisture availability and plenty of aerosols are present in this region.
- Moisture incursion into this region can happen once a Western Disturbance, a precipitational pattern that brings rain to north India during winter months moves across northern parts. Sometimes, moisture incursion can happen from the Arabian Sea also.

CHANGING ENVIRONMENT CAUSED THE DEMISE OF LARGEST PRIMATE

Why in news?

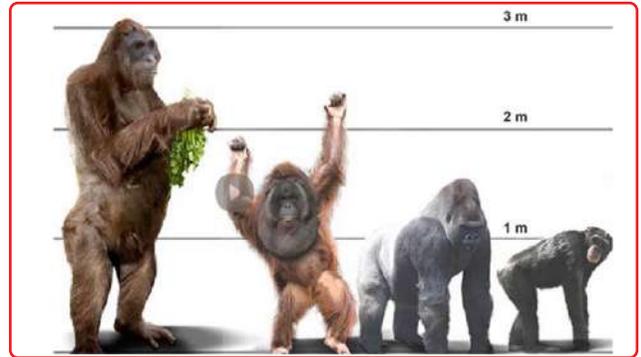
- The extinction of the largest known primate, a giant ape from China, resulted from its struggle to adapt to environmental changes.
- These findings fill a key gap in understanding of why this species failed to survive where other, similar primates persisted.

Gigantopithecus blacki:

- Gigantopithecus blacki was a species of great ape

found in China between 2 million and 330 thousand years ago, after which the species became extinct.

- With an estimated height of 3 m and weight of 200–300 kg, it is thought to be the largest primate to ever exist on Earth.
- The distribution of the most recent fossils suggests that the geographical range of *G. blacki* markedly reduced before their extinction. An exact timeline and reason for this decline has yet to be established.



Key Observations:

- The researchers collected and dated fossil samples from 22 caves in southern China. Analyses of the teeth of *G. blacki* and *Pongo weidenreichi* (their closest primate relative) were used to determine changes in diet or behaviour of the species within the extinction window, in conjunction with pollen and stable isotope analysis to reconstruct the environment.
- Pollen analysis indicates that 2.3 million years ago, the environment was composed of dense forests with heavy cover, conditions to which *G. Blacki* was well-suited.
- Before and during the extinction window (295–215,000 years ago), changes in forest plant communities led to a transition in the environment with open forests dominating the landscape.
- The transition to open forest is reflected in the dental analyses, which suggest that the diet of *G. Blacki* became less diverse and with less regular water consumption; accompanied by indications of increased chronic stress among *G. blacki* over this period.
- This is in contrast to *P. weidenreichi*, which shows much less stress and better adaption of its dietary preferences to changing conditions over this same period.
- The fossil numbers support these hypotheses, showing a decline in the number and geographical spread of *G. blacki* fossils in the record relative to *P. weidenreichi* by 300 thousand years ago.

Conclusion:

- The authors present a precise timeline for the demise of *G. blacki* that suggests it struggled to adapt to a changing environment compared to its primate peers.

NEW BUTTERFLY SPECIES ENDEMIC TO WESTERN GHATS DISCOVERED IN KARNATAKA



Why in news?

- A new species of silverline butterfly has been identified in the biodiversity hotspots in India's Western Ghats.
- This unique species, named *Cigaritis conjuncta* or the "conjoined silverline", was first spotted in 2008 but came under extensive research in 2021.

Details:

- The discovery was made by a team of scientists from the National Centre for Biological Sciences (NCBS-TIFR) in Bengaluru, in collaboration with researchers from the Indian Foundation for Butterflies Trust.
- The researchers found five male and four female specimens of the conjoined silverline butterfly in Honey valley, Kodagu district of Karnataka.

Characteristic features:

- On the upperside, nearly half of the top wing is black, and there's a shiny blue colour on the lower wings. There's an orange patch with two black spots on the lower wings. The outer edge of the top wing doesn't have any orange markings.
- On the underside, which is the side of the wings facing down, bands of colours are visible. The bands on the top wings are fused together without separation, and the lower wings have spots that are connected to form broad bands with irregular outlines.
- The underside also features bands with silver lines down the centre and thin black borders along the edges.

Spread:

- During their field research, the scientists identified 30 individuals of the conjoined silverline butterfly, which belongs to the Lycaenidae family.
- In India, there are 16 species of silverline butterflies, with 11 of them found in both peninsular India and Sri Lanka.
- While these butterfly species are widespread in India, some are limited to the Himalayan region.

Second endemic species:

- The newly described conjoined silverline butterfly is only the second endemic species discovered in the

Western Ghats and is primarily found in dense mid-elevation evergreen forests, indicating specialised habitat preferences.

- Although the conjoined silverline appears similar to other silverline butterflies from a distance, closer examination reveals distinct wing patterns that set it apart.
- This unique characteristic, consisting of fused bands on the underside of the wings, led to the species being named "conjoined silverline".

INDIA DOCUMENTS FIRST-EVER EVIDENCE OF RARE TIBETAN BROWN BEAR



Why in news?

- In a significant discovery, wildlife officials in India documented the first-ever evidence of a rare Tibetan Brown Bear (scientific name: *Ursus arctos pruinusos*), that was spotted in the northeastern region of the country.

- Camera traps captured the bear in December 2023 with its characteristic yellowish scarf-like collar that broadens from the shoulders to the chest in the Mangan district, Sikkim.

Characteristic feature:

- It is an omnivore with a diet that generally consists of marmots and alpine vegetation.
- This rare bear is very diverse from the more commonly found Himalayan Black Bear in terms of its appearance, habitat, and behaviour.

Habitat:

- It inhabits high-altitude alpine forests, meadows, and steppe above 4000 metres.
- The Tibetan brown bear, also known as the Tibetan blue bear, is one of the rarest subspecies of bears in the world and is seldom sighted in the wild.
- It is uniquely adapted to the extreme conditions of the Tibetan Plateau. Until now, there were only a few confirmed records from Nepal, Bhutan, and the Tibetan plateau.

Way Forward:

- The discovery of a rare Tibetan brown bear marks a significant moment for biodiversity in the region

and underscores the importance of preserving and protecting the state's precious wildlife.

NEW AMENDMENTS IN WILDLIFE TRADE RULES ENABLE ISSUING LICENCES FOR CERTAIN SCHEDULE II SPECIES



Why in news?

- The central government has excluded some species from the process of issuing licences for their wildlife trade in the revised rules that have come after four decades.

Details:

- In a government notification, Wild Life (Protection) Licensing (Additional Matters for Consideration) Rules, 2024, the government offered fresh guidelines for granting licences to stakeholders involved in snake venom, captive animals, trophy animals and stuffed animals.
- The revised notification came into effect on January 16, the first revision since 1983.
- The rules from 1983 prohibited issuing licences to trade in a wild animal categorised under Schedule I or Part II of Schedule II under the Wildlife Protection Act 1972. The licences were granted in exceptional cases with previous approval of the central government.

Key Highlights:

- With new guidelines in effect, the government has stated that, "No such licences shall be granted if it relates to any wild animals specified in the Schedule I to the Act, except with previous consultation of the central government."
- In additional matters to consider granting of licences, the authorised officers must consider the capacity of the applicant to handle the business concerned in terms of facilities, equipment and feasibility of premises for the business.
- The official has to note the source and manner in which the supplies would be obtained by the business involved, including the number of licences already issued in the concerned area.
- It further seeks considering the implications on hunting or trade of wild animals concerned in case of granting of the licence.

Earlier amendment:

- On earlier occasion in 2022, the central government in amendment of Wildlife Protection Act merged four schedules of wild animals in two reducing the six schedules to four.
- As per the revised amendments Schedule I includes animals requiring utmost protection while Schedule II has species needing comparatively lower protection.
- Plant species have been listed under Schedule II while Schedule IV is dedicated to species to be protected under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- Under the Wildlife Protection Act 1972, some of the animals listed under Schedule II include birds such as sparrows, bulbul, ducks, geese, owls, kites, eagles, falcons, primias, reptiles such as snakes, turtles, mammals such as deer, hare, rats, langur, and amphibians like geckos and frogs are listed.
- According to the World Wildlife Report 2020 about 6,000 species of flora and fauna were seized globally from 1999-2018.

WETLAND 'NATURE TOURISM' GETS A FILLIP



Why in news?

- The Union government has embarked on a mission to promote tourism at ecologically sensitive wetlands, better known as Ramsar sites, such as the Chilika lake in Odisha and Sultanpur bird sanctuary in Haryana. The focus of the initiative would be to shift these fragile wetlands from high-value tourism to nature tourism by directly supporting conservation action and letting local communities and economies take the lead.

Ramsar site:

- A Ramsar site is a wetland designated to be of international importance under an environmental treaty signed in February 1971 at Ramsar, Iran under the auspices of UNESCO. .
- As of now, 16 Ramsar sites have been identified under the initiative and five of them have been taken up as a pilot project for skill development of the facilitators, tourism service providers, and stakeholders in and around these sites.

➤ These five wetlands are Sultanpur National Park (Haryana), Bhitarkanika Mangroves (Odisha), Chilika lake (Odisha), Sirpur (Madhya Pradesh) and Yashwant Sagar (Madhya Pradesh).

Amrit Dharohar Capacity Building Scheme:

- The initiative to develop these sites has been taken by the Union Tourism Ministry and the Ministry of Environment, Forest and Climate Change under the Amrit Dharohar Capacity Building Scheme, 2023.
- The Amrit Dharohar initiative, part of the 2023-24 Budget announcement, was launched in June 2023 to promote unique conservation values of Ramsar sites in the country while generating employment opportunities and supporting local livelihoods.

Livelihood opportunities:

- The scheme is being implemented in convergence with various Union government Ministries and agencies, State wetland authorities, and a network of formal and informal institutions and individuals.
- The aim is to enhance livelihood opportunities for local communities through harnessing the nature-tourism potential of such sites.
- The Tourism Ministry and the Ministry of Environment, Forest and Climate Change are training facilitators, tourism service providers, stakeholders for strengthening of nature tourism at Ramsar sites in association with the State Tourism Department.

Training programme:

- As part of the mission, a total of 30 participants have been trained for 15 days under the Alternative Livelihood Programme (ALP) at Sultanpur (Haryana), Yashwant Sagar and Sirpur (Madhya Pradesh).
- At Bhitarkanika and Chilika in Odisha, two training programmes of 15 days each, the ALP and Paryatan Navik Certificate (boatman certification for tourism) will soon be completed.
- A total of 60 participants (30 for each course) are being trained at these sites.

ACME AND JAPANESE IHI TO SUPPLY GREEN AMMONIA FROM INDIA TO JAPAN



Why in news?

- Recently, ACME Group, a leading renewable energy

company in India, and IHI Corporation, a Japanese integrated heavy industry group, signed an offtake term sheet for supply of green ammonia from Odisha, India to Japan.

- Under this agreement, ACME and IHI plan to compete with the relatively cheaper but less environment-friendly blue ammonia supply with the active support and incentives being offered by the Central Government of India under National Green Hydrogen Mission (NGHM) and State Government of Odisha.

Key Highlights:

- The Green Ammonia will be produced at ACME's 1.2 MMTPA Green Ammonia project being developed at Gopalpur in the state of Odisha.
- Total investment for 1.2 MMT per annum plant will be 5 billion USD.
- The term sheet between IHI and Acme covers the supply of 0.4 MMTPA (million metric tons per annum) of green ammonia from Phase-1 of Odisha project in Gopalpur on a long-term basis.
- Both companies wish to partner across the value chain, starting from production to logistics, supply to the Japanese customers and to create the market for green ammonia for use in a range of applications in power generation and various industrial uses in Japan to reduce the overall emissions.

About ACME:

- ACME Group is one of the largest renewable Independent Power Producer in India with a portfolio of more than 5 GW of renewable energy capacity under operation and various stages of implementation.
- In 2021, Acme built what is perhaps the world's first Green Ammonia plant in Bikaner, Rajasthan.
- It is developing several green hydrogen and ammonia projects in India, Oman and USA with an aim to have a portfolio of c. 10 MMTPA of green ammonia or equivalent hydrogen/derivatives by 2032.

About IHI:

- IHI is a preeminent Japanese integrated heavy industry group that originated in 1853 and leveraged its shipbuilding technology to expand into onshore machinery, bridge, plant, aero-engine, and other manufacturing fields.
- IHI has provided various solutions in the Resource, Energy and Environment; Social Infrastructure; Industrial Systems and General-Purpose Machinery; and Aero Engine, Space and Defence business segments.
- It is developing technology for ammonia firing and is constructing a carbon-free fuel ammonia supply chain to help decarbonise the economy.

SCIENCE & TECHNOLOGY

ISRO LAUNCHES FUEL CELL TO TEST POWER SOURCE FOR FUTURE BHARTIYA SPACE STATION



Why in news?

- The Indian Space Research Organisation (ISRO) has successfully launched a Fuel Cell Power System (FCPS) designed to test the power source for the upcoming Indian Space Station. The experiment was launched aboard the PSLV-C58 mission that carried the XPoSat observatory to space.

About FCPS:

- Developed by the Vikram Sarabhai Space Center (VSSC), a part of ISRO, this fuel cell is a new technology to pioneer a sustainable and efficient power source in space exploration.
- The FCPS was launched aboard the PSLV Orbital Experimental Module (POEM), which is essentially the fourth stage of the Polar Satellite Launch Vehicle.
- Initially placed into a 650 km orbit with the X-ray Polarimeter Satellite (XPoSAT) mission, the POEM fourth stage was subsequently lowered to a 350 km orbit through a series of controlled maneuvers.
- This strategic lowering of the orbit was crucial for maintaining the stability required for the onboard experiments, including the FCPS.

Advantage:

- This innovative fuel cell technology is expected to be a game-changer for long-duration space missions.
- Unlike traditional power systems, fuel cells offer the advantage of converting chemical energy from fuels directly into electricity through electrochemical reactions, providing a much longer supply of electrical energy.

Potential:

- ISRO's move to test the FCPS in the lower orbit is part of a broader strategy to validate technologies that will be critical for the success of the proposed Indian Space Station.
- Slated to be established in Low Earth Orbit at an altitude ranging from 120 to 140 km, the space

station is expected to serve as a platform for various microgravity experiments, contributing significantly to space science and technology.

Way Forward:

- The successful deployment and testing of the FCPS are indicative of ISRO's forward-thinking approach to space exploration.
- By harnessing the potential of fuel cell technology, ISRO is not only paving the way for its ambitious space station project but also setting a precedent for sustainable practices in space missions.

ISRO PSLV C58 XPOSAT MISSION



Why in news?

- The Indian Space Research Organisation (ISRO)'s PSLV-C58 has launched XPoSAT Satellite into an Eastward low inclination orbit on January 01, 2024.
- After injection of XPoSAT, the PS4 stage was re-started twice to reduce the orbit into 350 km circular orbit to maintain in 3-axis stabilized mode for Orbital Platform (OP) experiments.
- The PSLV Orbital Experimental Module-3 (POEM-3) experiment will be executed meeting the objective of 10 identified payloads, supplied by ISRO and IN-SPACE.

XPoSat:

- XPoSat (X-ray Polarimeter Satellite) is the first dedicated scientific satellite from ISRO to carry out research in space-based polarisation measurements of X-ray emission from celestial sources.
- The Satellite configuration is modified from the IMS-2 bus platform.
- The Configuration of the mainframe systems are derived based on the heritage of IRS satellites.

Payloads:

- It carries two payloads namely POLIX (Polarimeter Instrument in X-rays) and XSPECT (X-ray Spectroscopy and Timing).
- POLIX is realized by Raman Research Institute and XSPECT is by Space Astronomy Group of URSC.
- The primary payload, POLIX will measure the degree and angle of polarisation in the medium X-ray energy range of 8-30 keV photons of astronomical origin.

⇒ The XSPECT payload will offer spectroscopic information in the energy range of 0.8-15 keV.

Objectives:

- ⇒ To measure polarisation of X-rays in the energy band 8-30keV emanating from about 50 potential cosmic sources through Thomson Scattering by POLIX payload.
- ⇒ To carry out long term spectral and temporal studies of cosmic X-ray sources in the energy band 0.8-15keV by XSPECT payload.
- ⇒ To carry out polarisation and spectroscopic measurements of X-ray emissions from cosmic sources by POLIX and XSPECT payloads respectively in the common energy band.

INDIAN AIR FORCE PILOTS TO TRAIN AT NASA FOR MISSION TO SPACE STATION



Why in news?

- ⇒ Indian Air Force pilots are slated to undergo advanced training at NASA's Johnson Space Center in Houston, Texas for a mission to fly to the Space Station.
- ⇒ This move comes as part of a collaborative effort between NASA and the Indian Space Research Organisation (ISRO) following a deal to send an Indian astronaut to the International Space Station (ISS) by the end of 2024.

Background:

- ⇒ The training at NASA's premier facility marks a historic moment for India's space endeavors, occurring four decades after Wing Commander Rakesh Sharma became the first Indian citizen to travel to space in 1984.

Key Highlights:

- ⇒ The upcoming mission aims to provide practical experience for Indian astronauts and act as a stepping stone towards India's ambitious Gaganyaan mission, which seeks to send astronauts into space and return them safely to Earth.
- ⇒ The collaboration with NASA will leverage the changed landscape of US human spaceflight, which now involves private firms carrying out launches to the ISS.

- ⇒ The Indian astronaut will receive training at NASA's facility before embarking on the journey to the ISS aboard a privately launched spacecraft.

Gaganyaan Mission:

- ⇒ As part of the preparations for the Gaganyaan mission, ISRO plans to conduct two unmanned missions in 2024, using a humanoid robot named 'Vyommitra' to simulate conditions within the crew-carrying capsule.
- ⇒ Additionally, ISRO is set to perform various tests, including Crew Escape System trials and helicopter-drop tests, to ensure the safety and reliability of the mission.

INDIA TO LAUNCH GSAT 20 SATELLITE ON SPACEX FALCON 9 ROCKET TO SPACE



Why in news?

- ⇒ NewSpace India Limited (NSIL), the commercial arm of the Indian Space Research Organisation (ISRO), announced that it will use SpaceX's Falcon 9 rocket for a mission launch later in 2024.
- ⇒ The mission, GSAT-20 satellite launch, will be NSIL/ISRO's first with the Falcon 9 heavy lift launcher, and is slated for the second quarter of 2024.

Key Highlights:

- ⇒ NSIL's second 'demand-driven' satellite mission, GSAT-20 (now renamed as GSAT-N2) is the ISRO arm's second such mission, the first being June 2022's GSAT-24.
- ⇒ GSAT-20 seeks to provide cost-effective 'Ka-Ka band' HTS (High Throughput Satellite) capacity, primarily for broadband and cellular backhaul service demands.
- ⇒ It will cover the entire country, going as far as both Andaman and Nicobar Islands, and Lakshadweep.
- ⇒ Weighing in at 4700 kg, the GSAT-20 is being developed through the expertise of the ISRO and will be launched aboard a Falcon-9 rocket as part of a launch service contract between NSIL and SpaceX.

About SpaceX Falcon 9:

- ⇒ Falcon 9, the world's first 'orbital class reusable rocket,' is a two-stage launch vehicle designed for 'reliable and safe transport of people and payloads into Earth orbit and beyond.'

- Till now, it has undertaken 285 launches, 243 landings, and 217 re-flights.

Way Forward:

- This collaboration highlights the increasing global partnerships in the space industry and underscores the importance of international cooperation in advancing space technology.
- The GSAT-20 mission is particularly significant as it aims to meet the challenging service requirements of remote and previously unconnected regions, bridging the digital divide and fostering inclusive growth.

PM INAUGURATES KOCHI-LAKSHADWEEP ISLANDS SUBMARINE OPTICAL FIBRE CONNECTION



Why in news?

- Prime Minister in Kavaratti, Lakshadweep, inaugurated Kochi-Lakshadweep islands submarine optical fiber connection (KLI-SOFC) project among various developmental projects worth more than Rs. 1,150 crore covering a wide range of sectors including technology, energy, water resources, healthcare and education.

Details:

- The KLI-SOFC project will lead to an increase in internet speed unlocking new possibilities & opportunities. For the first time since independence, Lakshadweep will be connected through Submarine Optic Fibre Cable.
- The dedicated submarine OFC will ensure a paradigm shift in communication infrastructure in the Lakshadweep islands, enabling faster and more reliable internet services, telemedicine, e-governance, educational initiatives, digital banking, digital currency usage, digital literacy etc.

Background:

- The need for digitally connecting the Lakshadweep Islands through a high capacity submarine cable link with the main land has been felt for some time. Earlier, the only means of communication with the Islands was through Satellite medium, which had limited bandwidth capacity and was not able to meet the growing bandwidth demand.
- In the Kochi-Lakshadweep Islands Submarine Cable (KLI) project submarine cable connectivity from Mainland (Kochi) to eleven Lakshadweep Islands namely, Kavaratti, Agatti, Amini, Kadmat, Chetlet, Kalpeni, Minicoy, Androth, Kiltan, Bangaram and Bitra has been extended.
- The project is funded by Universal Services Obligation Fund (USOF), Department of Telecommunication.
- Bharat Sanchar Nigam Limited (BSNL) was the Project Executing Agency and the work was awarded to M/s NEC Corporation India Pvt Ltd through Global Open Tendering process.
- Major activities related to the project includes Marine Route Survey, Submarine Cable laying, Civil Construction of CLS stations, Installation, Testing and Commissioning of End Terminals (SLTE).

Highlights of the KLI Project:

- Total link distance: 1,868 kilometres.
- Total cost of project: Rs 1072 crore plus taxes.

Benefit of the KLI Project:

- The project will play a significant role in achieving the objective of 'Digital India' and 'National Broadband Mission' and for rolling out of various e-governance projects of Government of India in Lakshadweep Islands.
- E-Governance, Tourism, Education, Health, Commerce and Industries will get a boost. It will also help in further improvement in standards of living of the people in Island and will accelerate overall social and economic development in these areas.
- Population of Lakshadweep Islands will be provided high speed wireline broadband connectivity.
- High speed broadband will be provided through FTTH and 5G/4G Mobile network.
- The bandwidth created under this project will be available to all Telecom Service Providers (TSPs) to strengthen their telecom services in the Lakshadweep Islands.

INDIA APPROVES RS 4,797 CRORE PRITHVI SCHEME FOR EARTH SCIENCE RESEARCH

Why in news?

- The Union Cabinet has sanctioned the "Prithvi Vigyan (Prithvi)" scheme, a comprehensive initiative of the Ministry of Earth Sciences.
- With an investment of Rs 4,797 crore earmarked for the period from 2021 to 2026, this scheme is set

to revolutionise India's approach to earth science research and application.



The Prithvi scheme integrates five existing sub-schemes:

- a) Atmosphere & Climate Research-Modelling Observing Systems & Services (ACROSS),
 - b) Ocean Services, Modelling Application, Resources and Technology (O-SMART),
 - c) Polar Science and Cryosphere Research (PACER),
 - d) Seismology and Geosciences (SAGE), and
 - e) Research, Education, Training and Outreach (REACHOUT).
- These programs collectively aim to enhance understanding of the Earth's vital signs and translate scientific knowledge into practical services that benefit society, the environment, and the economy.

What will Prithvi Scheme do?

- One of the primary objectives of Prithvi is to augment and sustain long-term observations across the atmosphere, ocean, geosphere, cryosphere, and solid earth. This will enable recording and monitoring of the Earth System's vital signs and changes.
- Additionally, the scheme focuses on developing predictive models for weather, ocean, and climate hazards, as well as advancing the understanding of climate change science.
- Exploration of the polar regions and high seas is another key aspect, aiming at discovering new phenomena and resources. The scheme also emphasizes the development of technology for the exploration and sustainable harnessing of oceanic resources for societal applications.

Implementation:

- The Ministry of Earth Sciences (MoES) is responsible for providing critical services related to weather, climate, ocean and coastal states, hydrology, seismology, and natural hazards.

Significance:

- These services are crucial for issuing forecasts, warnings, and alerts for various natural disasters such as tropical cyclones, floods, tsunamis, and earthquakes, thereby aiding in disaster preparedness and risk mitigation.

- Earth System Sciences encompass the study of the atmosphere, hydrosphere, geosphere, cryosphere, and biosphere, along with their complex interactions.
- The Prithvi scheme aims to address these components holistically, improving our understanding of Earth System Sciences and providing reliable services for the country.

Way Forward:

- The integrated research and development efforts across different MoES institutes will tackle grand challenges in weather, climate, oceanography, cryospheric studies, and seismology, exploring sustainable ways to harness both living and non-living resources.

DHRUVA SPACE DECLARES SATELLITE PLATFORM LAUNCHED WITH PSLV C58 WORKS



Why in news?

- Hyderabad-based spacetechnology startup Dhruva Space has declared space-qualification of its P-30 satellite platform successful.
- The platform was launched as part of the 'Launching Expeditions for Aspiring Payloads - Technology Demonstrator' (LEAP-TD) mission onboard the Indian Space Research Organisation's (ISRO) Polar Satellite Launch Vehicle (PSLV-C58) POEM-3 mission on January 1 from the First Launch Pad at Satish Dhawan Space Centre (SDSC) in Sriharikota.

Details:

- The LEAP-TD mission utilised a derivative of the P-30 satellite platform integrated with ISRO's PSLV Orbital Experimental Module 3 (POEM-3), facilitating in-orbit scientific experiments using the spent PS4 stage as an orbital platform.
- The POEM system is equipped with standard interfaces and packages for power generation, telemetry, tele-command, stabilization, orbit keeping, and orbit maneuvering, making it suitable for designing, developing, and validating experimental payloads.

Key Highlights:

- This mission successfully validated the P-30 platform and its various subsystems in orbit, including the

On-Board Computer, Ultra High Frequency (UHF) Telemetry, Tracking & Command (TT&C) Module, Beacon in UHF, Attitude Control System with a Reaction Wheel from Comat, and Power Distribution Board.

- Confirmation of the mission's success came through the reception of telemetry and beacon data at the Ground Station of the Indian Institute of Space Science & Technology (IIST) in Trivandrum, as well as data received directly from the POEM platform.
- Hosted payloads are portions of a satellite, such as sensors, instruments, or communication transponders, owned by entities other than the primary satellite operator. These payloads operate independently but share the satellite's power supply, transponders, and sometimes ground systems.

Way Forward:

- The accomplishment of the LEAP Technology Demonstrator marks Druva Space's readiness to offer hosted payload services to the global market.

INDIAN SPACE RESEARCH ORGANIZATION (ISRO) AND MAURITIUS RESEARCH AND INNOVATION COUNCIL (MRIC)



Why in news?

- The Union Cabinet was apprised of a Memorandum of Understanding signed at Port Louis, Mauritius on November 01, 2023 between Indian Space Research Organization (ISRO) and Mauritius Research and Innovation Council (MRIC).

Impact:

- MoU will help to establish a framework for cooperation between ISRO and MRIC on the development of a joint satellite as well as for cooperation on the use of the MRIC's Ground Station.
- Some of the subsystems for the joint satellite will be taken up through the participation of Indian industries and would benefit the industry.
- Collaboration through this joint development of satellite will help in further ensuring continuous support from the Mauritius Government for the Indian ground station at Mauritius, which is critical for ISRO/India's launch vehicle and satellite missions.

- In addition, the joint satellite building will also help in ensuring MRIC support from their ground station for ISRO's small satellite mission in future. Some of the subsystems for the joint satellite will be taken up through the participation of Indian industries and thus may result in employment generation.

Implementation schedule:

- Signing of this MoU shall enable the joint realisation of small satellite between ISRO and MRIC.
- The satellite realisation is proposed to be completed in 15 months' time frame.

Expenditure involved:

- The estimated cost for realisation of the joint satellite is Rs.20 crore, which will be borne by the Government of India. This MoU does not involve any other exchange of funds between the Parties.

Background:

- The space cooperation between India and Mauritius is dated way back in late 1980s when ISRO established a ground station in Mauritius for tracking and telemetry support for ISRO's launch vehicle and satellite missions, under a country-level agreement signed in 1986 for this purpose.
- The current space cooperation is being governed by the country-level agreement signed in 2009, which superseded the 1986 agreement.
- The MoU was signed on November 1, 2023 at Port Louis, Mauritius during the visit of Minister of State (MEA) to Mauritius for the 'Aapravasi Diwas' event.

ADITYA L1 REACHES DESTINATION, IN ORBIT AROUND L1



Why in news?

- The Indian Space Research Organisation (ISRO) has placed the Aditya-L1 spacecraft in a halo orbit around the Lagrangian point (L1).
- India's maiden solar mission, Aditya-L1, reached the L1 point, 127 days after it was launched on September 2, 2023.

Details:

- After a 1.5-million-km journey, the spacecraft was placed in the orbit following a firing manoeuvre carried out by ISRO scientists and engineers at the

ISRO Telemetry Tracking and Command Network (ISTRAC), Bengaluru.

- The insertion of Aditya-L1 into this halo orbit presents a critical mission phase, which demands precise navigation and control.
- Aditya-L1 carries seven payloads to observe the photosphere, chromosphere, and the outermost layer of the sun (corona) using electromagnetic and particle detectors.

Periodic orbit:

- The orbit of Aditya-L1 spacecraft is a periodic halo orbit which is located roughly 1.5 million km from earth on the continuously moving sun-earth line with an orbital period of about 177.86 earth days.
- This halo orbit is a periodic, three-dimensional orbit at L1 involving sun, earth and a spacecraft.
- This specific halo orbit is selected to ensure a mission lifetime of 5 years, minimising station-keeping manoeuvres and thus fuel consumption and ensuring a continuous, unobstructed view of the sun.

What is Lagrangian Point 1 (L1)?

- The Aditya L1 spacecraft has reached Lagrange Point 1, a unique spot in space outside the orbit of the Moon to give a clear view of the Sun throughout the year.
- Lagrangian Point 1 (L1) is a stable point in space where the gravitational forces of two large bodies, such as the Earth and the Sun, balance the centripetal force felt by a smaller object, like a satellite.
- It lies along the line connecting the two larger bodies and allows satellites to maintain a relatively constant position.
- Objects positioned at L1 remain in a stable configuration relative to the Earth and the Sun, making it an advantageous location for certain types of satellites, like those used for solar observations or monitoring space weather.
- However, maintaining a satellite at L1 requires constant adjustments due to gravitational perturbations from other celestial bodies.

What's next?

- The Aditya L1 now has a five-year-long mission in front of it during which it will observe the sun using a package of seven instruments.
- The spacecraft will study the layers of the Sun, especially the corona which remains an enigma to solar physicists.

NASA PEREGRINE LANDER FACE FAILURE

Why in news?

- The Peregrine lunar lander, launched from the United States, encountered critical propulsion issues moments after it separated from the Vulcan rocket to begin its journey to the Moon.



- The spacecraft, which was to land on the Moon on February 23, has now become a flyby mission with less than 40 hours of life remaining.

Details:

- The Peregrine lander, which represents a new era of lunar exploration involving private sector technology, experienced difficulties achieving the correct orientation for solar power due to the propulsion problem.
- This technical hiccup occurred despite the successful launch aboard United Launch Alliance's Vulcan rocket.

Payloads:

- The mission carries five scientific investigations from NASA, all aimed at advancing understanding of the Moon's surface and preparing for future human and robotic exploration.
- Although the immediate future of these payloads is uncertain due to the current issue, NASA has plans to send copies of four of these instruments on subsequent missions.
- These include the Laser Retroreflector Array, Near-Infrared Volatile Spectrometer System, Neutron Spectrometer System, and Linear Energy Transfer Spectrometer. The fifth instrument, the Peregrine Ion-Trap Mass Spectrometer, does not have a scheduled re-flight at this time.

What's next?

- As the investigation into the propulsion issue continues, both NASA and Astrobotic are working diligently to review flight data to pinpoint the root cause and devise a strategy to move forward.

UAE TO HELP NASA IN DEVELOPING GATEWAY SPACE STATION

Why in news?

- NASA and the Mohammed bin Rashid Space Centre (MBRSC) of the United Arab Emirates (UAE) have unveiled plans to deepen their space exploration partnership.
- The UAE is set to contribute a critical piece of infrastructure, an airlock module, to the Artemis Lunar Gateway, humanity's first lunar-orbiting space station.



Artemis Lunar Gateway:

- The Artemis program, underpinned by the Artemis Accords aims to return humans to the Moon, landing the first woman and the first person of colour on its surface.
- The Artemis Lunar Gateway is designed to be a pivotal outpost for long-term lunar exploration and research, providing a habitat for astronauts and serving as a staging point for missions to the Moon's surface.
- This collaboration marks a significant step in international space cooperation, with the UAE joining forces with other key partners such as the Canadian Space Agency (CSA), European Space Agency (ESA), and Japan Aerospace Exploration Agency (JAXA).

Key Highlights:

- Under the new agreement, MBRSC will supply the Crew and Science Airlock module for the Gateway, which will facilitate the transfer of crew and scientific research between the station's pressurized environment and the vacuum of space.
- This capability is essential for conducting groundbreaking science in deep space and preparing for potential future missions to Mars.
- The UAE's involvement extends beyond hardware provision; it includes sending a UAE astronaut to the Gateway on a future Artemis mission and offering engineering support throughout the station's operational life.

What it holds for UAE?

- This collaboration builds upon the UAE's growing contributions to space exploration, including sending the first Emirati astronaut, Hazzaa Almansoori, to the International Space Station in 2019, followed by Sultan Al Neyadi in 2023.
- Additionally, two more Emirati astronaut candidates are currently training at Nasa's Johnson Space Center

INDIAN ARMY INDIGENOUSLY DEVELOPS SECURE MOBILE ECOSYSTEM SAMBHAV

Why in news?

- Recently, the Indian Army has indigenously developed an 'end-to-end secure mobile ecosystem' to provide secure communication with instant connectivity on the move.



- The ecosystem, SAMBHAV (Secure Army Mobile Bharat Version) operates on the state-of-the-art contemporary 5G technology and will represent a "significant leap forward in India's defence capability".
- It has been developed in close collaboration with national centres of excellence from the academia and industry.

Details:

- SAMBHAV will have multi-layered encryption with a pan-India secure ecosystem. It will ride on a commercial network with inherent security.
- This leverages the potential of indigenous public cellular networks in the country and the ecosystem has '5G -ready handsets using multi-tier encryption'.
- This aligns with the government of India's efforts towards 'dual-use infrastructure' and it also manifests 'civil-military fusion' in the field of emerging technology.

CCOSWs:

- Command Cyber Operations Support Wings (CCOSWs) are being established, which are "special sub-units" to augment cyber capability. Cyber capability is being enhanced and integrated at all levels with defence cyber agencies at strategic level, while CCOSWs will be functional at "operational and tactical levels.
- Six CCOSWs are being established for all commands. The personnel will be given specialist training and undergo validation exercises.

DRDO SUCCESSFULLY CONDUCTS FLIGHT TEST OF NEW-GENERATION AKASH MISSILE



Why in news?

- India recently conducted a successful flight test of the new generation AKASH missile from the Integrated Test Range (ITR), Chandipur off the coast of Odisha.
- The flight test was conducted by DRDO against a high-speed unmanned aerial target at very low altitude.

Performance:

- During the flight test, the target was successfully intercepted by the weapon system and destroyed.
- It has validated the functioning of the complete weapon system consisting of the missile with indigenously developed Radio Frequency Seeker, Launcher, Multi-Function Radar and Command, Control & Communication system.
- The system performance was also validated through the data captured by a number of Radars, Telemetry and Electro Optical Tracking System deployed by ITR, Chandipur.

Way Forward:

- The AKASH-NG system is a state-of-the-art missile system capable of intercepting high speed, agile aerial threats.
- The successful flight test has paved the way for User trials.

AIRCRAFT DESIGNED BY NASA CAN QUIETLY FLY FASTER THAN SPEED OF SOUND



Why in news?

- NASA and Lockheed Martin have unveiled the X-59 quiet supersonic aircraft, a groundbreaking experimental plane designed to transform air travel by breaking the sound barrier with a mere sonic "thump" rather than a disruptive boom.
- The debut took place at Lockheed Martin's Skunk Works facility in Palmdale, California, marking a significant leap from concept to reality.

X-59:

- The X-59 is the cornerstone of NASA's Quesst mission, which aims to provide crucial data that could lead to the lifting of current prohibitions on commercial supersonic flight over land.
- For decades, such flights have been banned due to

the loud sonic booms they produce, which can cause considerable disturbance on the ground.

- However, the X-59 promises to fly at speeds of 1.4 times the speed of sound, or 925 mph, while producing a sound comparable to a car door closing, due to its innovative design and technology.

Salient features:

- The X-59 stretches 99.7 feet in length and 29.5 feet in width, with a slender, tapered nose that disrupts shock waves, mitigating the traditional sonic boom.
- The cockpit, uniquely positioned amidships, lacks a forward-facing window and instead employs an eXternal Vision System, which relays high-resolution imagery to a 4K monitor, providing pilots with a clear view ahead.

What's next?

- With the aircraft's rollout complete, the next phase involves integrated systems testing, engine runs, and taxi testing. The first flight is scheduled for later 2024, with subsequent quiet supersonic flights to follow.
- The initial tests will be conducted at Skunk Works before the X-59 moves to NASA's Armstrong Flight Research Center in Edwards, California, for further operations.
- Post-flight tests, NASA intends to fly the X-59 over selected US cities to gather public perception data on the quieter sonic signature.

INDIA FIRST GRAPHENE CENTRE, IOT COE IN KERALA



Why in news?

- MeitY recently launched a Centre of Excellence (CoE) in Intelligent Internet of Things (IIoT) Sensors and India's first graphene centre - India Innovation Centre for Graphene (IICG) in Kerala.

Details:

- The CoE in IIoT Sensors is a unique facility established at Makers Village Kochi by MeitY, Government of India and Government of Kerala to catalyse the development of sensors within the realm of Intelligent IoT systems covering a broad spectrum of applications of intelligent sensors in networks, devices and sensor systems.

- Further, the India Innovation Centre for Graphene (IICG) has also been established at Makers Village Kochi by MeitY and Government of Kerala along with Tata Steel Limited.
- Digital University Kerala (DUK) (formerly IITMK) and Centre for Materials for Electronics Technology (CMET), Thrissur are the technical partners for setting up these centres.
- The complete full-fledged facility for R&D, incubation, innovation, skilling, capacity building, testing and certification shall be established at these centres by the experts of these agencies.

Hardtech 2024:

- It also unveiled Hardtech 2024 - Makers Village's premier annual program on the occasion.
- This program aims to unite key figures from industries, startups, investors, academia, and R&D organisations involved in electronics hardware design and manufacturing.

Way Forward:

- The creation of a complete ecosystem for startups in the area of IoT sensors and graphene & 2D materials is the main objective for setting up these centres in the country.

HOW IIST AND DHRUVA SPACE PROPELLED PSLV C58 XPOSAT MISSION TO SPACE



Why in news?

- The Indian Institute of Space Science and Technology (IIST) has played a crucial role in the successful launch of the PSLV-C58 XPoSat mission on January 1.
- The mission saw the deployment of the LEAP-TD payload developed by Hyderabad-based space startup Dhruva Space.

LEAP-TD payload:

- The LEAP-TD payload was part of the nine payloads carried by the POEM orbiting platform of PSLV C58.
- It was designed for technology demonstration, including telemetry and telecommand modules, among other subsystems. This marks a significant milestone for Dhruva Space, showcasing their capabilities in small satellite systems development.

SSPACE:

- The success of satellite missions heavily relies on ground communication for telemetry and telecommand. IIST's Small-spacecraft Systems and Payload Centre (SSPACE) and its ground station tracking systems have been instrumental in this regard.
- They have supported multiple satellites, including the recent PSLV C58 mission, ensuring continuous operations for telemetry and telecommand.

Collaboration:

- LEAP-TD, now in a ~350 km low earth orbit, is visible over IIST for approximately 10 minutes during its high elevation orbits each day. During these critical windows, the ground station must accurately track the satellite to receive telemetry and send telecommands.
- A team from Dhruva Space joined forces with IIST to enhance the ground station's capabilities to meet the specific needs of the LEAP-TD payload.

Way Forward:

- This collaboration positions IIST as a provider of reliable ground station tracking systems and services for small satellites. It opens doors for universities and startups to leverage these facilities, fostering innovation and rapid deployment of space assets.

HUBBLE TELESCOPE DISCOVERS ALIEN PLANET WITH WATER OUTSIDE SOLAR SYSTEM



Why in news?

- The National Aeronautics and Space Administration (NASA) astronomers, using the Hubble Space Telescope, have identified the smallest exoplanet with detectable water vapour in its atmosphere.
- GJ 9827d, approximately twice the diameter of Earth, stands out as a potential example of planets with water-rich atmospheres in our galaxy.

GJ 9827d:

- The newly-found exoplanet demonstrates Venus-like temperatures, reaching 752 degrees Fahrenheit (400 degrees Celsius).
- Despite its scorching conditions, the finding is significant due to the unique properties of this distant world.

➤ GJ 9827d, boasting a size around twice that of Earth, orbits the star GJ 987, positioned approximately 97 light-years away in the constellation of Pisces.

Why it matters?

- The Hubble Telescope diligently observed GJ 9827d over a span of three years capturing 11 transits as the exoplanet crossed its star's face.
- This meticulous observation is crucial as the chemical composition of a planet's atmosphere can be unveiled by analysing the light it absorbs during a transit.

What's next?

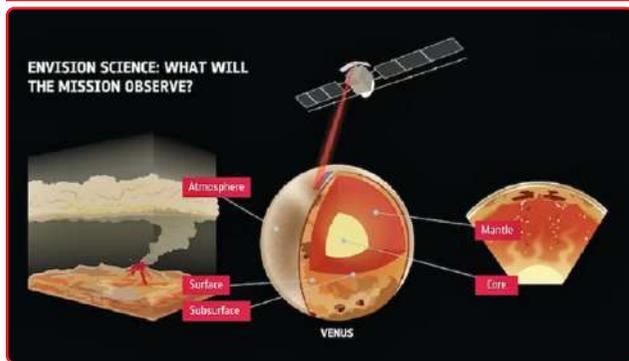
- However, NASA said that the specifics of Hubble's findings regarding GJ 9827d's atmosphere are currently uncertain.
- The astronomers leading this discovery will now study whether the telescope detected a modest amount of water within a hydrogen-rich, expansive atmosphere or if the exoplanet's atmospheric composition is predominantly water

- The mission's trio of spectrometers will analyse the composition of Venus's surface and atmosphere, offering insights into volcanic gases and potential signs of active volcanism. These observations will also contribute to understanding how surface events influence atmospheric conditions.
- A radio science experiment will complement these instruments by probing Venus's internal structure, including the size and composition of its core and mantle, as well as examining atmospheric properties.

Future Prospects:

- By investigating the interplay between Venus's surface, interior, and atmosphere, EnVision will help scientists piece together the planet's geological and climatic evolution.
- The mission's findings could also inform our knowledge of Earth-like exoplanets, enhancing our grasp of habitable zones and planetary development across the cosmos.

EUROPE TO LAUNCH ENVISION MISSION IN 2031 TO STUDY VENUS AND ITS INNER CORE



Why in news?

➤ The European Space Agency (ESA) has officially approved the EnVision mission, which promises to provide unprecedented insights into Venus, our closest planetary neighbour.

Aim:

- Slated for a 2031 launch aboard an Ariane 6 rocket, EnVision will embark on a comprehensive study of Venus, from its fiery inner core to the dynamic outer atmosphere.
- This ambitious mission aims to shed light on the planet's complex history, geological phenomena, and extreme climate conditions.

Key Highlights:

- EnVision's suite of sophisticated instruments will dissect Venus's secrets. The mission will be the first to directly measure the planet's subsurface features with a radar sounder, providing clues about its geological activity.
- VenSAR, another advanced radar tool, will deliver detailed surface maps, revealing the planet's topography with up to 10-meter precision.

HEALTH

SMART 2.0 LAUNCHED FOR AYURVEDA TEACHING PROFESSIONALS



Why in news?

- The Central Council for Research in Ayurvedic Sciences (CCRAS) along with National Commission for Indian System of Medicine (NCISM) has launched 'SMART 2.0' (Scope for Mainstreaming Ayurveda Research among Teaching professionals) program.
- Its purpose is to promote robust clinical studies in priority areas of Ayurveda with Ayurveda academic institutions/hospitals across the country through mutual collaboration.

Key Highlights:

- The study aims at safety, tolerability and adherence to Ayurveda formulations in the priority research areas of Bal Kasa, Malnutrition, Insufficient lactation, Abnormal Uterine Bleeding, Osteoporosis in post-menopausal women and Diabetes Mellitus (DM) II.
- The objective of 'SMART 2.0' is to generate a tangible evidence to demonstrate efficacy and safety of Ayurveda interventions using interdisciplinary

research methods and translating it into public health care.

- Under the 'SMART 1.0', around 10 diseases were covered with the active participation of teaching professionals from 38 colleges.

About CCRAS:

- CCRAS is an apex organization for the formulation, co-ordination, development and promotion of research on scientific lines in Ayurveda, functioning under the Ministry of Ayush.

INDIAN SCIENTISTS DEVELOP RS2, A HEAT TOLERANT ADAPTIVE COVID 19 VACCINE



Why in news?

- Scientists at the Indian Institute of Science (IISc) have designed a promising vaccine candidate that could revolutionise the fight against Covid-19.
- The team has engineered a heat-tolerant vaccine that is not only effective against all current strains of SARS-CoV-2 but can also be swiftly adapted to combat future variants.

RS2:

- The innovative vaccine candidate, known as RS2, is a synthetic antigen that combines two critical components of the virus's spike protein: the S2 subunit and the Receptor Binding Domain (RBD).
- The S2 subunit is less prone to mutations compared to the S1 subunit targeted by most existing vaccines, making it a more stable candidate for long-term immunity. The RBD is recognized for its ability to elicit a robust immune response.
- This hybrid protein was produced using mammalian cell lines.
- This suggests that the RS2 antigen could be manufactured in large quantities, which is essential for mass vaccination efforts.

Features:

- Animal model testing revealed that the RS2 antigen triggered a potent immune response and provided superior protection compared to vaccines containing the entire spike protein.
- Moreover, the RS2 antigen boasts an exceptional feature: it can be stored at room temperature for up to a month without the need for refrigeration.

- This characteristic could significantly reduce the logistical challenges and costs associated with vaccine distribution, particularly in regions with limited access to cold storage facilities.

Way Forward:

- The RS2 vaccine candidate's adaptability to include the RBD region of any emerging SARS-CoV-2 variant, coupled with its cost-effective production and distribution potential, positions it as a vital future tool in the global effort to control and eventually end the Covid-19 pandemic.

WHAT IS DISEASE X?



Why in news?

- The World Economic Forum (WEF) 2024 is being organized in Davos, Switzerland.
- World leaders at the forum are set to discuss Disease X - a mysterious name for an illness caused by a currently unknown, yet serious microbial threat.
- A panel of the World Health Organization (WHO) will join other health officials to discuss the health threat at the WEF.

What is Disease X?

- It is an illness caused by a currently unknown, yet serious microbial threat.
- The WHO added Disease X in 2017 to a list of pathogens deemed a top priority for research alongside Ebola and Severe Acute Respiratory Syndrome (SARS).
- Covid is an example of Disease X. The vast reservoir of viruses circulating in wildlife is seen as a likely source of more such diseases due to their potential to spill over and infect other species, including humans.

The significance of Disease X:

- The reason to study Disease X is to enable cross-cutting R&D (research and development) preparedness that is also relevant for an unknown disease. The global humanitarian crisis sparked by Ebola, Covid, and other diseases has been a wake-up call.
- The Ebola epidemic killed thousands of people globally. Bloomberg reported that despite decades of research, there were no products ready to deploy in time to save these lives.

⇒ In response, the WHO created an R&D Blueprint to accelerate the development of a range of tools for "priority diseases".

Which are the priority pathogens right now?

⇒ The current list of priority diseases by the WHO includes - Covid, Crimean-Congo hemorrhagic fever, Ebola virus disease and Marburg virus disease, Lassa fever, Middle East respiratory syndrome (MERS) and SARS, Nipah and henipaviral diseases, Rift Valley fever, Zika and Disease X.

MOSQUITOFISH, USED TO FIGHT MOSQUITOES, HAS BECOME INVASIVE IN INDIA



Why in news?

⇒ In the last few months, various government and non-governmental organisations in Andhra Pradesh, Odisha, and Punjab have released mosquitofish into local water bodies to address a mosquito menace that locals have complained about.

Burden of mosquito-borne diseases:

⇒ The world's climate and habitats have changed noticeably in the last century, accelerating the spread of mosquito-borne diseases. Today, these diseases prevail in more than 150 countries worldwide, affecting more than 500 million people.

⇒ In India alone, around 40 million individuals contract mosquito-borne diseases every year, and mosquito-borne illnesses have remained a persistent public health concern for many decades.

What is mosquitofish?

⇒ In the 1960s, approaches including introducing mosquitofish in freshwater ecosystems to feed on mosquito larvae became prominent as alternatives to chemical solutions like pesticides, which were found to have dire adverse effects on both human health and the ecosystem. The uptake of these alternatives increased in the 1980s and 1990s.

⇒ Many of them were considered to be environmentally friendly and sustainable. Among mosquito predators were two species of mosquitofish, *Gambusia affinis* and *Gambusia holbrooki*.

⇒ These species of mosquitofish originated in the U.S. but today have become global inhabitants.

⇒ They are notorious for their detrimental ecological impact, including displacing and preying on native fauna, leading to the extinction of native fish, amphibians, and various freshwater communities.

⇒ As such, *Gambusia* stands out as some of the most widely dispersed freshwater fish, aided by their robust adaptability and high tolerance for fluctuating environmental conditions.

Is mosquitofish 'used' in India?

⇒ The Indian Council of Medical Research (ICMR), India's nodal medical research organisation, plays a significant role in mosquito management in the country particularly in the context of controlling mosquito-borne diseases and conducting research to develop effective strategies.

⇒ In 1928, *Gambusia* was first introduced in India during British rule. Later, various governmental organisations, such as the ICMR, the National Institute of Malaria Research (NIMR), local municipal corporations, the Fisheries Department, and the Health Department, alongside other private organisations in India, took over as part of their efforts to combat malaria.

⇒ The idea of this scheme was that the newly introduced species would prey on or compete with mosquito larvae, reducing the latter's population.

⇒ The government also entrusted several municipal corporations, district administrations (and their health departments), fisheries departments, tribal development agencies, local aquaculturists, and the general public with introducing these fish across India.

⇒ Today, as in the American story, *Gambusia*, has become widespread in India as well, establishing self-sustaining populations in various habitats around the country.

What effects has mosquitofish had?

⇒ The researchers recently investigated the diversity of haplotypes and genotypes within *Gambusia* species in India. (Haplotypes are DNA variants likely to be inherited together; the genotype is an organism's entire genetic material.) They revealed the widespread distribution of *G. holbrooki* and, to a lesser extent, *G. affinis*, the latter especially so in Northeast India.

⇒ Wildlife biologists and conservationists consider mosquitofish to be among the hundred most detrimental invasive alien species.

⇒ Aside from their resilience, these fish also have voracious feeding habits and have demonstrated aggressive behaviour in habitats to which they are introduced.

Impacts in other countries:

⇒ In Australia, introduced mosquitofish have led to the local extinction of the red-finned blue-eye (*Scaturiginichthys vermeilipinnis*), an endemic fish

species. They have also been observed preying on the eggs and larvae of native fish and frogs.

- A study from New Zealand highlighted the threat posed by *Gambusia* to their native aquatic biodiversity. In India, some reports have indicated a decline in *Microhyala* tadpoles following the introduction of *Gambusia*.
- For these reasons, the World Health Organisation stopped recommending *Gambusia* as a mosquito control agent in 1982.
- In 2018, the National Biodiversity Authority of the Government of India also designated *G. affinis* and *G. holbrooki* as invasive alien species.

How can mosquitofish be controlled?

- The first has to do with the National Centre for Vector Borne Diseases Control (NCVBDC) of the Ministry of Health & Family Welfare displaying a recommendation on its website for the use of *Gambusia* and *Poecilia* (guppy) fishes to manage mosquitoes. This recommendation must be removed.
- Second, for effective mosquito control, alternatives to *Gambusia* should come from local solutions.
- Experts have suggested a collaboration between mosquito biologists/entomologists, invasion ecologists, and fish taxonomists, with a focus on river basins. Together, they can compile lists of native fish species in each basin that are capable of controlling mosquito larvae.
- Then, based on these lists, authorities can release the relevant species into the natural environment, sidestepping the risk of ecological repercussions posed by invasive alien species.

CULTURE

10TH CENTURY KADAMBA INSCRIPTION WRITTEN IN KANNADA AND SANSKRIT FOUND IN GOA



Why in news?

- An inscription written in Kannada and Sanskrit and said to be of 10th century A.D. Kadamba period has been discovered in the Mahadeva temple at Cacoda in southern Goa.

Details:

- Its epigraph is engraved in Kannada and Nagari characters.
- The inscription opens with an auspicious saying 'be it well' (Swasthi Shri), and records that when Talara Nevayya was administering the mandala, his son Gundayya having taken a vow to fulfil his father's desire of capturing a gopura of the port of Goa, fought and died after fulfilling his father's wish. Very interestingly, the record is composed as a vocal statement on the death of his son from the mouth of a lamenting father. It is in the literary style of Talangre inscription of Jayasimha I of the same period..."

About Kadambas of Goa:

- The Kadambas of Goa were the subordinates of Chalukyas of Kalyana. Chalukyan emperor Tailapa II appointed Kadamba Shasthadeva as mahamandaleshwara of Goa for his help in overthrowing the Rashtrakutas.
- Kadamba Shasthadeva conquered the city of Chandavara from the Shilaharas in 960 A.D. Later, he conquered the port of Gopakapattana (present Goa).
- Gundayya, the son of Talara Nevayya, may have participated in this battle, and won the port at the cost of his life.
- His father may have erected a memorial stone with the inscription in the temple of Mahadev of Cacoda to commemorate the heroic fight of his son.

DIGITAL TOOLS SET TO SAVE KASHMIRI SCRIPT



Why in news?

- For centuries, the Kashmiri language has survived only through oral traditions; by 2013, those who could write the script fell to just 5%.
- In 2024, two tech giants, Microsoft and Google, will infuse a new lease of life into the language, whose rich literature continues to remain accessible only to a small section of people.

Kashmiri in Google Translate:

- In November 2023, an online campaign was on to get Kashmiri included in Google Translate as well; this demand has also been accepted and is likely to be rolled out in the next six months.

- ⇒ The initiatives are likely to benefit 70 lakh Kashmiri speakers living in the erstwhile State of Jammu and Kashmir, including those in Pakistan-occupied Kashmir.
- ⇒ In the 1970s, it was Radio Kashmir and the J&K Cultural Academy that played a key role in enhancing the prospects of the Kashmiri language, giving it a fillip.
- ⇒ Besides, singers like Ghulam Ahmad Sofi and Abdul Rashid Hafiz ensured that the language survives through folk music.

Campaign by AMK:

- ⇒ The Adbee Markaz Kamraz (AMK) an umbrella platform of 30 cultural organisations in the valley, is at the forefront of efforts to promote Kashmiri.
- ⇒ It was the AMK campaign that pushed around 17,000 people to write to Google in November and December last year, urging the company to include Kashmiri in its translation app.

Official language:

- ⇒ Urdu was introduced as an official language during the Dogra monarchy in Kashmir prior to Independence. Kashmiri was introduced as a subject up to the primary level after 1947, only to be withdrawn in 1955 for unknown reasons.
- ⇒ An earlier AMK campaign, however, resulted in the re-inclusion of Kashmiri as a subject in schools up to Class 8 by 2001. Later, Kashmiri was introduced as an optional subject at the undergraduate level in 2008.
- ⇒ In 2020, the Union government passed the Jammu and Kashmir Official Languages Bill, including Kashmiri in the list of official languages of the Union Territory (UT).

UNDER NEW DEAL, EACH STATE CAN FIELD TABLEAU ONCE IN THREE YEARS



Why in news?

- ⇒ With repeated controversies erupting over rejection of tableaux for the Republic Day parade year after year, the Defence Ministry has proposed a plan for the States and Union Territories to showcase their display by rotation.
- ⇒ Approximately 15 tableaux from the States and Union Territories are selected for the parade every year.

Details:

- ⇒ Discussions were held three or four times with the Resident Commissioners of various States and Union Territories at a meeting chaired by the Defence Secretary.
- ⇒ To fast-track the participation of tableaux year-wise, willingness of States and UTs was sought in advance for the next three years for their participation in Republic Day Parades 2024, 2025 and 2026. In response, most of the States/UTs conveyed their willingness for all the three years.

Tableaux for 2024 parade:

- ⇒ To encourage new and fresh talent, the Culture Ministry empanelled 30 agencies for design and fabrication of tableaux through an open selection process. The States and Union Territories were advised to engage these agencies following an appropriate procedure.
- ⇒ After four rounds of meetings, 16 States and Union Territories; Andhra Pradesh, Arunachal Pradesh, Chhattisgarh, Gujarat, Haryana, Jharkhand, Ladakh, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Odisha, Rajasthan, Tamil Nadu, Telangana and Uttar Pradesh – were selected for the 2024 parade.
- ⇒ The States that could not get an opportunity were invited to showcase their tableaux at the Bharat Parv at the Red Fort from January 23 to 31.
- ⇒ The list shows that the tableaux of non-BJP-ruled States of Jharkhand, Odisha, Andhra Pradesh, Tamil Nadu, Telangana and Meghalaya have been selected by the Expert Committee for RDP-2024. On the other hand, States such as Uttarakhand and Goa have not been selected.

Background:

- ⇒ Earlier Punjab Chief Minister Bhagwant Mann hit out at the Union government over the non-inclusion of the State's tableau this year alleging discrimination against the State. The Centre denied the allegation.
- ⇒ The Karnataka Chief Minister Siddaramaiah alleged that despite sending seven proposals for 2024 parade, the Centre rejected all of them.
- ⇒ Karnataka has displayed its tableau in the Republic day parade every year from 2015 to 2023.



PRACTICE QUESTION FOR UPSC PRELIMS EXAM

1. Consider the following statements with respect to Financial Intelligence Unit India (FIU IND)
 1. It is a national agency responsible for receiving and disseminating information relating to suspect financial transactions.
 2. It is an independent body that reports directly to the Economic Intelligence Council (EIC) headed by the Prime Minister.
 3. FINnet 2.0 Mission is an initiative of FIU IND to provide quality financial intelligence.
 How many of the statements given above are incorrect?
 - a) Only one
 - b) Only two
 - c) All Three
 - d) None of the above

2. Consider the following statements with respect to Maharishi Valmiki
 1. He is the original author of the story of Lord Ram and the first poet of Sanskrit language.
 2. Maharishi Valmiki International Airport is located in the state of Uttar Pradesh.
 3. Valmiki Jayanti is celebrated annually in the month of January.
 How many of the statements given above are correct?
 - a) Only one
 - b) Only two
 - c) All Three
 - d) None of the above

3. Consider the following statements with respect to Psychoanalysis:
 1. It is a method of treating mental disorders, shaped by psychoanalytic theory, which emphasizes unconscious mental processes.
 2. It was coined by Sigmund Freud.
 3. It was the first modern Western system of psychotherapy.
 How many of the statements given above are correct?
 - a) Only one
 - b) Only two
 - c) All three
 - d) None of the above

4. In the UN's Genocide Convention, the term 'Genocide' includes which of the following?
 1. Killing members of a group.
 2. Causing serious bodily or mental harm to members of a group.
 3. Deliberately inflicting on the group conditions of life, calculated to bring about its physical destruction in whole or any part of it.
 4. Imposing measures intended to prevent births within the group.
 5. Forcibly transferring children of the group to another group.
 Choose the correct codes:
 - a) 1, 2, 3 and 4
 - b) 1, 2, 4 and 5
 - c) 1, 3, 4 and 5
 - d) 1, 2, 3, 4 and 5

5. Project Kusha, sometimes seen in the news is related to which of the following?
 - a) India's indigenous air defence system.
 - b) A Statue of Kusha, twin son of Lord Rama and Sita to be built at Ayodha temple.
 - c) Inland Water-Ways Development Project at kushi nagar in Uttar Pradesh.
 - d) Mega project that focuses on improving the overall logistics in the country.

6. Consider the following statements with respect to Square Kilometre Array Observatory (SKAO)
 1. It is a single telescope installed in radio-quiet region of Argentina.
 2. SKAO will observe and map galaxies at the edge of the observable universe.
 3. India is not a part of this world's largest radio telescope project.
 How many of the statements given above are correct?
 - a) Only one
 - b) Only two
 - c) All Three
 - d) None of the above

7. Consider the following statements with respect to Global Snow Leopard and Ecosystem Protection Programme (GSLEP):
 1. It is an alliance between 12 snow leopard range countries, organizations and communities to protect the snow leopard and its mountain ecosystems.
 2. It aims to achieve the goals of the Bletchley Declaration.
 3. India is one among the 12 snow leopard range countries and a member of GSLEP.
 How many of the statements given above are correct?
 - a) Only one
 - b) Only two
 - c) All Three
 - d) None of the above

38. Consider the following statements with respect to Dark Fibre:
1. It is an unused optical fibre without active electronics, carrying no data flow.
 2. It is a single mode optical fibre that runs from end to end with no active equipment in-between.
 3. A Dark Fibre network provides reliable and secure optical infrastructure.
- How many of the above statement(s) is/are incorrect?
- a) Only one
 - b) Only two
 - c) All three
 - d) None of the above
39. Consider the following statements with respect to Lakshadweep:
1. It is India's smallest Union Territory with just one district.
 2. Lakshadweep has a tropical climate.
 3. There are no Scheduled Caste communities in Lakshadweep.
- How many of the above statement(s) is/are correct?
- a) Only one
 - b) Only two
 - c) All three
 - d) None of the above
40. Consider the following statements regarding the remission laws in India.
1. Articles 72 and 161 of the Constitution provides power to Governors and President respectively to remit a sentence passed by the Courts.
 2. Prisons is a Concurrent subject under the 7th Schedule and hence State governments have power to remit sentences.
- Which of the above statement(s) is/are correct?
- a) 1 only
 - b) 2 only
 - c) Both 1 and 2
 - d) Neither 1 nor 2
41. Consider the following statements with respect to the International Classification of Diseases (ICD):
1. It is an initiative of the World Health Organization (WHO).
 2. The National Centre for Disease Control (NCDC) serves as the WHO Collaboration Centre for ICD-related activities in India.
- Which of the statements given above is/are correct?
- a) 1 only
 - b) 2 only
 - c) Both 1 and 2
 - d) Neither 1 nor 2
42. Consider the following statements with respect to Sisal Plants:
1. It has the ability to store water and thrive in drought-prone areas.
 2. It is native to India and are used in making ropes, paper and cloth.
 3. The ancient Aztec and Mayan civilisations were the first to begin making paper out of sisal leaves.
- How many of the statements given above are correct?
- a) Only one
 - b) Only two
 - c) All Three
 - d) None of the above
43. NUTEC Plastics, sometimes seen in the news, is an initiative of which of the following organisations?
- a) International Atomic Energy Agency (IAEA)
 - b) United Nations Environment Programme (UNEP)
 - c) International Union for Conservation of Nature (IUCN)
 - d) World Wide Fund for Nature (WWF)
44. Consider the following statements with respect to Active rock glaciers (ARGs)
1. ARGs are permafrost landforms in alpine regions that contain significant amounts of ice and move downslope or down valley.
 2. They are not found in the young fold mountains.
 3. It can contribute to natural disasters as the region warms.
- How many of the statements given above are incorrect?
- a) Only one
 - b) Only two
 - c) All Three
 - d) None of the above
45. Consider the following statements with respect to Chemical, Biological, Radiological and Nuclear (CBRN) Warfare/Disasters
1. The CBRN defence teams of the National Disaster Response Force (NDRF) is the first respondent of any disaster related to CBRN in India.
 2. TARKASH is an exercise between USA and India to address the terror threat related to CBRN.
- Which of the statement(s) given above is/are correct?
- a) 1 only
 - b) 2 only
 - c) Both 1 and 2
 - d) Neither 1 nor 2
46. Operation Pahaar and Operation Shakthi, sometimes seen in the news recently, was conducted by which of the following organisation(s)?
- a) Central Bureau of Narcotics
 - b) Indian Coast Guard
 - c) Financial Intelligence Unit
 - d) Central Bureau of Investigation
47. Consider the following pairs of the terms in news and their relevance:
- | Terms in news | Relevance |
|-------------------------|---|
| 1. Ugram | Scheme for building pucca house |
| 2. Drishti 10 Starliner | India's first cruise in the Western Coast |
| 3. VINBAX | Military exercise between India-Vietnam |
- How many of the above pair(s) is/are matched incorrectly?
- a) Only one
 - b) Only two
 - c) All three
 - d) None of the above
48. Which of the following countries are part of the Sahel Region?
1. Algeria
 2. Libya
 3. Algeria
 4. Mauritania

- Choose the correct code.
- a) 1 and 2 only b) 2 and 3 only
c) 1, 3 and 4 only d) 1, 2, 3 and 4
49. Consider the following statements with respect to Grant for Research and Entrepreneurship across Aspiring Innovators in Technical Textiles (GREAT)
1. It provides grant up to 50 lakhs for start-ups in technical textiles field.
 2. It is an initiative of the Ministry of Enterprise and Innovation.
 3. It is part of the Multiplier Grants Scheme (MGS).
- How many of the statements given above are correct?
- a) Only one b) Only two
c) All Three d) None of the above
50. Panspermia, sometimes seen in the news is related to which of the following?
- a) A natural pathogenic fungi to help save eucalyptus forests from devastating pest.
 - b) A Greece hypothesis that attributes the origin of life on one planet to a different planet.
 - c) A type of sustainable fuel that is produced from the whiskey.
 - d) A new class of antibiotics that can kill drug-resistant bacteria.
51. Consider the following statements regarding Pradhan Mantri Anusuchit Jaati Abhuyday Yojana (PM- AJAY):
1. The scheme aims to reduce poverty of the SC Communities.
 2. The scheme is implemented by the Ministry of Tribal Affairs.
 3. Pradhan Mantri Adarsh Gram Yojana is a sub-scheme to PM-AJAY.
- How many of the above statement(s) is/are correct?
- a) Only one b) Only two
c) All three d) None of the above
52. Consider the following statements with respect to Swami Vivekananda:
1. Vivekananda preached neo-Vedanta, an interpretation of Hinduism through a Western lens.
 2. He was the chief disciple of Ramakrishna Paramhansa and established the Ramakrishna Mission.
 3. The Powers of the Mind is a book written by Swami Vivekananda.
- How many of the above statement(s) is/are incorrect?
- a) Only one b) Only two
c) All three d) None of the above
53. Consider the following statements with respect to the Volatiles Investigating Polar Exploration Rover (VIPER) Mission:
1. It is a 100-day Mission conducted by NASA.
 2. It is a mobile robot to map resources on another celestial body.
 3. VIPER is part of NASA's Artemis mission.
- How many of the above statement(s) is/are correct?
- a) Only one b) Only two
c) All three d) None of the above
54. Arrange the following cities (cleaner to less cleaner) based on the recent Swachh Survekshan Awards, 2023:
1. Indore
 2. Mumbai
 3. Navi Mumbai
 4. Visakhapatnam
 5. Tirupati
- Choose the correct code:
- a) 5, 4, 3, 2, 1 b) 2, 4, 1, 3, 5
c) 3, 1, 4, 5, 2 d) 1, 2, 3, 4, 5
55. Consider the following statements with respect to the Atal Setu Nhava Sheva Sea Link:
1. It is the countries longest bridge over the Sea.
 2. The bridge is built over the Thane Creek in the Arabian Sea.
- Which of the above statement(s) is/are correct?
- a) 1 only b) 2 only
c) Both 1 and 2 d) Neither 1 nor 2
56. Consider the following statement:
1. The Kalaram temple derives its name from a black statue of the Lord Raam.
 2. The sanctum sanctorum has statues of Ram, Sita and Lakshman.
 3. It is located on the banks of the Narmada River.
- How many of the above statement is/are correct:
- a) Only one b) Only two
c) All three d) None
57. Consider the following statements with respect to Atal Setu
1. It is the longest sea bridge in the world.
 2. It is located in Mumbai.
- Which of the statement(s) given above is/are correct?
- a) 1 only b) 2 only
c) Both 1 and 2 d) Neither 1 nor 2
58. Consider the following statements with respect to Thylakoid Membranes
1. The thylakoid membrane is the site of photochemical and electron transport reactions of oxygenic photosynthesis.
 2. They are little pouches located in the chloroplasts of plants.
 3. They have the ability to store chlorophyll and can be found in cyanobacteria.
- How many of the statements given above are correct?
- a) Only one b) Only two
c) All three d) None of the above

- a) Only one b) Only two
c) All Three d) None of the above
91. Consider the following statements with respect to Binturong
1. It is the largest civet in India which need tall and healthy forests for their survival.
 2. It is native to the Western Ghats of India.
 3. They are classified as a vulnerable species under the International Union for Conservation of Nature (IUCN) red list.
- How many the above statement(s) is/are correct?
- a) Only one b) Only two
c) All three d) None of the above
92. Which of the following statements best defines the term "Gold Hydrogen"?
- a) It refers to hydrogen being produced by electrolysis using 'excess' electricity from renewable sources.
 - b) It refers to hydrogen derived from natural gas and emits carbon.
 - c) It refer to naturally occurring hydrogen found underground, akin to oil and natural gas.
 - d) It refers to hydrogen which is produced through electrolysis powered by nuclear energy.
93. Consider the following statements with respect to Alliance for Global Good- Gender Equity and Equality
1. It is an initiative of India with 'Invest India' as an 'Institutional Partner'.
 2. It aims to bring together global best practices, knowledge sharing and investments in the identified areas of women's health, education, and enterprise.
 3. The alliance will be housed and anchored by the CII Centre for Women Leadership.
- How many of the statements given above are correct?
- a) Only one b) Only two
c) All three d) None of the above
94. Consider the following statements with respect to Free Movement Regime, sometimes seen in the news recently
1. It allows people living in border areas of India and Myanmar to travel up to 16km inside the other country without a visa.
 2. The border free movement regime between the countries is traditionally called as Sunauli.
 3. India has recently decided to extend the free movement regime till 2030.
- Which of the above statement(s) is/are incorrect?
- a) Only one b) Only two
c) All three d) None of the above
95. Consider the following statements with respect to Foreign Contribution (Regulation) Act, 2010
1. The foreign source under the act does not include the contribution from the World Bank and International Monetary Fund.
 2. A political party or office bearer cannot receive foreign contribution under the act.
 3. The contributions made by a Non-Resident Indian from his personal savings, through the normal banking channels is not treated as foreign contribution.
- How many of the statements given above are correct?
- a) Only one b) Only two
c) All Three d) None of the above
96. Which of the following statement(s) are feature(s) of the Strategic Interventions for Green Hydrogen Transition (SIGHT) Programme?
- a) Financial incentive mechanisms to support domestic manufacturing of electrolyzers and production of Green Hydrogen.
 - b) They are key to the realisation of the objectives of the Nagoya Protocol.
 - c) The programme makes mandatory provisions for environmental costs in a government project/ programme.
 - d) All of the above.
97. Consider the following statements with respect to Nagara Architecture
1. It emerged during the 5th century CE, during the late Gupta period.
 2. The nagara style temples usually have elaborate boundary walls or gateways.
 3. The garbhagriha in the nagara style temples is always located directly under the tallest tower.
- How many of the statements given above are correct?
- a) Only one b) Only two
c) All Three d) None of the above
98. Consider the following statements with respect to Chabahar Port:
1. It is Iran's first deep-water port that is located on the Gulf of Oman.
 2. It is part of the proposed International North-South Transport Corridor (INSTC).
- Which of the above statement(s) is/are correct?
- a) 1 only b) 2 only
c) Both 1 and 2 d) Neither 1 nor 2
99. Consider the following statements with respect to Gangetic Dolphin
1. It is the national aquatic animal of India that are only found in four river systems around the world, including Ganga River.
 2. It is an ecosystem indicator species that is protected under the Schedule 1 of the Wildlife Protection Act, 1972.
 3. It is legally protected in all countries and categorised as endangered under the International Union for Conservation of Nature's Red List of threatened species.

- How many of the statements given above are correct?
- a) Only one b) Only two
c) All three d) None of the above
100. Consider the following statements with respect to Scrub Typhus:
1. Scrub typhus is an infectious seasonal disease caused by virus and transmitted through infected bats.
 2. Higher rainfall and humidity conditions decreases the incidents of the infection.
 3. There is no vaccination for this disease.
- How many of the above statement(s) is/are incorrect?
- a) Only one b) Only two
c) All Three d) None of the above
101. Consider the following statements with respect to Qanat System
1. The system identifies aquifers using underground tunnels and transport it to the surface.
 2. The system is indigenously developed by the Council for Scientific and Industrial Research - Water Research Institute (CSIR-WRI).
 3. This system can be built only in the delta plain regions.
- How many of the statements given above are correct?
- a) Only one b) Only two
c) All Three d) None of the above
102. Consider the following statements with respect to Batadrava Than
1. It is a holy prayer house founded by the revered Vaishnavite reformer-saint Srimanta Sankardeva.
 2. It is located in the state of Manipur.
 3. Doul Mahotsav is an annual festival that attracts the devotees in Bordowa Than.
- How many of the statements given above are correct?
- a) Only one b) Only two
c) All Three d) None of the above
103. Consider the following statements with respect to Pradhanmantri Suryodaya Yojana
1. It aims to reduce the electricity bill of the poor and middle class, along with making India self-reliant in the energy sector.
 2. It has a target of installing rooftop solar on 1 crore houses.
- Which of the statements given above is/are correct?
- a) 1 only b) 2 only
c) Both 1 and 2 d) Neither 1 nor 2
104. The Global Tree Assessment (GTA) is an initiative of which of the following organisation?
- a) United Nations Environment Programme (UNEP)
b) Global Environment Facility (GEF)
c) Intergovernmental Panel of Climate Change (IPCC)
d) International Union for Conservation of Nature (IUCN)
105. Consider the following statements with respect to Fusarium Acuminatum
1. It is a fungal plant pathogen that causes ripe rot in fuzzy kiwifruit.
 2. It is a known ice-nucleator that can freeze water better than bacteria.
- Which of the statements given above is/are correct?
- a) 1 only b) 2 only
c) Both 1 and 2 d) Neither 1 nor 2
106. Consider the following statements:
1. They are the largest, heaviest land animals.
 2. They are the natural heritage animal of India.
 3. The young ones of the species can walk within 1-2 hours of birth.
 4. They are categorized as Endangered by IUCN Red List.
- The above statement(s) correspond to which of the following species?
- a) Elephants b) Tigers
c) Hippopotamus d) Rhinoceros
107. Consider the following statements with respect to the Election Seizure Management System (ESMS):
1. It is a dedicated technology platform where all the enforcement agencies share information in real time.
 2. Only the Central enforcement agencies are allowed to share the information.
 3. The system was first used in the Parliamentary elections of 2019 in India.
- How many of the above statement(s) is/are incorrect?
- a) Only one b) Only two
c) All three d) None of the above
108. Consider the following statements with respect to the Parvatmala Pariyojana:
1. It is an initiative of the Ministry of Road Transport & Highways.
 2. Parvatmala Scheme aims to build sustainable and robust ropeway infrastructure in India.
 3. The funding is based on Private-Public Partnership (PPP) model.
- How many of the above statement(s) is/are correct?
- a) Only one b) Only two
c) All three d) None of the above
109. Which of the following statement(s) is associated with the term Muirburn, recently seen in news?
- a) Skin disease caused by a chemical components in cosmetics.
 - b) Thawing of ice sheets in the third pole of the world, Tibet.
 - c) It is a sacrifice practice followed by the Kamba Tribes.
 - d) Burning of vegetation to promote growth in moorland.

PRACTICE QUESTION FOR UPSC MAINS EXAM

1. What does the Union government's draft Broadcasting Services (Regulation) Bill mean for OTT platforms and content creators? How will the government ensure fair representation within the Content Evaluation Committee? What measures are proposed to prevent abuse of power during unannounced inspections?
2. Created in the shadow of the Cold War the global nuclear order (GNO) has held reasonably well, but is facing pressures under changing geopolitics. Comment and discuss.
3. Prioritising access to blood and its products remains fundamental to building a resilient global health architecture. Elaborate.
4. Online gaming addiction remains under-recognised by the Indian government and its policymakers. Discuss how China's success in regulating online gaming could serve as a crucial lesson for India?
5. Reforming the examination system to ensure its credibility is a key way to improve educational standards. Elaborate.
6. What are the roots of the IS's rivalry against Iran? Why did the IS target a memorial event of slain Iranian General Qassem Soleimani? Why has IS declared war on Iran? What is the Islamic Republic's medium and long-term strategy to take on the IS?
7. Why are girls getting married early despite receiving an education? Have the cash incentives for girls to study not been effective? What is the feedback from the districts? Is it a social problem or a political issue? What is the link between child marriage and poor maternal health?
8. What are the sections on hit-and-run in Bharatiya Nyaya Sanhita that have irked the sector? Why there is need to revisit the Section 106 (2) of BNS?
9. With further increase in tigers and Tiger Reserves, and tiger corridors to link them up, India's tiger terrain is set to become a hotspot not for biodiversity but anxiety and conflict. Critically analyse.
10. Discuss how recent Maldives fiasco can turn into a perennial source of regional friction with serious implications for the Indian Ocean region's economic prosperity and political stability.
11. Indian agritech is making impressive strides and expanding its global footprint, but it is still at a nascent stage and has penetrated only 1 percent of its potential market value. Elaborate.
12. How GM mustard was developed, why the question of its approval has now reached Supreme Court?
13. Has Israel violated the provisions of the Genocide Convention in its ongoing military campaign in Gaza? What are the allegations? What are the powers of the International Court of Justice? How long will it take for a ruling and is it binding?
14. In the Shiv Sena case in Maharashtra, the question as to which faction is the real party cannot be decided by the Speaker as the Tenth Schedule does not require him to decide this. Discuss and Comment.
15. On what basis has the Speaker of the Maharashtra Assembly refused to disqualify the MLAs? What is the history behind the anti-defection law? How can anti-defection laws be made stronger and impartial?
16. Why did the island of Nauru shift its diplomatic relations from Taiwan to China? What is the 1992 consensus? Do the younger generation of Taiwan identify with China?
17. 'The National Education Policy (NEP) 2020 can help ensure that a holistic approach towards the integration of technology with different functional requirements of the sector is undertaken'. Elaborate.
18. What is the strategic importance of Chabahar port for both Iran and India? What is the nature of India's involvement in the Chabahar port?
19. How has a confrontation between Israel and Hamas snowballed into a regional security crisis? Who are the key players in operation and why are they pulling in different directions? What are the apprehensions of a prolonged war for the region and the world?
20. The newly enacted Post Office Act, 2023 does not make any provision for procedural safeguards to dispel fears of misuse of the substantive provision on interception. Critically analyse.
21. Why has a high-level committee been formed post Prime Minister Narendra Modi's promise to the Madiga community in Telangana? What has the community been demanding since 1994? Can Parliament sub-categorise castes within the Scheduled Castes?
22. Discuss the challenges and policy recommendations for fostering growth in India's semiconductor industry, focusing on the Design-Linked Incentive scheme and potential reforms.
23. Discuss how the case of South Africa instituting proceedings against Israel in the International Court of Justice over the Gaza war is a vital stress test of the 'rules-based international order'?
24. While temperatures have been pretty low since December in north India, what has led to regions like Himachal Pradesh not receiving any snow? Is India in the midst of a snow drought? How do western disturbances play a part in the lingering dense fog?

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- | | | | | | | | | | |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| 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. (a) | 14. (b) | 15. (a) | 16. (a) | 17. (b) | 18. (c) | 19. (d) | 20. (c) |
| 21. (a) | 22. (b) | 23. (d) | 24. (a) | 25. (c) | 26. (a) | 27. (b) | 28. (c) | 29. (a) | 30. (d) |
| 31. (a) | 32. (b) | 33. (a) | 34. (c) | 35. (b) | 36. (b) | 37. (d) | 38. (d) | 39. (c) | 40. (d) |
| 41. (a) | 42. (b) | 43. (a) | 44. (a) | 45. (c) | 46. (a) | 47. (b) | 48. (d) | 49. (a) | 50. (b) |
| 51. (b) | 52. (d) | 53. (c) | 54. (d) | 55. (c) | 56. (a) | 57. (b) | 58. (c) | 59. (d) | 60. (d) |
| 61. (a) | 62. (b) | 63. (c) | 64. (d) | 65. (b) | 66. (a) | 67. (b) | 68. (c) | 69. (d) | 70. (c) |
| 71. (a) | 72. (b) | 73. (b) | 74. (a) | 75. (c) | 76. (b) | 77. (c) | 78. (c) | 79. (d) | 80. (c) |
| 81. (a) | 82. (b) | 83. (c) | 84. (d) | 85. (b) | 86. (a) | 87. (b) | 88. (c) | 89. (c) | 90. (b) |
| 91. (b) | 92. (c) | 93. (c) | 94. (b) | 95. (c) | 96. (a) | 97. (b) | 98. (c) | 99. (c) | 100. (b) |
| 101. (a) | 102. (b) | 103. (c) | 104. (d) | 105. (c) | 106. (a) | 107. (b) | 108. (c) | 109. (d) | 110. (c) |
| 111. (a) | 112. (c) | 113. (c) | 114. (d) | 115. (b) | 116. (a) | 117. (b) | 118. (c) | 119. (d) | 120. (a) |



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