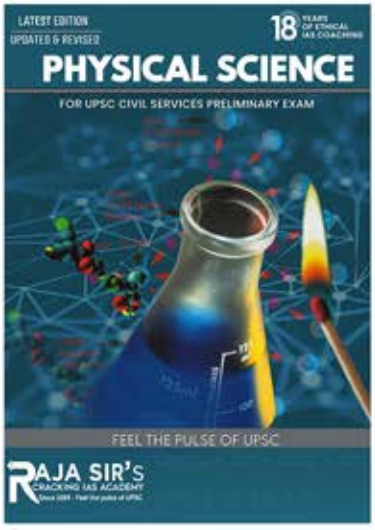
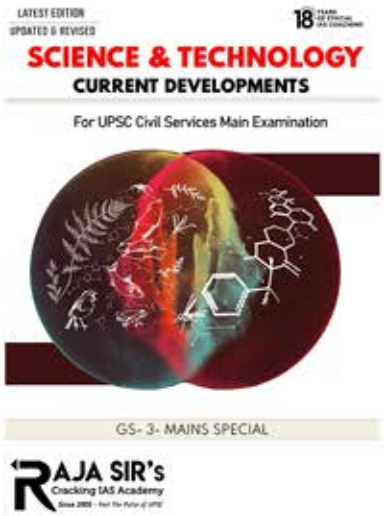
MONTHLY CURRENT AFFAIRS





Rule 176 vs Rule 267

Rule 267 - Any member, may, with the consent of the Chairman, move that any rule may be suspended in its application to a motion related to the.....

PFRDA to allow funds to invest in sovereign green bonds

The Government of India is expected to issue sovereign green bonds in the second half of the current financial year as part of the overall market borrowing programme.....

Gambusia: This solution could actually be an invasive problem

IThe Andhra Pradesh government has released approximately 10 million Gambusia fish into the state's water bodies to combat mosquito-borne

Long Covid 'brain fog' equivalent to ageing 10 years, shocking study finds

Brain fog itself is not a medical condition but instead a symptom of other medical conditions. It is a term used to describe a variety of symptoms that can affect your ability to think clearly.

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POLITY

Three-judge bench to hear pleas relating to criminalisation of marital rape: Supreme Court

The Supreme Court on July 19 said that a three-judge bench will hear a batch of petitions pertaining to criminalisation of marital rape after constitution benches conclude hearing some listed pleas.

Out of 185 countries in the world, **77 have laws that clearly criminalise marital rape** while there are **34 countries that explicitly decriminalise marital rape,** or in essence, offer immunity to men who perpetrate rape against their wives.

- **India**, is one of the 34 countries that have **decriminalised marital rape.**

Indian Law on Marital Rape

- **Section 375 of the Indian Penal Code (IPC):**
  - Section 375 of the **IPC** defines the acts that constitute rape by a man.
  - The provision, however, lays down **two exceptions** as well.
    - Apart from decriminalising marital rape, it mentions that **medical procedures or interventions shall not constitute rape.**
    - **Exception 2 of Section 375** of the Indian Penal Code states that "sexual intercourse by a **man with his wife**, and if the wife **not being under fifteen years of age, is not rape".**
  - In October 2017, the Supreme Court of India increased the age to 18 years.
- **Domestic Violence Act, 2005:**
  - It hints at marital rape by **any form of sexual abuse** in a live-in or marriage relationship.
  - However, it only provides for **civil remedies**. There is no way for marital rape victims in India to initiate **criminal proceedings** against their perpetrator.

History of the Marital Rape Law in India

- **Judiciary:**
  - **Delhi High Court:**
    - The Delhi **High Court** has been hearing arguments in the case since 2015.
    - In January 2022, two judges of the Delhi High Court started to hear petitions filed by individuals and civil society organisations challenging the exemption.
    - By May 2022, **they had arrived at a controversial split verdict.** One judge was in **favour of criminalising marital rape** as it violated a woman's right to consent, while the **other was against it,** saying marriage "necessarily" implied consent.
    - The matter was pushed to the **Supreme Court.**
  - **Supreme Court:**
    - In September 2022, a Supreme Court ruling on **women's right to safe abortions** regardless of marital status held that for the purposes of the **Medical Termination of Pregnancy Act,** the definition of rape should include marital rape.
  - **Law Commission of India:**

        - The need to remove the marital rape exception was rejected by the **Law Commission of India** in 2000, while considering several proposals to reform India's laws on sexual violence.
    - **Justice JS Verma Committee:**
        - In 2012, the **Justice JS Verma Committee** was tasked with proposing amendments to India's rape laws.
        - While some of its recommendations helped shape the **Criminal Law (Amendment) Act passed in 2013**, some suggestions, including that on marital rape, were not acted on.
- **Parliament:**
    - The issue has been brought up in **Parliament** as well.
    - Upon being questioned in a Parliament session in 2015, the idea of criminalising marital rape was dismissed with the view that "marital rape cannot be applied in the country since marriage was treated as a sacrament or sacred in the Indian society".
- **Government's Stand:**
    - The Central Government **initially defended the rape exception** and later changed its stand and told the court that **it was reviewing the law,** and that "wider deliberations are required on the issue".
    - The Delhi government **argued in favour of retaining the marital rape exception.**
        - The government's arguments spanned from protecting men from possible misuse of the law by wives, to protecting the institution of marriage.

Issues with Marital Rape Exception

- **Against Basic Rights of Women:**
    - This exception clause violates the women's **fundamental right to equality, freedom of speech and expression,** and most of all the **right to life and personal liberty.**
        - It also denies the agency over their own bodies to women.
- **Dismal State of Judicial System:**
    - Some of the reasons for low rates of prosecution in the cases of marital rape in India include:
        - Low reporting of crimes due to **societal conditioning and low legal awareness.**
        - Inaccurate method of collection of **National Crime Records Bureau (NCRB)** data.
        - **Out of court settlements** due to the lengthy process of justice/lack of admissible proof.

Exception on Marital Rape find its way into the IPC

- **British Colonial Rule:**
    - The IPC was implemented in India during **British colonial rule in 1860.**
        - Under the first version of the rules, the marital rape exception was applicable to **women over 10 years of age** which was raised to 15 in 1940.
- **1847 Draft of Lord Macaulay:**
    - In January 2022, it was argued by **amicus curiae** (friend of the court)

that the IPC is based on the **1847 draft of Lord Macaulay**, the chairman of the **First Law Commission** established in colonial-era India.
        - The exception in the draft **decriminalised marital rape** without any age limit.
    - The provision is an age-old idea that implies consent by married women and protects the conjugal rights of the husband.
    - The idea of implied consent comes from the **Doctrine of Hale,** given by Matthew Hale, the then **British Chief Justice**, in 1736.
        - It states that a **husband cannot be guilty of rape**, since "by their mutual matrimonial consent and contract the **wife has given up herself in this kind to the husband".**
- **Doctrine of Coverture:**
    - According to the Doctrine of Coverture, a woman has **no individual legal identity after marriage.**
    - Notably, the Doctrine of Coverture found a mention during the hearing when the **Supreme Court of India struck down adultery as a criminal offence** in 2018.
        - It was held that **Section 497,** that classified adultery as a crime, is based on the **Doctrine of Coverture.**
    - This doctrine, although not recognised by the Constitution, holds that a **woman loses her identity and legal rights with marriage**, is violative of her fundamental rights.

Marital Rape around the World

- **About:**
    - The **United Nations** has urged countries to end marital rape by closing legal loopholes, saying that **"the home is one of the most dangerous places for women".**
- **Countries that have Criminalised Marital Rape:**
    - **United States–** From 1993, Marital Rape was criminalised in all 50 states of the US but laws differ from state to state.
    - **United Kingdom–** Marital rape has also been criminalised in the UK and those found guilty could be sentenced to life imprisonment.
    - **South Africa-** Marital rape has been illegal since 1993 in South Africa.
    - **Canada–** Marital Rape is punishable in Canada.
- **Countries that have not Criminalised Marital Rape:**
    - Ghana, India, Indonesia, Jordan, Lesotho, Nigeria, Oman, Singapore, Sri Lanka and Tanzania haven't expressly criminalised marital rape of a woman or a girl by her husband.

SC Collegium recommends elevation of four advocates as judges to 3 HCs

Collegium

- **It is a system** under which **appointments and transfers of judges are decided by a forum of the Chief Justice of India and the four senior-most judges** of the Supreme Court.
- It has **no place in the Indian Constitution.**
- **What does the Constitution actually prescribe?**
    - **Article 124 deals** with the **appointment of Supreme Court judges**. It

says the appointment should be **made by the President after consultation with such judges of the High Courts and the Supreme Court as the President may deem necessary.** The **CJI is to be consulted in all appointments**, **except his or her own**.
    - **Article 217 deals** with the **appointment of High Court judges**. It says a judge should be **appointed by the President after consultation with the CJI and the Governor of the state.** The **Chief Justice of the High Court** concerned **too should be consulted.**
- **Evolution of Collegium system:**
    - Since **Constitution mandates consultation with the CJI** is necessary for appointments to judiciary, the collegium model evolved.
    - It **has its genesis in** a series of three judgments that is now clubbed together as **the Three Judges Cases**.
    - **First Judges Case (1982):**
        - **SC held that "consultation"** of judges **does not mean concurrence.**
        - Hence, it **gave the primacy in appointment** of judges to **the Executive.**
    - **Second Judges Case (1993):**
        - Court **reversed its earlier ruling** by **changing the meaning of "consultation" to concurrence.**
        - With this, the **advice tendered by CJI became binding**. However, **the CJI** would **have to take into account the views of two of his senior most colleagues.**
    - **Third Judges Case (1998):**
        - Court **gave primacy to the opinion of CJI** in the matter of appointment of Judges.
        - **However, Chief Justice must consult four senior most judges** of SC.
        - **Opinion of all members** of the collegium **should be in writing.**
        - **Even if two judges** in the collegium **give an adverse opinion** of a person for appointment as the SC judge, **the CJI should not send the recommendation to the government.**
- These three cases **established that the collegium** headed by the Chief Justice of India will **have primacy in the appointment of judges to the higher judiciary**.
- This collegium **makes recommendations to the government for appointment of judges to the SC and of Chief Justices of High Courts, and the transfers of HC judges**.
- **In case of difference of opinion, the majority view will prevail**.
- **Executive role:**
    - **Judges of the higher judiciary** are thus **appointed only through the collegium system**, and the **government has a role only after names have been decided** by the collegiums.
    - The government's role is li**mited to getting an inquiry conducted by the Intelligence Bureau (IB) if a lawyer is to be elevated as a judge in a High Court or the Supreme Court.**
    - The **government can also raise objections and seek clarifications**

regarding the collegium's choices, **but if the collegium reiterates the same names**, the **government is bound to appoint them.**

- **Procedure for appointment of Judges to High Courts:**
  - For appointments or elevations to the high courts, the **HC collegium (The HC Chief Justice + 2 senior-most judges) makes the recommendation to the state government.**
  - The **State Government sends the names to the Centre with its input.**
  - The **Centre gives the names to the Intelligence Bureau (IB)** to conduct background checks.
  - The **IB then sends its report to the Supreme Court Collegium** (CJI + 2 Senior-most judges).
  - The **SC Collegium goes through the IB report and recommends** the names **to the Centre for appointment.**

ECI to issue digital time vouchers to National & State

Digital Time Vouchers

- The Election Commission of India has amended the existing scheme for the use of Government-owned electronic media by political parties.
- This has been done by introducing a provision to issue **digital time vouchers** through an **Information Technology (IT) platform.**
- Each party shall be given **time Vouchers of different denominations** of, 5 minutes and 10 minutes, equal to the total time allotted to it for telecasts on Doordarshan and broadcasts on AIR.
- That party shall have the discretion to choose any representatives and allow them to use those time vouchers provided that **no such individual representative** shall be allowed **to use more than 20 minutes** of the total time allotted to that party, either on Doordarshan or on AIR.
- **Background**
  - The scheme was initially notified on 16th January 1998, holds a statutory basis under Section 39A of **the Representation of People Act, 1951.**
  - It aimed at ensuring equitable access to government-owned electronic media during elections for campaigning.
  - Under this Scheme, an equitable base time is allotted to **each National Party and Recognized State Party of the state** concerned uniformly on DD & AIR.
  - The additional time to be allotted to the parties is decided on the basis of the poll performance of the parties in the last assembly elections from the respective States/UT or in the last general Elections to Lok Sabha, as the case may be.
  - The actual date and time during which the above telecasts/broadcasts will be made by the authorised representatives of any party is predetermined, by a lot, by the **Prasar Bharati Corporation in consultation with ECI** and in the presence of political party representatives.

Nearly half of MLAs in India have criminal records: ADR analysis

A recent analysis conducted by the Association for Democratic Reforms (ADR) has claimed that an approximate 44 per cent of MLAs in State Assemblies across India have declared criminal cases against themselves.

Legal Aspect of Disqualification of Criminal Candidates

- In this regard, Indian Constitution does not specify as to what disqualifies a person from contesting elections for the Parliament, Legislative assembly or any other legislature.
- **The Representation of Peoples Act 1951** mentions the **criteria for disqualifying a person for contesting an election** of the legislature.
    - **Section 8 of the act**, i.e. disqualification on conviction for certain offences, according to which an individual punished with a jail term of more than two years cannot stand in an election for six years after the jail term has ended.
    - The **law does not bar individuals who have criminal cases pending against them** from contesting elections therefore the disqualification of candidates with criminal cases depends on their conviction in these cases.

Section 69 (A), under which Govt has asked social media platforms to take down Manipur video

- Some links have been shared with social media companies to take down the video as it could further disrupt the law and order situation in the state
- The Centre has powers to issue content takedown orders to social media companies under **Section 69 (A)** of the Information Technology Act, 2000.

Section 69 (A) of the IT Act

Section 69 of the IT Act allows the government to issue content-blocking orders to online intermediaries such as **Internet Service Providers (ISPs)**, telecom service providers, web hosting services, search engines, online marketplaces, etc. The Section requires the information or content being blocked to be deemed a threat to **India's national security, sovereignty, or public order.**

Supreme Court on Section 69 (A)

- In a landmark 2015 ruling, the Supreme Court in **Shreya Singhal vs Union of India** struck down **Section 66A** of the Information Technology Act of 2000, which entailed punishment for sending offensive messages through communication services, etc. The plea had also challenged Section 69A of the Information Technology Rules 2009, but the SC held this to be "**constitutionally valid**".
- It will be noticed that Section 69A unlike Section 66A is a narrowly drawn provision with several safeguards.
- First and foremost, blocking can only be resorted to where the Central Government is satisfied that it is necessary to do so.
- Secondly, such necessity is relatable only to some of the subjects set out in Article 19(2).
- Thirdly, reasons have to be recorded in writing in such blocking order so that they may be assailed in a writ petition under Article 226 of the Constitution.

Rule 176 vs Rule 267

The opening day of the Monsoon Session of Parliament was disrupted on Thursday

after the government and the Opposition differed on the format of the discussion on the Manipur situation. While the government agreed for a short-duration discussion, the Opposition insisted that the Prime Minister make a suo motu statement followed by a discussion, **suspending all business under Rule 267**.

What is Rule 267, and Rule 176

- Rule 267 - Any member, may, with the consent of the Chairman, move that any rule may be suspended in its application to a motion related to the business listed before the Council of that day and if the motion is carried, the rule in question shall be suspended for the time being: Provided further that this rule shall not apply where specific provision already exists for suspension of a rule under a particular chapter of the Rules.
- Short-duration discussion, on the other hand, is a brief discussion not exceeding two-and-a-half hours under Rule 176.
- Rule 176 - Any member desirous of raising discussion on a matter of urgent public importance may give notice in writing to the Secretary-General specifying clearly and precisely the matter to be raised: Provided that the notice shall be accompanied by an explanatory note stating reasons for raising discussion on the matter in question: Provided further that the notice shall be supported by the signatures of at least two other members.
- Once the Chairman admits the notice, the rules say he, in consultation with the Leader of the Council, will fix the date on which such matter may be taken up for discussion and allow such time for discussion, not exceeding two and a half hours.
- It means that a short-duration discussion under Rule 176 can be taken up immediately, a few hours later, the next day or can be fixed for a later date and time.
- But the rule says there shall be no formal motion or voting under a short duration discussion. "The member who has given notice may make a short statement and the Minister shall reply shortly," the rule says.

Dhankhar reconstitutes Rajya Sabha panel of vice-chairpersons, half of them women

Panel of Vice-Chairpersons

- Under the Rules of Rajya Sabha, the **Chairman nominates** from amongst the members a panel of vice-chairpersons.
- Any one of **them can preside over the House** in the **absence of the Chairman** or the **Deputy Chairman**.
- He/she has the same powers as the Chairman when so presiding.
- He/she holds office until a new panel of vice-chairpersons is nominated.
- When a member of the panel of vice chairpersons is also not present, any other person as determined by the House acts as the Chairman.
- It must be emphasised here that a **member of the panel of vice chairpersons cannot preside over the House**, when the office of the **Chairman or the Deputy Chairman is vacant.**
- During such time, the Chairman's duties are to be performed by such member of the House as the **president may appoint for the purpose.**
- The elections are held, as soon as possible, to fill the vacant posts.

Cinematograph Amendment Bill 2023 introduced in Rajya Sabha; aims to tackle film piracy

Cinematograph (Amendment) Bill 2023

- It seeks to **amend the Cinematograph Act 1952.**
- It has provisions for **harsher punishment for film piracy** and the **introduction of new-age categories for classifying films.**
- **Film Classification:**
    - It has provisions to **classify films on the basis of age group instead of the current practice of rating them** "U" (unrestricted public exhibition), "A" (restricted to adult audiences), and "UA" (unrestricted public exhibition subject to parental guidance for children below the age of 12).
    - The amendments **seek to add new classifications – 'UA-7+', 'UA-13+', and 'UA-16+' in place for 12 years.**
    - It also **seeks to bring about uniformity in categorisation of films and content** across platforms.
- **Stricter Laws Against Piracy:**
- The Bill holds **stricter punishment for those responsible for piracy**. This **includes three years of imprisonment and a Rs 10 lakh penalty** for those engaged in piracy.
- Once the Bill is released, the **act of piracy will be considered an offence legally and will include even transmitting pirated content punishable.**

Cinematograph Act 1952

- It was enacted by the Parliament **to ensure that films are exhibited in accordance with the limits of tolerance of Indian society.**
- It **establishes Central Board of Film Certification**(CBFC, popularly **known as the censor board**) **appointed by the Central Government to sanction and certify films**.
- The Board **scrutinizes the film in its entirety** and based on the contemporary standard of Indian society following the procedure laid down under the Act.
- Board can **either make a speaking order of rejection or grant the certificate**, which shall be **valid for ten years.**
- The Act also **authorizes the police to conduct search and seizure if the film is being exhibited in contravention** of any of the provisions of the Act.

What is an adjournment motion, moved by Congress MPs in Parliament?

As Opposition parties demanded a discussion on the alleged sexual assault of at least two women in Manipur, amid the ongoing ethnic violence in the state, the day two of the Monsoon Session of Parliament proceedings saw the Lok Sabha **being adjourned**

- **Adjournment motion** is introduced **only in the Lok Sabha** to draw the attention of the House to a definite matter of urgent public importance.
    - It involves an **element of censure** against the government, therefore Rajya Sabha is not permitted to make use of this device
- It is regarded as an **extraordinary device** as it interrupts the normal business of the House. It needs the **support of 50 members** to be admitted.
- The **discussion** on this motion should **last for not less than two hours and**

thirty minutes.

- However, right to move a motion for an adjournment of the business of the House is **subject to the following restrictions.** i.e. It should:
    - Raise a **matter** which is definite, factual, urgent and of public importance.
    - Not cover **more than one matter.**
    - Be restricted to a specific **matter of recent occurrence.**
    - Not raise a **question of privilege.**
    - Not revive discussion on a matter that has been discussed in the **same session.**
    - Not deal with any matter that is **under adjudication of court.**
    - Not raise any question that can be raised on a **distinct motion.**

Second Wife Can't File Cruelty Case Against Husband

Section 498A of IPC

- It deals with the **criminal offense of "cruelty by husband or relatives of husband" towards a married woman.**
- This section was **introduced in 1983 as an amendment to the IPC** to **address the growing concern of domestic violence** and harassment **faced by married women** in India.
- Under Section 498-A IPC, a **husband or his relatives can be sentenced to a jail term of three years for subjecting the wife to cruelty.**
- The section **applies to married women only.**
- **Section 498A of IPC reads as** "Whoever, being the husband or the relative of the husband of a woman, subjects such woman to cruelty shall be punished with imprisonment for a term which may extend to three years and shall also be liable to fine".
- For the purposes of this section, '**cruelty**' **means:—**
    - **any wilful conduct** which is of such a nature as is **likely to drive the woman to commit suicide or to cause grave injury or danger to life**, limb or health (**whether mental or physical**) of the woman; or
    - harassment of the woman where such harassment is with a view to **coercing her or any person related to her to meet any unlawful demand for any property or valuable security o**r is on account of failure by her or any person related to her to meet such demand."
- The **term "cruelty" is comprehensive, encompassing various forms of abuse** that can be inflicted upon a married woman.
- **Bail under Section 498A:**
    - Section 498A of the Indian Penal Code, enacted in 1860, is a **non-compoundable and cognizable offence.**
    - **Bail** under Section 498A **can only be granted by the Magistrate once a First Information Report (FIR) has been registered by the police** based on a complaint filed by the aggrieved party.
- The **Supreme Court has ruled that Section 498A should be used sparingly** and only in cases where there is genuine evidence of cruelty.
- The court has also **ruled that the section should not be used as a tool to settle personal scores.**

Other Indian laws to help curb the instances of violence against women are,

- **Protection of Women from Domestic Violence Act**, 2005 (PWDVA);
- **Dowry Prohibition Act, 1961;**
- **Sexual Harassment of Women at Workplace** (Prevention, Prohibition, and Redressal) **Act, 2013**;
- **Indian Penal Code (IPC) Amendments**: Various amendments to the IPC have been made to address violence against women, including:
    - **Section 376: Dealing with punishment for rape**, with stricter provisions for different types of rape offenses.
    - **Section 354: Addressing criminal assault or use of criminal force against women with intent to outrage her modesty**.
    - **Section 354A: Dealing with sexual harassment** and punishment for the same.
    - **Section 354D**: **Criminalizing stalking** and providing punishment for the offense.
    - **Section 509: Dealing with words, gestures, or acts** intended to insult the modesty of a woman.
- **Criminal Law (Amendment) Act, 2013**: This act was passed in **response to the Nirbhaya case** and brought significant **changes to laws dealing with sexual offenses**. It included provisions for **stricter punishments for rape, gang rape, and acid attacks**, among others.

More than 87,000 Indians gave up their citizenship till June, says S Jaishankar

Modes of losing Indian Citizenship

- The **Citizenship Act 1955 lays down the three modes by which an Indian citizen**, whether a citizen at the commencement of the Constitution or subsequent to it, **may lose their citizenship. These are,**
- **By Renunciation:**
    - An Indian **Citizen of full age and capacity can renounce** his Indian citizenship **by making a declaration** to that effect **and having it registered.**
    - But **if such a declaration is made during any war** in which India is engaged, **the registration shall be withheld** until the Central Government otherwise directs.
    - **When a male person renounces his citizenship, every minor child of him ceases to be an Indian citizen.**
    - **Such a child may, however, resume Indian citizenship** if he makes a declaration to that effect within a year of **his attaining full age, i.e., 18 years**.
- **By Termination:**
    - **If a citizen of India voluntarily acquires citizenship of another country,** then the **citizenship of India gets terminated.**
    - This provision **does not apply during times of war.**
    - **If any question arises** as to whether, when, or how any person has acquired the citizenship of another country, **it is to be determined by such authority** and in such manner **as may be prescribed by the rules.**
- **By Deprivation:**

- **It is a compulsory termination of citizenship** of India.
- A citizen of India by naturalization, registration, domicile and residence may be **deprived of his citizenship by order of the Central Government if it is satisfied that:**
  - The **citizen has obtained the citizenship by means of fraud**, false representation, or concealment of any material fact;
  - The citizen has **shown disloyalty to the Constitution** of India;
  - The citizen has **unlawfully traded or communicated with the enemy during a war;**
  - The **citizen has, within five years after registration or neutralization, been imprisoned in any country for two years;**
  - The citizen has been **ordinarily resident out of India for seven years;**

NCPCR writes to Manipur DGP, seeks FIR against CPM leader, 2 others

National Commission for Protection of Child Rights (NCPCR)

- NCPCR is a **statutory body** established by an Act of Parliament, the **Commission for Protection of Child Rights (CPCR) Act, 2005.**
- It works under the **aegis of the Ministry of Women and Child Development.**
- The Commission **began operational on 5 March 2007.**
- **As defined by the commission, a child includes a person up to the age of 18 years.**
- **Mandate**: The Commission is mandated under section 13 of the CPCR Act, 2005 "**to ensure that all Laws, Policies, Programmes**, and Administrative Mechanisms **are in consonance with the Child Rights perspective as enshrined in the Constitution** of India **and the UN Convention** on the Rights of the Child."
- The Commission is **further mandated to monitor** the proper and **effective implementation of**
  - Protection of Children from Sexual Offences (**POCSO) Act, 2012**.
  - **Juvenile Justice** (Care and Protection of Children**) Act, 2015.**
  - Right to Free and Compulsory Education (**RTE) Act, 2009.**
- **Members**:
  - **A chairperson** who, is a **person of eminence** and has **done outstanding work for promoting the welfare of children.**
  - **Six members, out of which at least two are women**, who are **having experience in Education, Child Health**, Juvenile justice, Elimination of child labour, Child psychology or sociology Laws relating to children.
  - The members are **appointed by the Central Government for a term of 3 years.**

The 'free movement regime' along the India-Myanmar border, and why it has complicated the volatile situation in Manipur

The border between India and Myanmar runs for 1,643 km in the four states of Mizoram, Manipur, Nagaland, and Arunachal Pradesh. The FMR allows tribes living along the border on either side to travel up to 16 km inside the other country,

without a visa.
The illegal migration of tribal Kuki-Chin peoples into India from Myanmar is one of the key issues in the ongoing ethnic conflict between Meiteis and Kukis in Manipur.
Free Movement Regime on the IMB

- The border between India and Myanmar runs for 1,643 km in the four states of **Mizoram, Manipur, Nagaland, and Arunachal Pradesh**. The FMR is a mutually agreed arrangement between the two countries that allows tribes living along the border on either side to travel up to 16 km inside the other country without a visa.
- The **FMR was implemented in 2018** as part of the Narendra Modi government's Act East policy at a time when diplomatic relations between India and Myanmar were on the upswing. In fact, the FMR was to be put in place in 2017 itself, but was deferred due to the Rohingya refugee crisis that erupted that August.

Why was such a regime conceptualised?

- The border between India and Myanmar was demarcated by the British in 1826, without seeking the opinion of the people living in the region. The border effectively divided people of the same ethnicity and culture into two nations without their consent. The current IMB reflects the line the British drew.
- People in the region have strong ethnic and familial ties across the border. In Manipur's **Moreh region**, there are villages where some homes are in Myanmar.
- In Nagaland's Mon district, the border actually passes through the house of the chief of Longwa village, splitting his home into two.
- The region has a long history of trans-border commerce through customs and border haats. Given the low-income economy, such exchanges are vital for the sustenance of local livelihoods. For border people in Myanmar too, Indian towns are closer for business, education, and healthcare than those in their own country.

FMR being discussed critically

- FMR has been criticised for unintentionally aiding illegal immigration, drug trafficking, and gun running.
- Since the military coup in Myanmar on February 1, 2021, the ruling junta has launched a campaign of persecution against the **Kuki-Chin peoples**. This has pushed large numbers of Myanmarese tribals across the country's western border into India, especially into Manipur and Mizoram, where they have sought shelter.
- Mizoram, where a large section of the population has close ethnic and cultural ties with people across the border, has set up camps for more than 40,000 refugees, despite protests from the Union Ministry of Home Affairs.

Why multiple committees for reviewing pesticide ban, SC asks government

The apex court sought the reason for appointing several committees when the initial panel had already recommended the banning of 27 pesticides
The apex court sought the reason for appointing several committees when the initial expert panel had already recommended the banning of 27 pesticides.
The bench also raised questions over

- 2015 **Anupam Varma Committee report**, which recommended banning 13 pesticides out of the list of 66 sought to be reviewed by the petitioners. The report saw resistance from the pesticide industry association.
- SK Malhotra Committee in 2017, seeking a review on banning 27 pesticides. The committee reinstated the need to ban 27 pesticides in 2018.
- Another sub-committee headed by SK Khurana was later appointed by the Pesticide Registration Committee, an apex body that regulates pesticides in India, to review the banning of 27 pesticides. This committee, too, recommended banning certain pesticides in 2020.
- Anupam Varma Committee and Khurana Committee had proposed banning of same 27 pesticides. Despite this, another committee was formed (Rajendran Committee), which offered contrary recommendations

Akhil Bhartiya Shiksha Samagam 2023

Pradhan Mantri Schools for Rising India (PM-SHRI) Scheme:

- It is a **Centrally Sponsored scheme announced in 2022.**
- **Development of more than 14500 schools across the country by strengthening selected existing schools** b**eing managed by Central Government/ State**/ UT Government/ local bodies.
- The **duration of the scheme is from 2022-23 to 2026-27,after which** it shall be the **responsibility of the States/UTs to continue to maintain the benchmarks achieved** by these schools.
- **Features:**
    - The s**elected schools will act as exemplar schools showcasing all components of the National Education Policy 2020 (NEP)** and o**ffering mentorship to other schools** in their vicinity.
    - The **PM SHRI Schools will be developed as Green Schools**, incorporating environment-friendly aspects.
    - The **pedagogy adopted** in these schools **will be more experiential, holistic, integrated, play/toy-based** (particularly in the foundational years), **inquiry-driven,** discovery-oriented, learner-centric, discussion-based, flexible and enjoyable.
    - The **focus will be on the learning outcomes of every child in every grade.**
    - **Assessment at all levels will be based on conceptual understanding and application of knowledge** to real-life situations and will be **competency-based.**
    - **Linkage with Sector Skill Councils and local industry** for enhancing employability and providing better employment opportunities will be explored.
    - **A School Quality Assessment Framework (SQAF)** is being developed, specifying the key performance indicators to measure outcomes. Quality evaluation of these schools at regular intervals will be undertaken to ensure the desired standards.

Government suspends International Institute for Population Sciences Director James for 'hiring irregularity'

International Institute for Population Sciences

- It was formerly known as the Demographic Training and Research Centre (DTRC) till 1970.
- It was established in July 1956 under the **joint sponsorship of Sir Dorabji Tata Trust, the Government of India and the United Nations.**
- It serves as a regional centre for Training and Research in **Population Studies for the ESCAP region.**
- The Institute was re-designated to its present title in 1985 to facilitate the expansion of its academic activities.
- It was declared as a 'Deemed to be University' on August 14, 1985, under Section 3 of the UGC Act, 1956 by the Ministry of Human Resource Development, Government of India.
- The recognition has facilitated the award of recognized degrees by the Institute itself and paved the way for further expansion of the Institute as an academic institution.
- IIPS holds a unique position among all the regional population centres.
- It was the first such centre started, and it serves a much larger population than any of the other regional centres.
- The Institute is under the **administrative control** of **the Ministry of Health and Family Welfare, Government of India.**
- Institute had conducted many prime surveys like National Family Health Survey (NFHS), District Level Household Survey (DLHS), Assessment of National Rural Health Mission (NRHM), YOUTH in India Project etc.

RPF man held for killing 4 on train: What is this force, and how is it different from the GRP?

Railway Protection Force (RPF)

- The RPF is an armed force under the operational and administrative control of the Union Ministry of Railways, which is tasked with protecting and securing railway property, the passenger areas, and the passengers themselves.
- The RPF was set up as a consequence of The Railway Protection Force Act, 1957, enacted by Parliament "to provide for the constitution and regulation of an armed force of the Union for the better protection and security of railway property and for matters connected therewith". The Act came into force after Parliament passed significant modifications to it through The Railway Protection Force (Amendment) Act, 1985 (Act No. 60 of 1985). Rules under the Act were notified in 1987.
- The RPF is led by a director-general.

How was the RPF created, and with what reasons?

- RPF has its origins in the 'Watch and Ward' set-up of the private railway companies during the time of the British Raj. "In the mid-forties, the portion of the Watch and Ward staff which remained under the control of these (private) Railways, was found inadequate to control thefts of their assets and consignments,"
- This led to the enactment of the RPF Act, 1957, which, after the amendments of 1985, "gave the RPF exposure to the other forces. It gained in maturity as it was regularly being deployed for assisting the State Police Forces". In 2003, according to the website, the RPF Act and Railways Act were modified, and

"the RPF partially took up the duties of escorting of passenger trains and access control at the railway stations".

What is the Government Railway Police (GRP)?

- The GRP is a part of the district police force, reporting to the state government. It works alongside the RPF, and should, under ideal circumstances, complement and strengthen its operations.
- According to the Indian Railways website, "The Government Railway Police are responsible generally for the prevention and detection of crime on railways". But their remit does not extend to protecting Railway property: "The protection of goods sheds, goods wagons at stations and parcel offices is not duty of the Railway Police, but of the Railway Protection Force of the Railway," says the website.

GRP's job?

According to the Railways website, "the duties of the Government Railway Police as regards the areas in their jurisdiction correspond in general to those of the District Police in the areas under their charge". In addition, the GRP has some "special duties", including:

(i) to maintain order at railway stations and in trains, wherein "order" refers to "control of passenger traffic within station premises, especially on platforms, in booking offices, waiting halls, at entrance and exit gates" etc., "control of vehicular and other traffic in station precincts", "maintenance of order in passenger trains halted at stations and prevention of overcrowding in carriages", "arrest of persons guilty of committing nuisance", etc., and "to render assistance to railway officers and to the traveling public in so far as the rendering of such assistance is compatible with their own duties as Police officers".

The Railways website says that "with the introduction of amendment in RPF and Railways Act, implications for GRP are:

- 36,600 GRP personnel of the country will be able to focus their attention on heinous crimes specially rape in trains and other crimes against women.
- While GRP will continue to do policing for Railways, it will get more time to concentrate on investigation of heinous crimes.
- GRP can be utilised for track patrolling and for effective investigation in cases of sabotage as defined in sections 150, 151 & 152 of The Railways Act."

How do the RPF and GRP work together

As the Government Railway Police (GRP) is organised on provincial lines, there is no continuity of jurisdiction. For instance, for a distance of 70 kilometres involving travel time of about an hour, between Ambala to Kalka, four GRP units look after a passenger. A seamless line of control and a single chain of command is lacking because of the boundaries of States and therefore, of their Police Forces."

The RPF points to the "dilemma" of passengers in the current system: "With a multiplicity of security agencies operating on the Railway i.e. the Railway Protection Force (RPF), the Government Railway Police (GRP) and the District Police, he is confused and not sure whom to report to in case of a crime on the railway. For an ordinary passenger every man in khaki on the platform is a policeman."

Centre launches ULLAS mobile application to promote basic literacy

ULLAS Initiative

- The **Understanding Lifelong Learning for All in Society (ULLAS)** initiative

is poised to revolutionise education and literacy across the nation.

- It is done by **fostering a learning ecosystem** that reaches every individual, bridging the gaps in basic literacy and critical life skills.
- It **imparts basic education**, digital and financial literacy and critical **life skills to citizens aged 15 and above** who lost on the opportunity to go to school. It is being implemented through volunteerism.
- **Slogan of the Initiative:** ULLAS: Nav Bharat Saksharta Karyakram.
- For this purpose **ULLAS app** was launched which is user-friendly and interactive **app available both on android and ios.**
- It will serve as a digital gateway for learners to engage in **diverse learning resources through the DIKSHA portal of NCERT.**
- The ULLAS app can be used for registration of learners and volunteers either through self-registration or by surveyors.
- **Significance**
    - This app will **focus on promoting functional literacy, vocational skills**, and many important life skills like financial literacy, legal literacy, digital literacy, and empowerment of citizens to involve in nation-building of the country.
    - It also fosters a culture of **continuous learning and knowledge-sharing** in communities across India.

Delhi govt. moves SC to quash ordinance giving L-G control over services

- **Article 123** of the Indian Constitution **grants the President** of India **certain Lawmaking powers, i.e., to Promulgate Ordinances when either of the two Houses of the Parliament is not in session,** which makes it impossible for a single House to pass and enact a law.
- These Ordinances **have the same effect as an Act of Parliament**.
- Ordinances **may relate to any subject that the Parliament has the power to make law**, and would be **having the same limitations**.
- The Ordinances **may have a retrospective effect and may modify or repeal any act** of Parliament or other ordinances. It may be **used to amend a tax law, but it can never amend the Constitution.**
- The President **may withdraw an ordinance at any time**. However, he **exercises his power with the consent of the Council of Ministers headed by the President**.
- **Following limitations exist on the Ordinance making power,**
    - **Legislature is not in session**: The President can **only promulgate** an Ordinance **when either of the two Houses of Parliament is not in session**.
    - **Immediate action is required**: The President cannot promulgate an Ordinance **unless he is satisfied that there are circumstances that require taking 'immediate action'.**
    - **Parliament should approve**: Ordinances **must be approved by Parliament within six weeks of reassembling** or they shall cease to operate. The same will **cease to operate if disapproved by either House.**
- In various judicial pronouncements, the Supreme Court has held that the **President's Ordinance making power is not beyond the scope of judicial**

review.

MNRE Unveils Guidelines for Incentive Schemes for Electrolyser & Green Hydrogen Production in India

SIGHT programme

- It is a sub component under the **National Green Hydrogen Mission.**
- **Component I:** It aims at providing **electrolyser manufacturing incentives** with a total outlay of INR 4440 crore
- **Component II:** It focuses on **green hydrogen production** with financial outlay of INR 13050 crore.
- **Implementing agency:** The **Solar Energy Corporation of India** (SECI) would be the implementing agency responsible for the scheme's execution.

National Green Hydrogen Mission

- It was launched in 2022, with the goal of making India energy independent and decarbonising major sectors of the economy.
- **Benefits of this mission**
    - India's Green Hydrogen production capacity is likely to reach at **least 5 MMT per annum**, with an associated renewable energy capacity addition of about 125 GW.
    - The targets by 2030 are likely to bring in over Rs. 8 lakh crore investments.
    - Nearly 50 MMT per annum of **CO2 emissions** are **expected to be averted** by 2030.

Green hydrogen

- It is the gas produced by **splitting water into hydrogen** and oxygen using an electrolyser that may be powered by electricity generated from renewable energy sources.

Centre's potable water mission may miss 2024 target

Jal Jeevan Mission:

- Jal Jeevan Mission (JJM) was launched in 2019 and is planned to have Functional Household Tap Connections (FHTC) installed in every rural household, supplying each household with 55 litres of water per person per day.
- It comes under the Department of Drinking Water and Sanitation, **Jal Shakti Ministry.**
- The fund ratio shared between the Centre and the State:
- for Himalayan (Uttarakhand, Himachal Pradesh) and the North-Eastern States is **90:10;**
    - for Union-Territories, it is **100:0**; and
    - For the rest of the states, it is **50:50.**
- It is mainly concentrated on areas such as **substantial information, education, and communication, focused on a community-based approach.**
- This mission will also concentrate on source sustainability measures, such as **recharge and reuse** through **greywater management, water conservation, and rainwater harvesting.**
- As per the survey reports, Only 5% of the total, about one crore households

out of nearly 19.5 crore households where work hasn't even begun, are targeted under the scheme.

- There is a system of 'certification' wherein the gram panchayats in a village which district and block level authorities report as fully connected call a quorum, and upload a video attesting to the veracity of the claim.
- There are two mechanisms for independent verification:
    - **Independent audit agency** that conducts a survey by preparing a representative sample and interviewing respondents on whether the installed water connections are actually delivering water to their satisfaction.
    - **National WASH (Water, Sanitation, and Hygiene)** experts who appraise a section of villages on the quality of services provided.
- Only 58,357 villages have been so 'certified' of the nearly 1,68,000 villages that are reported as 'Har Ghar Jal' where all houses have tap water, suggesting that the gap between reported and verified connections is wide.
- States like **Punjab (99.9%), Himachal Pradesh (97.2%),** and **Bihar (96%)** are nearing to fulfil the Har Ghar Jal motto.
- The broad objectives of the Mission are:
    - To provide FHTC to every rural household.
    - To prioritise provision of FHTCs in quality affected areas, villages in drought prone and desert areas, Sansad Adarsh Gram Yojana (SAGY) villages, etc.
    - To provide functional tap connections to Schools, Anganwadi centres, GP buildings, Health centres, wellness centres and community buildings.
    - To monitor functionality of tap connections.
    - To promote and ensure voluntary ownership among local community by way of contribution in cash, kind, and/ or labour and voluntary labour (shramdaan),
    - To assist in ensuring sustainability of water supply system, i.e., water source, water supply infrastructure, and funds for regular O&M.
    - To empower and develop human resources in the sector such that the demands of construction, plumbing, electrical, water quality management, water treatment, catchment protection, O&M, etc. are taken care of in short and long term.
    - To bring awareness to the various aspects and significance of safe drinking water and involvement of stakeholders in manner that makes water everyone's business.

Prime Minister launched the National Sickle Cell Anaemia

National Sickle Cell Anaemia Elimination Mission

- The Mission aims to address the pressing health challenges posed by sickle cell disease, particularly among the tribal population, will mark a crucial milestone in the Government's ongoing efforts to eliminate sickle cell disease as a public health problem by 2047.
- **Objectives of the Mission:**
    - Provision of affordable and accessible care to all SCD patients
    - To ensure quality of care for SCD patients

- To reduce the prevalence of SCD
- **Health promotion**Awareness generation & pre-marital genetic counselling
  - **Prevention:** Universal screening and early detection
  - **Holistic Management & continuum of care**: Management of persons with sickle cell disease at primary, secondary and tertiary health care levels; treatment facilities at tertiary health care facilities Patient support system Community adoption.

Sickle Cell disease

- Sickle cell disease is a group of inherited red blood cell disorders that affect haemoglobin, the protein that carries oxygen through the body.
- The red blood cells are disc-shaped and flexible enough to move easily through the blood vessels. If people have sickle cell disease, their red blood cells are crescent or **"sickle" shaped.**
- These cells do not bend or move easily and can block blood flow to the rest of their body leading to serious problems, including **stroke, eye problems, infections, and episodes of pain** called **pain crises**.
- As per the Census 2011, India has an **8.6% tribal population, which is 67.8** million across the Indian states.
- The MoHFW tribal health expert committee report has listed sickle cell disease as one of the 10 special problems in tribal heath that affect the tribal people disproportionately, thus making this an important intervention.
- The program will be carried out in a mission mode covering the entire population from zero to 18 years of age and shall incrementally include the entire population up to 40 years as a part of National Health Mission.
- In the initial stage, the mission would prioritise its intervention in high prevalence and tribal states/UT, the plan would subsequently expand to include all states/UTs in a phase-wise manner with an incremental approach.
- The mission aims to cover 7 crore people with screening, counselling for prevention and care for people with SCD in three and half years.

DPIIT successfully organizes National Workshop on Industrial Park Rating System

Industrial Park Rating System

- IPRS was launched **by DPIIT in 2018** with the support of the **Asian Development Bank (ADB)** and the **Ministry of Electronics and Information Technology (MeitY).**
- Industrial Park Rating System (IPRS) is an **extension of the India Industrial Land Bank (IILB)** platform which features **more than 4,500 industrial parks.**
- It is a **GIS-enabled database** to **facilitate investors to identify their preferred location for investment.**
- **Aim:** To **rate** the country's **industrial parks and special economic zones (SEZ).**
- It rates industrial parks **across four pillars**: internal infrastructure and utilities, external infrastructure and facilities, business support services, and environmental and safety management.
- Industrial Parks and Special Economic Zones (SEZS) are classified into 3 categories: **Leaders, Challengers and Aspirants.**

- This particular portal is integrated with the industry-based GIS system of the states and Union territories and plot-wise information in these are **updated on a real-time basis.**
- **Industrial Park Rating System Report 2.0**
    - Based on the findings of the pilot and review of the global approaches, frameworks, and guidelines DPIIT **introduced 'IPRS 2.0' in Oct, 2021** as a key enabler for identifying additional measures to enhance industrial competitiveness.
    - The Globally known frameworks were referred for developing the initial concept of IPRS 2.0 viz. **the International Guidelines for Industrial Park (IGIP) developed by United Nations Industrial Development Organization (UNIDO)** and **the Eco-Industrial Park (EIP) framework** developed by UNIDO, World Bank.

Special Economic Zone (SEZ)

- They are typically created in order to facilitate rapid economic growth by **leveraging tax incentives** to attract foreign investment and spark technological advancement.
- The Special Economic Zones (SEZs) policy was **launched in April, 2000.**
- SEZs being set up under **The Special Economic Zones Act, 2005.**

Nine Nano Urea plants to be set up across the country by 2025 says Union Minister Dr. Mansukh Mandaviya

- The ministry is aiming to **manufacture 44 crore bottles of Nano Urea** by the year 2025.
- To achieve the target nine plants will be set up across the country.

Nano Urea

- It is a **nanotechnology-based** revolutionary **Agri-input** that **provides nitrogen to plants.**
- It is **developed and patented** by the **Indian Farmers Fertiliser Cooperative Limited (IFFCO).**
- IFFCO Nano Urea is the **only nano fertilizer approved by the Government of India** and included in the Fertilizer Control Order (FCO).
- **Features:**
    - Compared to conventional urea prill, Nano Urea has a **desirable particle size of about 20-50 nm** and **more surface area** (10,000 times over 1 mm urea prill) **and number of particles** (55,000 nitrogen particles over 1 mm urea prill).
    - It **contains 4.0 % total nitrogen** (w/v).
- **Merits of Nano Urea:**
    - The urea **absorption rate by crops is 80 percent** in the case of Nano Urea whereas the traditional urea absorption rate is only 30 percent.
    - Nano Urea **is cost-effective** and demonstrated an **increase in crop yield.**
    - It is produced by an **energy-efficient, environment-friendly production process** with less carbon footprints.
    - It is also **easy to store than urea bags.**
- A target has been set to achieve self-reliance in the production of Urea **to reduce dependence on imports.**

Govt revises crop residue management guidelines

Crop Residue Management guidelines

- As per the revised guidelines, techno-commercial pilot projects for Paddy Straw Supply Chain will be established under the **bilateral agreement between the Beneficiary/Aggregator and Industries** utilizing the paddy straw.
- **The beneficiary or aggregator** can be **Farmers, rural entrepreneurs**, Cooperative Societies of Farmers, **Farmers Producer Organizations (FPOs) and Panchayats**.
- **The govt. shall provide** financial assistance on the **capital cost of machinery and equipment.**
- Project proposal-based **financial assistance will be extended for** machines and equipment **such as higher HP tractors, cutters, tedder**, medium to large balers, rakers, loaders, grabbers and tele-handlers.
- **State Government**s shall approve these projects through **project sanctioning committee.**
- **Funding pattern:**
    - The **Centre and state governments** will jointly provide financial **support of 65 per cent** of the project cost, while the industry as primary promoter of the project will contribute 25 per cent.
    - The **remaining 10%** will be contributed by **beneficiary or aggregator.**
- **The land for storage** of the collected paddy straw will be arranged and prepared by the beneficiary as may be guided by the end use industry.

Outcomes

- **Supplementing in-situ options:** The initiative will complement the ongoing efforts for paddy straw management through in-situ methods.
- **Reduction in stubble burning:** It is estimated that during the three-year duration of the interventions, approximately 1.5 million MT of surplus paddy straw will be collected, which would have otherwise been burnt in the fields.
- **Creation of biomass collection depots:** Around 333 biomass collection depots with a capacity of 4,500 MT will be established in the states of Punjab, Haryana, Uttar Pradesh, and Madhya Pradesh.
- **Reduced air pollution:** The project will significantly contribute to reducing air pollution caused by stubble burning, leading to cleaner and healthier environments.
- **Job creation:** The interventions are expected to generate employment opportunities for approximately 900,000 man-days.
- **Encouraging a robust supply chain:** The establishment of a paddy straw supply chain will facilitate its availability for various end-uses such as power generation, heat generation, bio-CNG, etc., by power/bio-CNG/bio-ethanol producers.
- **Stimulating investments:** The development of a supply chain will attract new investments in the biomass-to-biofuel and energy sectors.

Home Minister approves release of ₹6,194 crore disaster relief fund to 19 States

- The amount includes**1,209.60 crore** as **Central share of the State Disaster Response Fund (SDRF) to four States** (Chhattisgarh, Meghalaya, Telangana,

Uttar Pradesh) **for year 2022-23** and **Rs.4,984.80 crore** to 15 States (Andhra Pradesh, Arunachal Pradesh, Assam, Bihar etc.)
- The release of funds will help States undertake relief measures **during the current Monsoon season.**

State Disaster Response Fund
- The State Disaster Response Fund (SDRF), **constituted under Section 48 (1) (a) of the Disaster Management Act, 2005**.
- It is the **primary fund available with State Governments** for responses to notified disasters.
- **Contribution:**
  - The **Central Government contributes 75% of SDRF** allocation for **general category States/UTs** and 90% for special category States/UTs (NE States, Sikkim, Uttarakhand, Himachal Pradesh, Jammu and Kashmir).
- **Disaster (s) covered under SDRF:** Cyclone, drought, earthquake, fire, flood, tsunami, hailstorm, landslide, avalanche, cloudburst, pest attack, frost and cold waves.
- **Local Disaster:** A State Government may **use up to 10 percent of the funds** available under the SDRF for providing **immediate relief to the victims of natural disasters** that they consider to be 'disasters' within the local context in the State and which **are not included in the notified list of disasters of the Ministry of Home Affairs.**
- Based on the **15th Finance Commission recommendations**, the Central Government has allocated over **one lakh 28 thousand crore rupees for SDRF for the years 2021-22 to 2025-26.**

Delhi HC rejects PepsiCo's appeal over potato patent

Protection of Plant Varieties and Farmers' Rights Authority
- It is a **Statutory body** created by an act of Parliament.
- It **works under the Department of Agriculture**, Cooperation and Farmers Welfare, **Ministry of Agriculture and Farmers Welfare.**
- **Formation**:
  - In order to provide for the establishment of an effective system **for the protection of plant varieties, the rights of farmers and plant breeders and to encourage the development of new varieties** of plants, the **of India enacted "The Protection of Plant Varieties and Farmers' Rights (PPV&FR) Act, 2001**" adopting sui generis system.
  - The legislation re**cognizes the contributions of both commercial plant breeders and farmers in plant breeding activity** and also **provides to implement TRIPs** in a way that supports the specific socio-economic interests of all the stakeholders including private, public sectors and research institutions, as well as resource-constrained farmers.
  - **To implement the provisions** of the Act, the **established the Protection of Plant Varieties and Farmers' Rights Authority** on 11 November, 2005.
- **Structure**:
  - The **Chairperson is the Chief Executive** of the Authority.

- Besides the Chairperson, the Authority has **15 members, as notified by the Government of India (GOI).**
- **Eight of them are ex-officio members representing various Departments/ Ministries**, three from SAUs and the State Governments, **one representative each for farmers, tribal organization, seed industry and women organization associated with agricultural activities are nominated by the Central Government.**
- The R**egistrar General is the ex-officio Member Secretary** of the Authority.

- **General Functions of the Authority:**
  - **Registration of new plant varieties, essentially derived varieties (EDV)**, extant varieties;
  - **Developing DUS** (Distinctiveness, Uniformity and Stability) **test guidelines** for new plant species;
  - **Developing characterization** and documentation of varieties registered;
  - **Compulsory cataloguing facilities** for all variety of plants;
  - **Documentation, indexing and cataloguing** of farmers' varieties;
  - **Recognizing and rewarding farmers**, community of farmers, particularly tribal and rural community engaged in conservation and improvement;
  - **Preservation of plant genetic resources** of economic plants and their wild relatives;
  - **Maintenance of the National Register of Plant Varieties and**
  - **Maintenance of National Gene Bank.**

Products under One District One Product programme onboarded and tagged on Groyyo's e-commerce platform

One District One Product (ODOP) programme

- It was launched by the **Ministry of Food Processing Industries in 2018**.
- **Objective:** To help districts reach their full potential, foster economic and socio-cultural growth, and create employment opportunities, especially, in rural areas.
- This initiative aims to turn every **district in India, into an export hub** through promotion of the product in which the district specialises.
- The initiative plans to accomplish this by scaling manufacturing, supporting local businesses, finding potential foreign customers and so on, thus helping to achieve the 'Atmanirbhar Bharat' vision.
- The ODOP Initiative has identified a total of 1102 products from 761 districts across the country.
- This initiative is carried out **with the 'Districts as Exports Hub' initiative** by the Directorate General of Foreign Trade (DGFT), Department of Commerce.
- Under the ODOP initiative, all products **have been selected by States**/UTs by taking into consideration the existing ecosystem on the ground, products identified under Districts as Export Hubs (DEH), and GI-tagged products.
- The finalized list is communicated to the Department for Promotion of

Industry and Internal Trade (DPIIT) by the relevant Department of States/UTs.

ECONOMY

Big jump in ECBs signals revival of private capex

External Commercial Borrowings (ECBs)

- ECBs refer to the **borrowing of funds by Indian companies from foreign sources** in the form of **loans, bonds, or other financial instruments**.
- **Purpose**: It can be used to **finance a variety of purposes**, including the **expansion of business, the acquisition of assets, and the repayment** of existing debt.
- **Source of ECBs**: ECB can be obtained from a variety of sources, **including foreign banks, international financial institutions, and foreign subsidiaries of Indian companies**.
- ECB **can be in the form of rupee-denominated loans**, which are repaid in Indian rupees, **or foreign currency-denominated loans**, which are repaid in a foreign currency.
- **Regulation**: ECB is **subject to regulatory oversight by the** RBI, which **sets limits on the amount of ECB** that Indian companies can obtain **and the purposes for which it can be used.**
- **Companies must also meet certain eligibility criteria** in order to access ECB, such as minimum credit ratings and debt-equity ratios.
- **Benefits:**
    - ECBs provide an **opportunity to borrow large volumes of funds**.
    - The funds are **available for a relatively long term.**
    - **Interest rates are also lower** compared to domestic funds.
    - **ECBs are in the form of foreign currencies**. Hence, they **enable the corporate to have foreign currency to meet the import of machineries** etc.
- **Risks**:
    - **Exchange rate risk:** Fluctuations in the value of the Indian rupee against foreign currencies can affect the cost of repaying the loan.
    - **Sovereign risk:** ECB exposes companies to sovereign risk, as the ability of a foreign government to repay its debt can affect the creditworthiness of foreign lenders. If a foreign government defaults on its debt, it could have a negative impact on the ability of foreign lenders to repay their loans to Indian companies.
    - **Credit risk:** ECB exposes companies to credit risk, as foreign lenders may not have the same level of protection as domestic lenders in the event of default.
    - **Regulatory risk:** ECB is subject to regulatory risk, as changes to government regulations or policies related to ECB can affect the availability and cost of borrowing.

PFRDA to allow funds to invest in sovereign green bonds

- The Government of India is expected to issue sovereign green bonds in the second half of the current financial year as part of the overall market borrowing programme.

Sovereign Green Bonds

- These are bonds issued by any **sovereign entity, inter-governmental**

groups or alliances and corporates.
- **Aim:** The proceeds of the bonds are **utilised for projects** classified as **environmentally sustainable.**
- These are issued with **longer maturity period.**
- In India, the **framework for the sovereign green bond** was issued by the government on **November 9, 2022.**

PFRDA
- It is a **statutory regulatory body** set up under PFRDA Act **enacted in 2014.**
- **Objective:** To promote old age income security by establishing, developing, and regulating pension funds and to protect the interests of subscribers to schemes of pension funds and related matters.
- **Composition:** It consists of a **Chairperson and not more than six members**, of whom at least three shall be Whole-Time Members, to be appointed by the Central Government.
- **Nodal Ministry:** Ministry of Finance.
- **Headquarters:** New Delhi
- **Functions:**
    - **Regulate National Pension System** (NPS) and other pension schemes to which PFRDA Act applies.
    - Establish, develop and regulate pension funds.
    - Protect the interest of pension fund subscribers.
    - Register and regulate intermediaries.
    - Laying down norms for **management of corpus of pension funds**.
    - Establish grievance redressal mechanism for subscribers.
    - Settle disputes among intermediaries and also between intermediaries and subscribers.

Arhtiyas oppose apple sale by weight, threaten stir from today

Arhtiyas
- "Arhtiyas" refers to **commission agents or middlemen in the agricultural sector.**
- **Primary Functions**:
    - **Procurement**: Arhtiyas **procure agricultural produce from farmers either directly** from the **farm or at local agricultural markets (mandis).**
    - **Financial Services:** They often **provide credit to farmers** to meet their immediate financial needs, including inputs for the next cropping season or personal expenses.
    - **Storage:** Arhtiyas may **offer warehousing facilities** for the storage of agricultural commodities.
    - **Marketing:** They **facilitate the sale of agricultural produce to wholesale buyers**, such as government agencies or private traders, on behalf of the farmers.
- **Commission**: Arhtiyas **charge a commission for their services,** usually a **percentage of the transaction valu** The commission rates can **vary depending on the region, crop, and prevailing market conditions.**
- They play a **significant role in the traditional agricultural marketing system**, particularly in states like Punjab, Haryana, and Uttar Pradesh.

- Arhtiyas are an **integral part of the Agricultural Produce Market Committee (APMC)** system in India.

OECD wants data sharing on foreign real estate deals

Organisation for Economic Co-operation and Development (OECD)

- It is an **international organisation of 38 countries committed to democracy and the market economy.**
- OECD **members are typically democratic countries that support free-market economies**.
- The OECD was **established on Dec. 14, 1960, by 18 European nations**, **plus the United States and Canada.**
- **Headquarters: Paris, France.**
- **Goal: The stated goal**of the OECD is **to shape policies that foster prosperity, equality, opportunity and well-being for all.**
- The OECD **publishes economic reports, statistical databases**, analyses, and forecasts on the outlook for economic growth worldwide.
- The organization also **seeks to eliminate bribery and other financial crime worldwide**.
- The OECD **maintains a so-called "black list" of nations that are considered uncooperative tax havens.**
- **India is one of the many non-member economies with which the OECD has working relationships** in addition to its member countries.

Banks seek clarity on move to new provisioning regime

Loan-loss provision

- The **RBI defines** a loan loss provision as an **expense that banks set aside for defaulted loans.**
- Banks **set aside a portion of the expected loan repayments from all loans** in their portfolio **to cover the losses either completely or partially**.
- **In the event of a loss**, instead of taking a loss in its cash flows, the bank **can use its loan loss reserves to cover the loss.**
- **The level of** loan loss provision is **determined based on the level expected to protect the safety** and soundness **of the bank**.
- The Reserve Bank of India (**RBI) recently proposed to move the banking system to an expected credit loss-based provisioning approach from an "incurred loss" approach.**

Expected Credit Loss (ECL) regime

- Under this practice, a **bank is required to estimate expected credit losses based on forward-looking estimations** rather than wait for credit losses to be actually incurred **before making corresponding loss provisions.**
- As per the proposed framework, **banks will need to classify financial assets (primarily loans) as Stage 1, 2, or 3, depending on their credit risk profile**, with **Stage 2 and 3 loans having higher provisions** based on the historical credit loss patterns observed by banks.
- Thus, through ECL, b**anks can estimate the forward-looking probability of default for each loan, and then by multiplying that probability by the likely loss given default**, the **bank gets the percentage loss that is expected to occur if the borrower defaults**.

- This will be in **contrast to the existing approach of incurred loss** provisioning, **whereby step-up provisions are made based on the time the account has remained in the Non-Performing Asser (NPA)** category.
- **Benefits of the ECL regime:**
- It will **result in excess provisions as compared to a shortfall in provisions**, as seen in the incurred loss approach.
- It will **further enhance the resilience of the banking system**in line with globally accepted norms.

What is the problem with the incurred loss-based approach?

- It **requires banks to provide for losses that have already occurred or been incurred**.
- The **delay in recognizing loan losses** r**esulted in banks having to make higher levels of provisions** which affected the bank's capital. This **affected banks' resilience** and posed systemic risks.
- The **delays in recognizing loan losses overstated the income** generated by the banks, which, **coupled with dividend payouts, impacted their capital base.**

ONDC launches academy to provide info to sellers, network participants on e-ecommerce

ONDC Academy

- It is an **initiative of Department for Promotion of Industry and Internal Trade** (DPIIT) initiative to create a facilitative model to help small retailers take advantage of digital commerce.
- It was launched **by ONDC in collaboration with NSE Academy Ltd**, a subsidiary of the National Stock Exchange.
- It **is not an application, platform, intermediary, or software** but a set of specifications designed to foster open, unbundled, and interoperable open networks.
- **Benefits**
    - The academy is a **repository of educational and informative textual** and video content programmes in multiple Indian languages.
    - It will provide a curated learning experience providing guidance and best practices for a successful e-commerce journey.
    - Anyone without any **knowledge of e-commerce** can learn how to make a seller app with a technology service provider to aggregate all sellers from a nearby marketplace to make these products available online.
    - It would also enable **certification issued by NSE Academy** to individuals completing an assessment developed by the institute.

ONDC

- It is a Section 8 company, under the initiative of DPIIT with a mission to democratize digital commerce.
- It develops and maintains the ONDC Protocol, an open technical standard similar to UPI, HTTP and SMTP.
- It **comprises of buyer-side apps where consumers can place orders**, seller-side apps that on board merchants and display their listings, and logistics platforms that handle deliveries.

Agriculture insurance premium has been going up while claims payment is down under the Pradhan Mantri Fasal Bima Yojana.

Pradhan Mantri Fasal Bima Yojana

- It was **launched in 2016 and replaced all the prevailing yield insurance schemes** in India.
- This scheme is **being administered by the Department of Agriculture**, Cooperation and Farmers' Welfare **under the Ministry of Agriculture**, **along with empanelled general insurance companies.**
- **Aim**: To support production in agriculture by **providing affordable crop insurance to ensure comprehensive risk cover for crops** of farmers a**gainst all non-preventable natural risks**.
- The scheme **provides coverage for the entire cropping cycle, from pre-sowing to post-harvest and midseason adversities.**
- **Objectives**:
    - Providing **financial support to farmers suffering crop loss**/damage arising **out of unforeseen events;**
    - **Stabilizing the income of farmers** to ensure their continuance in farming;
    - Encouraging farmers to **adopt innovative and modern agricultural practices**;
    - **Ensuring flow of credit** to the agriculture sector, which will contribute to food security, **crop diversification** and enhancing growth and competitiveness of the agriculture sector besides **protecting farmers from production risks;**
- **Eligibility criteria**:
    - The scheme is **compulsory for loanee farmers availing Crop Loan /KCC account for notified crops.**
    - The Scheme would be **optional for non-loanee farmers.**
- **Insurance Coverage:**
    - Under this scheme, the insurance cover is **limited to specific crops and agricultural risks related to crop yield.**
    - The list of notified crops **includes food crops (i.e., cereals, millets, and pulses), oilseeds, annual commercial crops, and annual horticultural crops.**
- **General Exclusions: Losses arising out of war and nuclear risks, malicious damage** and **other preventable risks** shall be excluded.
- **Premiums**:
    - There will be a **uniform premium of only 2%** to be paid by farmers **for all Kharif crops and 1.5% for all Rabi crops.**
    - In the case of **annual commercial and horticultural crops**, the premium to be paid by farmers **will be only 5%.**
    - **95-98.5% actuarial premium is fulfilled by the state and central governments** and shared on a 1:1 ratio.

US Fed Raises Interest Rates Citing Inflation, Stands At 5.25%

US Federal Reserve

- The United States Federal Reserve, commonly referred to as the **Federal Reserve or simply the Fed**, is the **central banking system of the United**

States.

- It provides the country with a safe, flexible, and stable monetary and financial system.
- The Federal Reserve System is **composed of 12 regional Federal Reserve Banks** that are each responsible **for a specific geographic area of the U.S**.
- The Fed's main **duties include conducting national monetary policy, supervising** and **regulating banks, maintaining financial stability, and providing banking services**.

Impacts of US Federal Reserve Interest Hike:

- The US Fed is the **world's most powerful central bank.**
- **When the Fed adjusts interest rates**, the **effects are felt worldwide,** influencing both developed and emerging economies.
- Conventional wisdom suggests that **higher interest rates in the US would make American assets more appealing to investors**, potentially **leading to capital outflows from emerging and riskier markets.**
- In such a scenario, **capital-intensive sectors**, **which heavily rely on Foreign Direct Investments (FDIs), could be the first to feel the impact.**
- Higher US interest rates could **lead to a tightening of global liquidity**, **making borrowing more expensive for foreign investors.**
- **Possible impacts on the Indian Economy:**
    - After a rate hike by the US Fed, the **difference between interest rates in US and India shrinks,** which **affects the currency trade negatively.**
    - **Foreign investors** will be tempted to **withdraw from the Indian market and invest in US assets,** as the Dollar and the US Treasury yield become more attractive in the US and the **Indian market begins to see capital outflow.**
    - Thus, an **interest rate hike in the US increases the relative returns on dollar investments, leading the US currency to strengthen.**
    - This **makes the rupee weaker,** and it **prompts RBI for a rate hike in India.**
    - So, when the US Fed increases rates, **RBI also has to increase interest rates here in India so that the outflows of funds from the FIIs** (Foreign Institutional Investors) **can be curtailed** to save guard the rupee.
    - **If the rupee falls significantly, the RBI may be forced to sell some dollars** to help shore up the domestic currency. **This depletes the domestic Forex reserve**.

Govt. may extend PLI scheme to chemicals, petrochemicals sectors

Finance Minister said the government is open to introducing a production-linked incentive (PLI) scheme for investments in the chemicals and petrochemicals sectors.

Production Linked Incentive (PLI) Schemes

- The Production Linked Incentive (PLI) schemes are a **set of initiatives launched by the Government of India to boost domestic manufacturing and exports in various sectors.**
- The schemes aim to provide financial incentives to eligible manufacturers based on their incremental production and sales over a base year.

- The schemes also seek to attract foreign direct investment (FDI) and enhance the competitiveness of Indian products in the global market.

Background

- The PLI schemes were **first announced in April 2020 as part of the Atmanirbhar Bharat Abhiyan (Self-Reliant India Movement), a comprehensive economic package to revive the economy amid the COVID-19 pandemic.**
- The schemes were initially introduced for three sectors: mobile phones and specified electronic components, active pharmaceutical ingredients (APIs) and medical devices, critical key starting materials (KSMs), drug intermediates and APIs. Later, the schemes were extended to more sectors.
- Currently, the schemes offer incentives to companies for incremental sales of products manufactured in India across 14 key sectors, such as electronics, pharmaceuticals, automobiles, textiles, and food products.

The PLI schemes have several features that make them different from the previous incentive schemes. Some of these features are:

Output-oriented

- The schemes are output-oriented rather than input-based. They reward manufacturers for increasing their production and sales rather than for investing in capital or infrastructure.

Time-bound

- The schemes are time-bound and have a sunset clause. They are valid for a period of five to six years depending on the sector.

Performance-based

- The schemes are performance-based and have a graded incentive structure. The incentive rate varies according to the category of the manufacturer (domestic or foreign), the level of value addition, the type of product and the year of operation.

Flexible

- The schemes are flexible and allow manufacturers to choose their own base year, investment plan and production targets within the prescribed guidelines.

Aligned with the national priorities

- The schemes are aligned with the national priorities and strategic sectors. They aim to reduce import dependence, promote innovation and R&D, create employment opportunities and enhance India's share in the global value chain.

Significances

Boost Manufacturing

- The schemes can boost India's manufacturing output and exports by creating a conducive environment for domestic and foreign investors.
- According to government estimates, the PLI schemes can generate additional production worth Rs 37.5 lakh crore ($500 billion) and additional exports worth Rs 20 lakh crore ($267 billion) over five years.

Enhance self-reliance and resilience

- The schemes can enhance India's self-reliance and resilience in critical sectors such as electronics, pharmaceuticals, telecom and renewable energy. These sectors have high import dependence and strategic importance for

India's development and security.

Foster innovation

- The schemes can foster innovation and R&D in emerging technologies such as electric vehicles, 5G, artificial intelligence and biotechnology. These technologies have immense potential for transforming various sectors and improving the quality of life of people.

Employment opportunities

- The schemes can create employment opportunities for millions of people across various skill levels. According to government estimates, the PLI schemes can create direct employment for 1.8 million people and indirect employment for several more over five years.

The PLI schemes also face some challenges and limitations that need to be addressed for their effective implementation and impact. Some of these challenges are:

Monitoring and evaluation mechanism

- The schemes require a robust monitoring and evaluation mechanism to ensure transparency, accountability and compliance of the manufacturers.
- The government needs to establish clear criteria and indicators for measuring the incremental production, sales and value addition of the manufacturers and verify them through independent audits.

Coordinated approach

- The schemes require a coordinated approach among various ministries, departments, agencies and stakeholders to avoid duplication, overlap or conflict of policies and regulations.
- The government needs to harmonize the PLI schemes with other existing or proposed schemes such as Make in India, Digital India, Startup India, etc.

Supportive ecosystem

- The schemes require a supportive ecosystem of infrastructure, logistics, finance, skilling and market access to enable the manufacturers to scale up their production and exports. The government needs to address the bottlenecks and gaps in these areas through reforms and investments.

Gig workers demand model law, labour rights, social security

The National Coordination Committee on Gig Workers (NCCGW), an umbrella organisation of several unions working among gig and platform workers, protested in front of Parliament and demanded the Centre for a model law for the sector so that these workers get social and job security.

Gig workers

- Non-standard or gig work consists of **income-earning activities outside of standard, long-term employer-employee relationships.**
- A gig economy is a labor market that relies **heavily on temporary and part-time positions** filled by **independent contractors and freelancers** rather than full-time permanent employees.
- The term is borrowed from the music world, where performers book "**gigs**" that are **single or short-term engagements** at various venues.
- The gig economy uses **digital platforms** to connect freelancers with customers to provide **short-term services or asset-sharing**.
- Examples include **ride-hailing apps, food delivery apps, and holiday rental apps.**

Rise in Gig Workers

- **Post Pandemic:** The trend accelerated during the 2020 COVID-19 pandemic, the gig economy experienced significant increases as gig workers delivered necessities to **home-bound consumers,** and those whose **jobs had been eliminated turned to part-time and contract work for income.**
- **Freedom to work from anywhere:** These types of positions facilitate independent contracting work, with many of them not requiring a freelancer to come into an office.
- **Wide Range of Applicants:** Employers also have a wider range of applicants to choose from because they don't have to hire someone based on their proximity.
- **Rise of Technology and Internet:** Rise of fast internet and smartphones have made it easier to work from anywhere easily.
- **Convenient for Small Organisations:** Employers who cannot afford to hire full-time employees to do all the work will often hire part-time or temporary employees to take care of busier times or specific projects.
- **More income with more work:** People often find they need to move or take multiple positions to afford the lifestyle they want. It's also common to change careers many times throughout a lifetime, so the gig economy can be viewed as a reflection of this occurring on a large scale.
- **Benefits Employers:** Employers do not need to provide related benefits, such as medical insurance, Provident Fund, and year-end bonuses which make it a better option for them to pay only for work on a unit basis.
- **Work for All:** Students can choose lower-skilled jobs and work without academic or professional qualifications. Retirees, housewives, etc. may find it difficult to find part-time jobs on weekdays, but now they can make good use of their spare time to earn extra money.

India and Gig Economy

- In 2020, 7.7 million workers were engaged in the gig economy.
- The gig workforce is expected to expand to 23.5 million workers by 2029-30.
- At present about 47% of the gig work is in medium skilled jobs, about 22% in high skilled, and about 31% in low skilled jobs.
- Trend shows the concentration of workers in medium skills is gradually declining and that of the low skilled and high skilled is increasing.
- It may be expected that while the domination of medium skills would continue till 2030, gig work with other skills will emerge.

Steps Taken by Government of India for Gig Workers

- **Code of Social Security, 2020:** The Government has formulated the Code on Social Security, 2020 which envisages framing of **suitable social security schemes for gig workers and platform workers** on matters relating to life and disability cover, accident insurance, health and maternity benefits, old age protection, etc. However, these provisions under the Code have not come into force.
    - **Platform workers** are those whose work is based on **online software apps or digital platforms. Non-platform gig workers** are generally **casual wage workers and own-account workers** in the conventional sectors, working part-time or full time.
- **e-Shram Portal:** The Government has also launched e-Shram portal in 2021

for registration and creation of a **Comprehensive National Database of Unorganized Workers including gig workers and platform workers.**
  - It allows a person to register himself or herself on the portal on a self-declaration basis, which is spread across around 400 occupations.

Govt. allows Indian companies to list on foreign exchanges through IFSC

Corporate Debt Market Development Fund

- It is a **backstop facility for specified debt funds** during market dislocations.
- The fund is intended to **provide liquidity support** in the event of a financial crisis.
- It will be in the form of an alternative investment fund (AIF), meant to instil confidence among the participants in the Corporate Bond Market during times of stress
- The fund has **Rs 33,000-crore backstop facility** for Mutual Funds.
- Of the Rs 33,000 crore, Rs 30,000 crore will come from the government, while the balance **Rs 3,000 crore** will be contributed **by the Asset Management Companies.**
- Contributions to the fund can be done by the **specified debt-oriented mutual fund** schemes and **asset management companies** of mutual funds.
- This fund is guaranteed by the **National Credit Guarantee Trust Company (NCGTC**) and the backstop facility **will be managed by SBI Mutual Fund.**
- **Who can invest?**
  - Specified **debt-oriented mutual fund schemes** here are 'open-ended debt oriented mutual fund schemes, excluding the overnight funds and gilt funds and including conservative hybrid fund'.
  - These specified debt-oriented **schemes will invest 25 basis points** (0.25 per cent) of their **asset under management** (AUM) in CDMDF units and will increase their contribution when their AUM increases and review it every six months.
  - However, there will be no redemption from CDMDF in case their AUM reduces.
  - The same applies to the specified schemes of new mutual funds or such new schemes from the existing mutual funds.
  - The AMCs are also required to **make a contribution of 2 per cent of** their specified debt-oriented schemes' AUM as a one-time contribution.
  - The initial contribution for this purpose will be based on the AUM as of December 31, 2022, in the specified schemes of the mutual funds.

Backstop facility

- A backstop is an **act of providing last-resort support or security** in a securities offering for the unsubscribed portion of shares.
- When a company is trying to raise capital through an issuance, it may get a backstop **from an underwriter or a major shareholder, such as an investment bank**, to buy any of its unsubscribed shares.

Digital Payments Rise 13 Percent Yoy At March-end: RBI Data

Digital Payment Index

- It has been **constructed by the RBI** to measure the extent of digitisation of payments across the country.

- It is based on multiple parameters and reflects the expansion of **various digital payment modes accurately.**
- It is a first-of-its kind index to measure the spread of digital payments across the country.
- It **contains five broad parameters** that measure the deepening and penetration of digital payments in the country over different time periods.
    - **Payment Enablers** with a weight of 25% (Internet, mobile, Aadhaar, bank accounts, participants, merchants)
    - **Payment Infrastructure – Demand-side factors** weight 10% (Debit and credit cards, PPIs, Customers registered in mobile and internet banking, FASTags),
    - **Payment Infrastructure – Supply-side factors** weight 15% (Bank branches, BCs, ATMs, PoS Terminals, QR Codes, Intermediaries),
    - **Payment Performance** – weight 45% (Digital payment volumes, value, unique users, paper clearing, currency in circulation, cash withdrawals) and
    - **Consumer Centricity weight** – 5% (awareness and education, declines, complaints, frauds, system downtime).
- The **base period** of the index is **March 2018.**
- The index has been published **on a semi-annual basis** from March 2021 onwards with a lag of 4 months.

Sebi trashes reports of plans to curb retail participation in derivatives segment

Derivatives

- A derivative is a **contract between two parties** which **derives its value/price from an underlying asset.**
- The **commonly used assets are stocks, bonds, currencies, commodities** and market indices.
- These instruments **allow investors and traders to speculate on the price movements of the underlying asset without owning it directly.**
- The value of the underlying assets keeps changing according to market conditions. The basic principle behind entering into derivative contracts is to **earn profits by speculating on the value of the underlying asset in future.**
- Derivatives **serve various purposes, including hedging against risks, providing leverage, and facilitating price discovery.**
- The **most common types of derivatives are:**
    - **Futures Contracts:** A futures contract is an **agreement between two parties to buy or sell an asset at a predetermined price on a specific future date.** The underlying asset can be commodities, financial instruments, or indices.
    - **Options Contracts**: An options contract g**ives the holder the right, but not the obligation, to buy (call option) or sell (put option) an underlying asset** at a specified price (strike price) on or before a predetermined expiration date.
    - **Swaps**: Swaps are agreements between two parties **to exchange cash flows based on specific financial variables.** C**ommon types of swaps include interest rate swaps, currency swaps,** and commodity swaps.

Swaps are often used to manage interest rate risks, currency risks, or to change the nature of a debt obligation.
    - **Forwards**: Forwards are **similar to futures contracts but are not standardized or traded on exchanges.** They are customized agreements between two parties to buy or sell an asset at a specified price on a future date

India's forex reserves fall by $1.9 billion to $607.03 billion

Foreign Exchange Reserves

- Foreign Exchange Reserves (also called F**orex Reserves**) are **reserve assets held by a central bank in foreign currencies.**
- These may **include foreign currencies, bonds, treasury bills, and other government securities.**
- Reserves are **denominated and expressed in the US dollar**, which is the international numeraire for the purpose.
- **RBI is the custodian** of the Foreign exchange reserves in India.
- **India's foreign exchange reserves comprise** of;
    - **Foreign currency assets (FCAs):** These are maintained in currencies like the US dollar, euro, pound sterling, Australian dollar and Japanese yen.
    - **Gold**
    - **SDR** (**Special Drawing Rights)**: This is the **reserve currency with IMF.**
    - **RTP** (Reserve Tranche Position): This is the **reserve capital with IMF.**
- The **biggest contributor** to India's Forex reserves **is foreign currency assets, followed by gold.**
- **Purpose**:
    - They are **used to back liabilities on their own issued currency**, **support the exchange rate** and **set monetary policy.**
    - To ensure that **RBI has backup funds if their national currency rapidly devalues** or becomes altogether insolvent.
    - **If the value of the Rupee decreases** due to an increase in the demand of the foreign currency, then **RBI sells the dollar** in the Indian money market s**o that depreciation of the Indian currency can be checked.**
    - **A country with a good stock of forex has a good image at the international level** because the trading countries can be sure about their payments.
    - A **good forex reserve helps in attracting foreign trade** and earns a good reputation with trading partners.

Traders' body announces National Digital Nagrik Forum

National Digital Nagrik Forum

- It is an **online platform** that aims t**o advance the rights of traders and consumers** and other sections of society, and **shape policy to boost the digital trade economy.**
- The forum a**ims to raise awareness about digital regulations** and h**elp build the capacities of citizens** to engage with innovation via **expert**

sessions and instructional materials.

- **Objective**: To **shape policy discourse around digital economy trade in India** with a view to c**ontributing to the Government of India's vision of creating a trillion-dollar digital economy** while maintaining an open, safe, trusted and accountable internet ecosystem.
- It will c**onduct awareness camps, digital and physical dialogues and trainings**, as well as targeted outreach to stakeholders from government, private sector and civil society,
- It will focus on **five core themes.**
    - **The first pillar** consists of c**onsumer protection and online safety** with a core focus on **efficient grievance redressal.**
    - The **pitfalls of digital cartelisation** and **how a level-playing field is necessary to discourage discriminatory and anti-competitive practices** in the online world are part of the **second pillar.**
    - **Third**, the p**otential of Indian digital technologies to not only transform retail and industrial trade** but also **boost employment** and expand the investment footprint.
    - **Fourth**, a **first principles-based taxation policy** that encourages certainty and productivity, especially for sectors with high growth potential, while p**reventing illegal activities such as tax evasion and money laundering.**
    - **Finally**, the forum will s**tudy emerging technologies,** such as blockchain and artificial intelligence, **to assess their impact on retail trade** and, at the same time, **safeguard consumers' interests.**

Worldcoin | What is Sam Altman's biometric project, and how does it work in India?

Worldcoin Project

- It is an initiative to **create a digital network** in which **everyone can claim** some kind of stake, and join the digital economy.
- This venture runs on a simple model: allow **your eyes to be scanned** in order to prove your human uniqueness, and **receive some crypto and an ID** (called a World ID) in exchange.
- Using a **device called "Orb,"** Worldcoin volunteers known as 'Orb operators' scan a person's iris pattern to collect their biometric data and help them get a World ID through the World app.
- With the app, scanned participants can collect a cryptocurrency called Worldcoin [WLD] at **regular intervals or make transactions** with their World ID where possible.
- This process is called "**proof of personhood"** and makes sure that people do not sign themselves up multiple times in exchange for crypto.
- Worldcoin claims it is building the "world's largest identity and financial public network" open to people worldwide.
- Worldcoin lists 18 locations — **largely in Delhi, Noida, and Bangalore** — where Orb operators are scanning people's eyes.

Greedflation and its counter arguments: how consumers ultimately decide prices

(Many economists have questioned the validity of the argument that corporate thirst for higher profits is the cause behind inflation)

- Greedflation refers to price inflation caused by corporate greed for high profits. Progressives in the United States have accused corporate greed as a major reason for the historically high price inflation in the U.S. since the pandemic.
- The proponents of the idea of greedflation argue that corporate profit margins have risen significantly since the pandemic even though the larger economy has struggled and that this has contributed to high inflation.
- They contend that the U.S. corporations have allegedly increased the prices of their goods by more than what was necessary to compensate for higher input costs caused by supply-chain bottlenecks.
- Proponents of the greedflation theory of inflation see this as a sign of increased market dominance by corporations, and have called for efforts to rein in market power of large corporations and some have even advocated for a ban on price hikes to prevent "profiteering".
- Greedflation has been compared to other theories of **"cost-push" inflation** which attribute inflation to a rise in input costs. In the case of greedflation, it is the rise in the corporate thirst for profits that is seen as a cost that is driving up prices.

Why area under maize has hit a plateau in Punjab, and why it is critical that it expands quickly

The sowing of kharif maize is currently ongoing in Punjab, but no major increase is expected in the area under the crop. Efforts by state governments over the past decade to increase the area under kharif maize have produced no noteworthy results. This raises some questions — including whether the possibility of expanding the cultivation of kharif maize still exists.

Maize

- The predominant maize growing states that contributes more than 80 % of the total maize production are:

Andhra Pradesh (20.9 %) > Karnataka (16.5 %) > Rajasthan (9.9 %) > Maharashtra (9.1 %) > Bihar (8.9 %) > Uttar Pradesh (6.1 %) > Madhya Pradesh (5.7 %) > Himachal Pradesh (4.4 %)

- **Temperature:** Between 21-27°C
- **Rainfall:** High rainfall.
- **Soil Type:** Old alluvial soil.
- Maize is used both as **food and fodder.**
- The **United States of America (USA) is the largest producer of maize** contributes nearly 36% of the total production in the world.
- India is the **seventh largest producer of Maize** representing around 4% of world maize area and 2% of total production.

What is GIFT NIFTY, which started trading from July 3?

GIFT NIFTY is the first cross-border initiative in connecting India and Singapore's capital markets.

- This is the **first cross-border initiative that connects the two financial hubs and offers investors access to both markets.** The deal between

Singapore Exchange (SGX) and National Stock Exchange (NSE) is based on a five-year agreement that splits the revenue from the product depending on the source of business.

- **For transactions originating from Singapore**, SGX will receive 75% of the revenue, while NSE will get 25% cent.
- **For transactions originating from the International Financial Service Centre (IFSC) at GIFT City**, NSE will retain 75% of the revenue, while SGX will get 25%. Once a certain volume threshold is reached, the revenue sharing will become 50:50 for both parties.

GIFT NIFTY

- GIFT NIFTY is the first cross-border initiative in connecting India and Singapore's capital markets. It is a new product that allows investors to trade futures and options contracts on the NIFTY 50 Index, which is the benchmark index of the National Stock Exchange of India (NSE), on the Singapore Exchange (SGX).
- The **GIFT NIFTY stands for Gujarat International Finance Tec-City (GIFT) NIFTY, as the contracts are cleared and settled at the International Financial Services Centre (IFSC) in GIFT City**, Gujarat, India.
    - The IFSC is a special economic zone that offers various incentives and benefits to participants, such as lower taxes, relaxed regulations, and access to global markets.
- It is supported by the regulatory authorities of both countries, namely the Securities and Exchange Board of India (SEBI) and the Monetary Authority of Singapore (MAS).
- The GIFT NIFTY started trading on July 3, 2023 and has received positive feedback from market participants.

Objectives

- To provide more opportunities and flexibility for investors who want to gain exposure to the Indian equity market, which is one of the fastest-growing and most dynamic markets in the world.
- Enhances the liquidity and depth of the NIFTY 50 Index, which reflects the performance of the 50 largest and most liquid companies listed on the NSE.

GIFT CITY

●It is a planned smart city that will offer state-of-the-art facilities and services for various financial activities, such as banking, insurance, asset management, capital markets, and fintech.

●The city will also have high-speed connectivity, a green and sustainable environment, and a vibrant social and cultural life.

●The city will also provide employment opportunities for the local population and boost the economic growth of the region.

GIFT NIFTY offers several advantages to investors

Longer trading hours

- The GIFT NIFTY contracts are available for trading from 9:00 am to 11:55 pm Singapore time (6:30 am to 9:25 pm India time), which covers both the Indian and Singapore market hours, as well as some of the European and US market hours.

Lower costs

- The GIFT NIFTY contracts are denominated in US dollars, which reduces the

currency risk and conversion costs for international investors. The GIFT NIFTY contracts also have lower transaction fees and margin requirements than the existing NIFTY 50 contracts traded on the NSE.

Higher leverage

- The GIFT NIFTY contracts have a smaller contract size than the existing NIFTY 50 contracts traded on the NSE, which allows investors to trade with higher leverage and lower capital outlay.

Greater diversification

- The GIFT NIFTY contracts enable investors to diversify their portfolios across different markets and asset classes, as well as hedge their exposure to the Indian equity market.

India and Asean top recipients of FDI, says UNCTAD report

- India and ASEAN were the most buoyant recipients of the Foreign direct investment (FDI), with increases of 10 and 5%, respectively.
- **FDI inflows were higher in developing countries** compared with those in developed economies.
- China, the second largest FDI host country in the world, saw a 5% increase.
- FDI in the **Gulf region declined**, but the number of project announcements increased by two thirds.
- Inflows in many **smaller developing countries were stagnant**, and FDI to the least developed countries (LDCs) declined.
- Much of the growth in international investment in **renewable energy** has been **concentrated in developed countries**.
- The **investment gap** across all sectors of the **Sustainable Development Goals has increased** to more than $4 trillion per year from $2.5 trillion in 2015.
- The largest gaps are in energy, water and transport infrastructure.

United Nations Conference on Trade and Development

- It is a permanent **inter-governmental body** established by the United Nations General Assembly in 1964.
- It is responsible for dealing with development issues, particularly international trade.
- Framing policies in various domains such as trade, technology, finance, aid, and transport are the most important priorities of UNCTAD.
- The Conference ordinarily **meets once in four years.**
- The second UNCTAD Conference took place in New Delhi, India in 1968.
- **Members:** 195 countries
- **Headquarters:** Geneva, Switzerland
- **Reports published by the UNCTAD:** Trade and Development Report, The Least Developed Countries Report and Commodities and Development Report etc.

GST Council to discuss scope of budgetary support for units in hilly states

Goods and Services Tax (GST)

- It is an **indirect tax** (not directly paid by customers to the government), that **came into effect from 1 July 2017 through** the implementation of the **101st Amendment to the Constitution** of India by the Indian government.

- It has actually **replaced various indirect taxes** such as - service taxes, VAT, excise and others in the country.
- **It is levied on the manufacturer or seller of goods and the providers of services.**
- **Types of GST:** State Goods and Services Tax (SGST), Central Goods and Services Tax (**CGST**) and the Integrated Goods and Services Tax (**IGST**, on exports and imports).

GST Council

- **Article 279A** of the Indian Constitution g**ives power to the President of India to constitute a joint forum of the Centre and States called the GST Council**, consisting of the -
  - **Union Finance Minister - Chairperson**
  - T**he Union Minister of State, in-charge of Revenue of finance - Membe**r
  - The **Minister in-charge of finance or taxatio**n or any other Minister **nominated by each State Government - Members**
- The GST Council is an a**pex committee to modify, reconcile or to make recommendations to the Union and the States on GST**, like the goods and services that may be subjected or exempted from GST, model GST laws, etc.
- **Decisions in the GST Council are taken by a majority of not less than three-fourth of weighted votes cast.**
- **Centre has one-third weightage of the total votes cast and all the states taken together have two-third of weightage** of the total votes cast.
- **All decisions taken by the GST Council have been arrived at through consensus.**

Peru Declares Emergency as Ubinas Volcano Spews Ash

Ubinas Volcano

- Ubinas is a **stratovolcano** located in the Ce**ntral Volcanic Zone of the Andes**.
- It is one of the m**ost active volcanoes in Peru**, with more than 26 eruptive episodes recorded in the last 500 years.
- The Ubinas volcano is **part of a group of seven volcanoes in southern Peru** located within a volcanic zone that extends from southern Peru to northern Chile.
- The affected area is situated w**ithin the "Ring of Fire**," a region encompassing the edges of the Pacific Ocean that is renowned for its volcanic activity and seismic events, such as earthquakes.
- The **upper portion of the volcano is made from lava flows** from the Pleistocene.
- The d**epression (caldera) at the summit contains a cone of volcanic ash sporting a vent shaped like a funnel.**

Stratovolcano

- The stratovolcano is a **tall, steep, and cone-shaped type of volcano.**
- Unlike flat shield volcanoes like in Hawaii, t**hey have higher peaks.** At the peak, **stratovolcanoes usually have a small crater.**
- Stratovolcanoes b**uild up on height by layering lava, ash and tephra.** By definition, they have alternating layers of pyroclastic and lava.

- When **ash falls or lava flows, it solidifies and makes a narrower cone.**
- Strato Volcanoes comprise the **largest percentage (~60%) of the Earth's individual volcanoes.**
- Strato volcanoes are **usually about half-half lava and pyroclastic material**, and the layering of these products gives them their other common name of composite volcanoes.

After BPCL, IOC Announces Rights Issue

Rights Issue

- A rights issue is an i**nvitation to existing shareholders to purchase additional new shares in the company.**
- This type of issue **gives existing shareholders securities called rights.**
- With the rights, the **shareholder can purchase new shares at a discount to the market price on a stated future date.**
- The company is giving **shareholders a chance to increase their exposure to the stock at a discount price.**
- Until the date at which the new shares can be purchased, s**hareholders may trade the rights on the market the same way that they would trade ordinary shares.**
- The ri**ghts issued to a shareholder have value**, thus compensating current shareholders for the future dilution of their existing shares' value.
- Dilution occurs because a right offering spreads a company's net profit over a larger number of shares. Thus, the company's earnings per share, or EPS, decreases as the allocated earnings result in share dilution.
- **Rights Offering**
    - Companies most commonly issue a right offering t**o raise additional capital**.
    - A company m**ay need extra capital** to meet its current financial obligations.
    - Troubled companies typically **use rights issues to pay down debt,** especially when they are unable to borrow more money.

India rises in digital and sustainable trade facilitation rankings, scores 100% on transparency: Fin Min

- It is conducted **every two years by UNESCAP.**
- The 2023 survey covered more than 140 economies and evaluated 60 trade facilitation measures
- It has recognized India's exceptional progress across various sub indicators, with the country achieving a perfect score of 100% in **four key areas: Transparency, Formalities, Institutional Arrangement and Cooperation, and Paperless Trade.**
- India has witnessed a substantial improvement in the score for "Women in Trade Facilitation" component from 66.7% in 2021 to 77.8% in 2023.
- India is now the best performing country amongst all the countries of South Asia region.
- The overall score of India has been greater than many developed countries including Canada, France, UK, Germany etc.

UNESCAP

- It is the most inclusive intergovernmental platform in the Asia-Pacific region which was established in 1947.
- **Member countries:** It consists of 53 members and 9 associate members.
- India is also a member of this organization.
- **Headquarters:**Bangkok, Thailand
- It works to overcome some of the region's greatest challenges by providing results-oriented projects, technical assistance, and capacity building to member States

GSTN launches geocoding in all states and UTs

- There are concerns over **fake registrations and fraudulent availmen**t of input tax credit under the Goods and Services Tax (GST) regime.

Geocoding

- It converts an address or **description of a location into geographic coordinates**.
- It has been introduced to **ensure the accuracy of address details in GSTN records** and streamline the address location and verification process.
- GST Network has already geocoded 1.8 crore principal places of businesses.
- The functionality is available for **normal, composition, SEZ units, SEZ developers**, input service distributor and casual taxpayers who are active, cancelled, and suspended.
- This is a **one-time activity** and once submitted, revision in the address is not allowed.
- The functionality will not be visible to the taxpayers who have already geocoded their address through new registration or core amendment.

Goods and Services Tax Network

- It is a **nonprofit non-government company** registered under Section 8 of the **Companies act, 2013.**
- It will provide shared **IT infrastructure and service** to both central and state governments including tax payers and other stakeholders.
- The **private players** hold **51% equity in the GSTN** and the Centre and State governments together holds **49% equity** in GSTN.

Sebi's SCORES platform disposes of 3,079 complaints in June

- SCORES is a **web based centralized grievance redress system of SEBI that was launched in June 2011.**
- SCORES e**nables investors to lodge and follow up their complaints** and **track the status of redressal** of such complaints online from the above website from anywhere.
- This **enables the market intermediaries and listed companies to receive the complaints online from investors**, redress such complaints and report redressal online.
- **All the activities** starting from lodging of a complaint till its closure by SEBI **would be online in an automated environment** and the complainant can view the status of his complaint online.
- **What types of complaints can be registered in the SCORE portal?** According to the regulatory authority, complaints can be lodged on SCORES **for any issues covered under the Sebi Act, Securities Contract**

Regulation Act, Depositories Act, and rules and regulations and provisions of Companies Act, 2013.

- **Entities against which complaints are handled by SEBI include:**
  - Listed companies / registrar & transfer agents
  - Brokers / stock exchanges
  - Depository participants / depository
  - Mutual funds
  - Portfolio Managers
  - Other entities (KYC Collective investment scheme, Merchant banker, Credit rating, Foreign institutional investor etc)
- **What types of complaints cannot be registered in the SCORES portal?**
  - Bank deposits and banking; fixed deposits with non-banking financial companies (NBFCs) and other matters pertaining to NBFCs. - RESERVE BANK OF INDIA (RBI)
  - Fixed deposits with manufacturing companies; unlisted companies; mismanagement of companies, financial performance of the company, annual general meeting, annual report, minority shareholders' interest, non-receipt of preferential allotment shares; corporate actions as per the court order, such as mergers, amalgamation, reduction of share capital/par value, etc. - MINISTRY OF CORPORATE AFFAIRS
  - Insurance companies / brokers / agents / products and services. - INSURANCE REGULATORY AND DEVELOPMENT AUTHORITY (IRDA)
  - Commodities - FORWARD MARKETS COMMISSION
  - Pension fund - PENSION FUND REGULATORY AND DEVELOPMENT AUTHORITY (PFRDA)
  - Monopoly and anti-competitive practices - COMPETITION COMMISSION OF INDIA (CCI)
  - Housing finance companies - NATIONAL HOUSING BANK

Securities and Exchange Board of India (SEBI):

- It was established in April 1988 as an executive body and was given statutory powers in January 1992 through the SEBI Act, 1992.
- It monitors and regulates the Indian capital and securities market while ensuring to protect the interests of the investors, formulating regulations and guidelines.

Government brings Goods & Services Tax Network under PMLA

Prevention of Money Laundering Act (PMLA)

- It is an **Act to prevent money laundering and to provide for the confiscation of property** derived from or involved in money laundering.
- The Act was formulated for the **following objectives:**
  - **Prevent money-laundering**.
  - **Combat/prevent channelising of money into illegal activities** and economic crimes.
  - Provide for the c**onfiscation of property derived from**, or involved/used in, **money laundering.**
  - Provide for matters connected and incidental to the acts of money laundering.
- The **Enforcement Directorate (ED)** in the Department of Revenue, Ministry

of Finance, **is responsible for investigating the offences** of money laundering under the PMLA.

- **Financial Intelligence Unit** – India (FIU-IND), under the Department of Revenue is the **central national agency** responsible **for receiving, processing, analysing, and disseminating information relating to suspect financial transactions.**
- The **scheduled offences are separately investigated by agencies mentioned under respective acts**, for example, the local police, CBI, customs departments, SEBI, or any other investigative agency, as the case may be.
- **Actions that can be initiated** against the person involved in money laundering:
    - **Seizure/freezing of property and records and attachment of property** obtained with the proceeds of crime.
    - Any person who commits the offence of money laundering shall be punishable with –
        - **Rigorous imprisonment for a minimum term of three years and this may extend up to seven years.**
        - **Fine (without any limit).**

For mutual funds, a temporary relief on expense ratio rules

Total Expense Ratio (TER)

- TER is a **measure of the total costs associated with managing** and operating **an investment fund,** such as a mutual fund.
- These costs consist **primarily of management fees and additional expenses**, such as trading fees, legal fees, auditor fees, and other operational expenses.
- The t**otal cost of the fund is divided by the fund's total assets** to arrive at a percentage amount, which r**epresents the TER.**
- TER is **also known as the net expense ratio or after reimbursement expense ratio**.
- **Why is TER important?**
    - It is **used by investors to compare the costs of the scheme** with its peers and also i**n relation to the returns available from that scheme.**
    - It is a **key element in making an investment choice**, as those funds which consistently show a high TER may not provide high returns, since high expenses tend to erode the returns generated.
    - For example, if a fund generates a return of 7% for the year but has a TER of 4%, then the 7% gain is greatly diminished to roughly 3%.
- **How is TER Calculated?**
    - **Total expense ratio = (Total Fund Costs / Total Fund Assets)100.*
- **Expenses Associated with Operating a Fund:** TER is the measure of all the expenses associated with running a scheme. These can include:
    - **Management fees**, probably the single largest item in the TER of a fund. These fees cover items such as fund manager salaries and research fees.
    - **Brokerages and taxes** in transacting the securities of the scheme.

- **Fees paid to trustees,** registrar and transfer agents, custodians, personnel of the trustee and Asset Management Company, etc.
- **Legal and accountancy fees;**
- **Sales and marketing expenses.**
- **Any other operational expenses** like rent, electricity, communication, etc. in proportion to the assets of the scheme.

Soft-release centres for Cheetals coming up at Palamu Tiger Reserve

Palamu Tiger Reserve

- It is located in the Chhota Nagpur plateau region **of Jharkhand.**
- The reserve forms a **part of the Betla National Park.**
- It is one of the first 9 tiger reserves created in the country at the inception of 'Project Tiger'.
- It is the first reserve in the world in which a tiger census was carried out as a pugmark count, as early as 1932 under the supervision of J.W. Nicholson
- Three rivers namely **North Koyal, Auranga and Burha** flow through the valleys.
- The area is draught drone with Burha being the only perennial river.
- The Reserve is very rich in minerals like Bauxite and Coal.
- **Vegetation:**
  - It is primarily dominated by **Northern Tropical Dry Deciduous**, Sal Forest and its associates.
  - Smaller patches of Northern tropical Moist Deciduous forests exist too in the Reserve.
- **Flora:** Shorea robusta, Acacia catechu, Madhuca indica, Terminalia tomentosa, Butea monosperma, Pterocarpus marsupium, Anogeisus latifolia, Indigofera pulchela etc.
- **Fauna:** Some keystone and principal species found in the reserve include Tiger, Asiatic Elephant, Leopard, Grey wolf, Wild dog, Gaur, Sloth bear and four horned antelope.

Cheetal

- The spotted deer or chital is the most **common deer species** in Indian forests.
- They live in **dense forests, forested valleys** and also prefer open grasslands, savannas, and plantations.
- **Conservation status**
  - **IUCN:** Least concern

Just why are tomato prices going north? Dalwai Report offers clues

- The **Dalwai committee** report had made many recommendations for better buying and selling of potatoes, onions and tomatoes and for the facilities of the farmers. According to the Dalwai Committee report, 58 per cent of tomatoes are sold by farmers to private traders. Processors do not buy tomatoes from farmers.
- Neither cooperative institutions nor agencies of the government show interest in this purchase. That is why the farmer is forced to sell the tomato crop to private players.
- The report of the Dalwai Committee laid special emphasis on the link between

farmer income and tomato losses. The report described the tomato as a "sensitive product for mass consumption".

- The report urged strengthening the **supply chain** for tomatoes. For this, **Operation Green** was launched, that included a scheme to deliver produce directly from the farm to the consumer. But its effect was not visible.
- According to the report and recommendations of the Dalwai Committee, issues like cold chain, modern pack houses and pooling points along with transport arrangements from the village have not been given much attention.

Major recommendations of Dalwai Committee

- **Agricultural Marketing** - The committee has called for placing agricultural marketing in the **Concurrent list**.
- This would facilitate the **one-India market concept**.
- Also, while cultivation is geographically limited, marketing has no boundaries which necessitates a pan-India level operation to meet the demand across the country.
- It has also recommended greater private sector participation in agri-marketing and logistics.
- **State Level Measures** -

1. Creation of better physical infrastructure.
2. Improved price information dissemination campaigns.
3. Reforming regulations that force farmers to sell their produce to local monopolies.

- **Producer Organisations** - It suggested increasing the number of farmer producer and village producer organisations (FPO/VPO).
- **FPOs and VPOs** could play a critical role in integrating the small and marginal farmers into the agricultural market system.
- Each FPO/VPO would cover 1,000 farmers and/or 1,000 hectares.
- It also called for amending the Companies Act to facilitate private sector shareholding in FPOs up to 26 per cent.
- Also, incentivising them by treating them at par with cooperative societies would be of help.
- **Marketing system** - **Wholesale** - The current agricultural marketing system comprises of Agricultural Produce Marketing Committees (APMCs) which operate principal markets and their extended sub-market yards.
- It is suggested that State Governments may convert these principal and sub-market yards into full-fledged and independent markets.
- **Private** - While this will help improve the number of wholesale markets, the remaining requirement has to be met by promoting private markets.
- This could be done under the provisions of the proposed Agricultural Produce and Livestock Marketing, (Promotion and Facilitation) Act, 2017 (**APLM**).
- The committee has also urged the Union Agriculture Ministry to roll out the Model APLM Rules so that States can make the act operational.
- **Rural** - It suggested upgrading the existing rural periodical markets as **Primary Rural Agricultural Markets** for meeting the rural retail markets demand.
- It also highlighted the need for both the Centre and the States/UTs constituting special purpose vehicles to own and operate the **National Agriculture Market**.

- These suggestions are in line with achieving the desired market density (wholesale and rural retail markets) to build a pan-India system.
- **Other recommendations** - The committee has opined that small and marginal farmers would benefit from an efficient marketing system only if they have the withholding capacity.
- For this, the committee has suggested offering **pledge finance** i.e.post-harvest loan against produce as collateral.
- Upgrading storage godowns, including cold storages is a prerequisite to make available Negotiable Warehouse Receipts for these loans.
- The Ministry has to develop comprehensive guidelines to promote warehouse-based post-harvest loans and eNWR (Negotiable Warehouse Receipts) based trading.
- There is also a need to orient financial institutions to participate in the pledge loan system.

Dalwai Committee

- The government announced to double farm incomes by 2022 in its Union Budget 2016-17.
- In line with this it appointed an 8-member inter-ministerial committee headed by Ashok Dalwai, to consider major reforms in agriculture sector.
- It was tasked to prepare a blueprint for transition of farm policies from being production oriented to based on incomes or value addition.

FPO/VPO

- A Farmer Producer Organisation is a kind of a hybrid company between cooperative societies and private limited companies.
- The objective of the concept is to organize farmers into a collective to improve their bargaining strength in the market.
- They are owned and governed by shareholder farmers (or artisans) and administered by professional managers.

ENVIRONMENT

Gambusia: This solution could actually be an invasive problem

- Andhra Pradesh releases 10 million mosquitofish in waterbodies to control malaria, dengue
- The Andhra Pradesh government has released approximately 10 million Gambusia fish into the state's water bodies to combat mosquito-borne diseases like malaria and dengue. The fish, also known as **mosquitofish**, is widely used as a biological agent for controlling mosquito larvae.
- However, the release of these invasive alien fish species has raised concerns about the potential harm that will be sustained by native species that abound in the state's freshwater bodies.
- ***Gambusia affinis*** *(G affinis)* is native to the waters of the southeastern United States and a single full grown fish eats about 100 to 300 mosquito larvae per day, according to MoHFW.
- Gambusia have been a part of mosquito-control strategies for over a century in various parts of the world, including India. *G affinis* has a sister species, ***Gambusia holbrooki (G holbrooki)***, also known as the eastern mosquito fish.
- Mosquitofish has been part of various malaria control strategies in India since 1928, including the Urban Malaria Scheme.
- There are also studies that reported that Gambusia's predatory efficacy reduced when they were introduced in running water streams, water bodies with high insecticide levels and waterbodies with thick vegetation.

Highly invasive

- There are other concerns too: The fish has a **high breeding capacity**.
- The fish can also survive in diverse environments.
- It is this adaptability that has allowed the fish to survive on six out of seven continents and has made the International Union for Conservation of Nature declare Gambusia one of the 100 worst **invasive alien species** in the world. Multiple countries, including India have listed Gambusia as **invasive species**.

NGT has imposed a fine of about 80,000 crore so far on states for not disposing of sewage and garbage

If this amount was to be deposited by the states, it would be 48% more than the CAMPA fund.

The National Green Tribunal (NGT) has so far imposed fines of about Rs 80,000 crore on states and Union territories (UT) for non-compliance of sewage treatment and garbage disposal rules and for violating orders.

National Green Tribunal (NGT)

- It is a specialised body set up under the National Green Tribunal Act (2010) for effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources.
- With the establishment of the NGT, India became the third country in the world to set up a specialised environmental tribunal, only after Australia and New Zealand, and the first developing country to do so.
- NGT is mandated to make disposal of applications or appeals finally within 6

months of filing of the same.
- The NGT has five places of sittings, New Delhi is the Principal place of sitting and Bhopal, Pune, Kolkata and Chennai are the other four.

Structure of NGT
- The Tribunal comprises of the Chairperson, the Judicial Members and Expert Members. They shall hold office for term of three years or till the age of sixty-five years, whichever is earlier and are not eligible for reappointment.
- The Chairperson is appointed by the Central Government in consultation with Chief Justice of India (CJI).
- A Selection Committee shall be formed by central government to appoint the Judicial Members and Expert Members.
- There are to be least 10 and maximum 20 full time Judicial members and Expert Members in the tribunal.

Powers & Jurisdiction
- The Tribunal has jurisdiction over all civil cases involving substantial question relating to environment (including enforcement of any legal right relating to environment).
    - In October 2021, the Supreme Court declared the National Green Tribunal's (NGT) position as a "unique" forum **endowed with suo motu (on its own motion) powers to take up environmental issues** across the country.
        - As per SC, the role of the NGT is not simply adjudicatory in nature; it has to perform equally vital roles that are preventative, ameliorative or remedial in nature.
- Being a statutory adjudicatory body like Courts, apart from original jurisdiction side on filing of an application, NGT also has appellate jurisdiction to hear appeal as a Court (Tribunal).
- The Tribunal is not bound by the procedure laid down under the Code of Civil Procedure 1908, but shall be guided by principles of 'natural justice'.
- While passing any order/decision/ award, it shall apply the principles of sustainable development, the precautionary principle and the polluter pays principle.
- NGT by an order, can provide
    - relief and compensation to the victims of pollution and other environmental damage (including accident occurring while handling any hazardous substance),
    - for restitution of property damaged, and
    - for restitution of the environment for such area or areas, as the Tribunal may think fit.
- An order/decision/award of Tribunal is executable as a decree of a civil court.
- The NGT Act also provides a procedure for a penalty for non compliance:
    - Imprisonment for a term which may extend to three years,
    - Fine which may extend to ten crore rupees, and
    - Both fine and imprisonment.
- An appeal against order/decision/ award of the NGT lies to the Supreme Court, generally within ninety days from the date of communication.
- The NGT deals with civil cases under the seven laws related to the environment, these include:

- The Water (Prevention and Control of Pollution) Act, 1974,
- The Water (Prevention and Control of Pollution) Cess Act, 1977,
- The Forest (Conservation) Act, 1980,
- The Air (Prevention and Control of Pollution) Act, 1981,
- The Environment (Protection) Act, 1986,
- The Public Liability Insurance Act, 1991 and
- The Biological Diversity Act, 2002.

- Any violation pertaining to these laws or any decision taken by the Government under these laws can be challenged before the NGT.

Strengths of NGT

- Over the years NGT has emerged as a critical player in environmental regulation, passing strict orders on issues ranging from pollution to deforestation to waste management.
- NGT offers a path for the evolution of environmental jurisprudence by setting up an alternative dispute resolution mechanism.
- It helps reduce the burden of litigation in the higher courts on environmental matters.
- NGT is less formal, less expensive, and a faster way of resolving environment related disputes.
- It plays a crucial role in curbing environment-damaging activities.
- The Chairperson and members are not eligible for reappointment, hence they are likely to deliver judgements independently, without succumbing to pressure from any quarter.
- The NGT has been instrumental in ensuring that the Environment Impact Assessment process is strictly observed.

Challenges

- Two important acts - Wildlife (Protection) Act, 1972 and Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 have been kept out of NGT's jurisdiction. This restricts the jurisdiction area of NGT and at times hampers its functioning as crucial forest rights issue is linked directly to environment.
- The NGT decisions are being challenged in various High Courts under Article 226 (power of High Courts to issue certain writs) with many asserting the superiority of a High Court over the NGT, claiming 'High Court is a constitutional body while NGT is a statutory body'." This is one of the weaknesses of the Act as there is lack of clarity about what kind of decisions can be challenged; even though according to the NGT Act, its decision can be challenged before the Supreme Court.
- Decisions of NGT have also been criticised and challenged due to their repercussions on economic growth and development.
- The absence of a formula based mechanism in determining the compensation has also brought criticism to the tribunal.
- The decisions given by NGT are not fully complied by the stakeholders or the government. Sometimes its decisions are pointed out not to be feasible to implement within a given timeframe.
- The lack of human and financial resources has led to high pendency of cases - which undermines NGT's very objective of disposal of appeals within 6 months.

- The justice delivery mechanism is also hindered by limited number of regional benches.

Important Landmark Judgements

- In 2012, POSCO a South-Korean steelmaker company signed a MoU with the Odisha government to set up steel project.
    - **NGT suspended order** and this was considered a radical step in favour of the local communities and forests.
- In 2012 Almitra H. Patel vs. Union of India case, NGT gave judgment of complete prohibition on open burning of waste on lands, including landfills – regarded as the single biggest landmark case dealing with the issue of solid waste management in India.
- In 2013 in Uttarakhand floods case, the Alaknanda Hydro Power Co. Ltd. was ordered to compensate to the petitioner – here, the NGT directly relied on the principle of 'polluter pays'.
- In the ***Save Mon Federation Vs Union of India case (2013)***, the NGT suspended a ₹6,400-crore hydro project, to save the habitat of a bird.
- In 2015, the NGT ordered that all diesel vehicles over 10 years old will not be permitted to ply in Delhi-NCR.
- A December 2016 amendment to EIA 2006 notification — the amendments basically sought to give local authorities powers to grant environmental clearance to builders — was nullified by the NGT, terming it as a "ploy" (by the government) to circumvent the 2006 rules.
    - Many Projects which were approved in violation of the law such as an Aranmula Airport, Kerala; Lower Demwe Hydro Power Project and Nyamnjangu in Arunachal Pradesh; mining projects in in Goa; and coal mining projects in Chhattisgarh were either cancelled or fresh assessments were directed.
- In 2017, the Art of Living Festival on Yamuna Food Plain was declared violating the environmental norms, the NGT panel imposed a penalty of Rs. 5 Crore.
- The NGT, in 2017, imposed an interim ban on plastic bags of less than 50-micron thickness in Delhi because "they were causing animal deaths, clogging sewers and harming the environment".

America's largest reptile sanctuary wants to import gharials from India

- The Phoenix Herpetological Society has requested a permit to import gharials and crocodiles from Madras Crocodile Bank Trust
- America's largest reptile bank based in Arizona has applied to the Federal Government to import six **gharials** and another equal number of **mugger crocodiles** from Tamil Nadu, which it says would help preserve these endangered species.
- The Federal Government has asked for public comments on this matter.

Gharials

- Gharials, sometimes called gavials, are a type of Asian crocodilian distinguished by their long, thin snouts. Crocodilians are a group of **reptiles** that includes crocodiles, alligators, caimans, and more.
- India has **three species of Crocodilians namely:**
- **Gharial (Gavialis gangeticus)**: **IUCN Red List** Critically Endangered

- **Mugger crocodile (Crocodylus palustris)**: **IUCN- Vulnerable.**
- **Saltwater crocodile (Crocodylus porosus)**: IUCN- Least Concern.
- All the three are listed on **Appendix I of CITES and Schedule I of the Wild Life (Protection) Act, 1972.Exception**: Saltwater Crocodile populations of Australia, Indonesia and Papua New Guinea are included in **Appendix II of CITES.**
- **Habitat of Gharials:**
    - **Natural Habitat:** Fresh waters of the northern part of India.
    - **Primary Habitat: Chambal river** (a tributary of Yamuna).
    - **Secondary Habitat: Ghagra**, Gandak river, Girwa river (Uttar Pradesh), the Ramganga river (Uttarakhand) and the Sone river (Bihar).
- **Significance:** Population of Gharials are a good indicator of clean river water.
- **Conservation Efforts:**
    - Breeding Centres of Kukrail Gharial Rehabilitation Centre in Lucknow, Uttar Pradesh, National Chambal Sanctuary (Gharial Eco Park, Madhya Pradesh).
- **Threats:**
    - Increased river pollution, dam construction, massive-scale fishing operations and floods.
    - Illegal sand mining and poaching.

Will benefits from genetic resources ever reach communities?

Over the last two years, there have been extensive discussions around the concept of access and benefit sharing linked to genetic resources. This has been at the core of discussions under the Convention on Biological Diversity's (CBD) Global Biodiversity Framework; World Health Organization's Pandemic Treaty; the Agreement on the Conservation and Sustainable Use of Marine Biodiversity Beyond National Jurisdiction and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA).

'International Treaty on Plant Genetic Resources for Food and Agriculture' (ITPGRFA)

- The International Treaty on Plant Genetic Resources for Food and Agriculture (also known as ITPGRFA, International Seed Treaty or Plant Treaty), is **a comprehensive international agreement in harmony with the Convention on Biological Diversity**.
- The International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) **is a comprehensive agreement that aims to establish a global system which provides farmers, plant breeders, and scientists with access to plant genetic resources.**
- The treaty provides solutions to achieve food and nutritional security as well as climate resilient agriculture.

Aim and Objective

- It aims at **guaranteeing food security through the conservation, exchange and sustainable use** of the world's plant genetic resources for food and agriculture (PGRFA), the fair and equitable benefit sharing arising from its use, as well as the recognition of farmers' rights.

Signing

- ITPGRFA is a **legally binding comprehensive agreement** adopted in November, 2001 at Rome during the 31st session of Food and Agriculture

Organization of the United Nations, which entered into force on June 29, 2004

Participating countries

- There are 149 contracting parties to the Plant Treaty (147 Member States and 1 intergovernmental organization, the European Union). India is a party too.

Importance

- Countries are inter-dependent for PGRFA and consequently a global order is essential to facilitate access and benefit sharing.
- Thus, conservation and sustainable use of PGRFA are essential to achieving sustainable agriculture and food security, for present and future generations.
- It is indispensable for crop genetic improvement to adapting to unpredictable environmental changes and human needs.
- Because countries are interdependent in their reliance on PGRFA and the management of PGRFA is at the **meeting point between agriculture, the environment and commerce,** the International Treaty has established a multilateral system that facilitates continuous exchange of PGRFA (Multilateral System of Access and Benefit-sharing).

Convention on Biological Diversity (CBD)

- The Convention on Biological Diversity (CBD), known informally as the Biodiversity Convention, is a multilateral treaty. The Convention has three main goals: the **conservation of biological diversity (or biodiversity); the sustainable use of its components; and the fair and equitable sharing of benefits arising from genetic resources.** Its objective is to develop national strategies for the conservation and sustainable use of biological diversity, and it is often seen as the key document regarding sustainable development.
- The Convention was opened for signature at the Earth Summit in Rio de Janeiro on 5 June 1992 and entered into force on 29 December 1993. The United States is the only UN member state which has not ratified the Convention. It has two **supplementary agreements, the Cartagena Protocol and Nagoya Protocol.**
- The Cartagena Protocol on Biosafety to the Convention on Biological Diversity is an international treaty governing the movements of living modified organisms (LMOs) resulting from modern biotechnology from one country to another. It was adopted on 29 January 2000 as a supplementary agreement to the CBD and entered into force on 11 September 2003.
- The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization (ABS) to the Convention on Biological Diversity is another supplementary agreement to the CBD. It provides a transparent legal framework for the effective implementation of one of the three objectives of the CBD: the fair and equitable sharing of benefits arising out of the utilization of genetic resources. The Nagoya Protocol was adopted on 29 October 2010 in Nagoya, Japan, and entered into force on 12 October 2014.
- **2010 was also the International Year of Biodiversity,** and the Secretariat of the CBD was its focal point. Following a recommendation of CBD signatories at Nagoya, the **UN declared 2011 to 2020 as the United Nations Decade on Biodiversity** in December 2010.

Global Biofuel Alliance can power India's energy transition drive, but must have time-bound targets

- The focus will be on strengthening markets, facilitating global biofuel trade, sharing concrete policy lessons and providing technical support for national biofuel programmes
- The upcoming 14th Clean Energy Ministerial and Eighth Mission Innovation (CEM14/MI-8) conference, scheduled to take place in Goa from July 19-22, 2023, is likely to establish the Global Biofuel Alliance (GBA).CEM serves as a prominent international platform, bringing together influential figures to promote clean energy technology and knowledge exchange and facilitate the global transition towards a clean energy economy.
- Under the leadership of India during its G20 Presidency and with the support of Brazil and the United States, the alliance will focus on fostering international collaboration and cooperation to encourage the widespread acceptance and utilisation of biofuels.

Global Biofuels Alliance

- **Aim:** To facilitate cooperation and intensify the use of sustainable biofuels, including in the transportation sector.
- – The alliance will place emphasis on strengthening markets, facilitating global biofuels trade, development of concrete policy lesson-sharing and provision of technical support for national biofuels programs worldwide.
- – It will also emphasize the already implemented best practices and success cases.
- **The Alliance shall work in collaboration** with and complement the relevant existing regional and international agencies as well as initiatives in the bioenergy, bioeconomy, and energy transition fields more broadly including the **Clean Energy Ministerial** Biofuture Platform, the Mission Innovation Bioenergy initiatives and Global Bioenergy Partnership (GBEP).

Global Bioenergy Partnership(GBEP)

- **Founded in**: 2006
- **Purpose:** GBEP brings together public, private and civil society stakeholders in a joint commitment to promote bioenergy for sustainable development.
- **Focus areas**: The Partnership focuses its activities on three strategic areas: Sustainable Development – Climate Change – Food and Energy Security
- **India** is one of the observer countries.

Arikomban enters Srivilliputhur Megamalai Reserve

Srivilliputhur Megamalai Tiger Reserve (SMTR)

- **Location**:
  - It is spread across the districts of Theni, Virudhunagar and Madurai **in Tamil Nadu.**
  - It lies in the **Western Ghats region.**
- SMTR is **India's 51st tiger reserve** and **5th tiger reserve of Tamil Nadu**.
- It was **formed in February 2021** by **combining Grizzled Squirrel Wildlife Sanctuary and Megamalai Wildlife Sanctuary.**
- It will function as a **connecting link between Kerala's Periyar Tiger Reserve** and **Tamil Nadu's Southern Kalakkad-Mundanthurai Tiger Reserve**.

- SMTR will **provide protection to Megamalai**, the **Vaigai River's primary catchment**, in turn helping water levels to rise in the river.
- **Flora**: It's a **blend of tropical evergreen and semi-evergreen forests**, dry deciduous and moist mixed deciduous woods, and grasslands.
- **Fauna**:
    - **Mammals**: **Elephants, Tiger, Leopard, Nilgiri Tahr, Gaur, Spotted Deer**, Barking Deer, Sambar Deer, Wild Boar, Porcupine, Nilgiri Langur, Lion-Tailed Macaque etc.
    - **Birds**: **Red-Whiskered Bulbul, Common Iora, White-Browed Wagtail**, Grey Wagtail, Pied Bush Chat etc.
    - **Reptiles**: **Wood Snake, Monitor Lizard**, Chameleon, etc.

Vaigai River

- It is a **river in Tamil Nadu state.**
- **Origin**: It rises in the **Varushanad Hills of the Western Ghats.**
- It **travels through the Pandya Nadu region** of Tamil Nadu.
- It is the **major river in the fabled city of Madurai**, the **capital** of the ancient and prosperous **Pandya kingdom** located in southern Tamil Nadu.
- The river **finds a mention in Sangam literature** dated to 300 before Common Era.
- **Length**: Vaigai River is **258 kilometres long**.
- **Tributaries**: Its main tributaries are **Suruliyaru, Mullaiyaru, Varaganadhi, Manjalaru**, Kottagudi, Kridhumaal and Upparu.
- It finally **empties into the Palk Strait** near the Pamban Bridge in Ramanathapuram district.
- **Vaigai Dam:** The Vaigai dam is termed to be an important dam that is **built across the river near Andipatti in the Theni district** of Tamil Nadu.
- The river **fulfils the drinking water requirement** of five districts of Tamil Nadu namely, Theni, Madurai, Ramnathapuram, Sivagangai and Dindigul. It **also provides irrigation to 200,000 hectares of agricultural land.**
- The **once perennial river is now completely dry,** and animals in large numbers graze on its riverbed.

Yamuna Water Level Ghaggar River Flooding Impact

- Ghaggar, Tangri, Markanda and others are **considered dead rivers** in the state and heavily encroached upon but in this monsoon season they reclaimed their floodplains and caused heavy losses.

Ghaggar River

- The Ghaggar and many of its tributaries originate in the **Shivalik foothills** of Haryana, Punjab and Chandigarh.
- Among these tributaries, the **Kaushalya, Tangri, Markanda, Beghna** and Sukhna rivers are the ones that merge into the Ghaggar.
- The Ghaggar-Hakra River is an **intermittent river** in India and Pakistan that flows only **during the monsoon season.**
- The river is known as Ghaggar in India, before the Ottu barrage, and as the Hakra in Pakistan, downstream of the barrage.
- It eventually dries up in the **Great Indian (Thar) Desert.**

Over 60 species of plants that can survive extreme dehydration found in

Western Ghats

- In the biodiversity hotspot Western Ghats, researchers have found 62 species of plants that can withstand harsh environments . The discovery of the species, called **desiccation-tolerant** (DT) vascular plants, has potential applications in agriculture, particularly in areas where water is scarce.
- DT plants can withstand extreme dehydration, losing up to 95 per cent of their water content. They are usually found in rocky outcrops in the tropics and can recover quickly when water supplies are restored.
- Futuristically speaking, the genes of these plants could be used to create a high-temperature tolerant variety of crops to improve climate resilience and ensure food security for the mass.
- Some plant species — ranging from algae to angiosperms — thrive in harsh environments and are termed as **extremophytes.** These species are found in extreme habitats, like hot and cold deserts, estuaries, rock outcrops, glaciers and other arid and semi-arid regions.
- To adapt to extreme conditions, these plant species develop adaptive strategies to survive through morphological and physiological traits
- Out of the 62 species identified, 16 are **endemic** to India while 12 are exclusive to Western Ghats outcrops, said Aboli Kulkarni, another author of the study.
- **Hydration and desiccation-tolerance** are two commonly studied strategies for plants in extreme habitats, he added.
- "Hydration is a condition where plant tissues can tolerate more than **30 per cent of water content**. But in desiccation, plants undergo longer dry days during which the moisture content of the leaves is the same as in the air," he said.
- Some bryophytes, ferns, lycophytes and angiosperms growing in seasonally dry and semi-arid habitats have evolved a mechanism known as desiccation-tolerance by which plants can tolerate a loss of 80–95 per cent of their relative water content and resurrect back.
- DT plant varieties are found in both flowering and non-flowering species and in both temperate and tropical climates. The global population of these species ranges between 300 and 1,500, according to the study.

One dead, seven injured in clash between forest team, encroachers

Bura Chapori Wildlife Sanctuary

- It is located on the **southern bank of river Brahmaputra** in the Sonitpur district, **Assam.**
- It is a part of the Laokhowa-Burachapori eco-system.
- **Flora:**
    - It comprises of a mosaic of **wet alluvial grassland**, riparian and **semi-evergreen forests** dotted by wetland and river systems.
    - The grassland is also rich in various kinds of medicinal herbs and plants.
- **Fauna:**
    - It is home to the **Great Indian one-horned rhinoceros**, tiger, leopard, wild buffalo, hog deer, wild pig, and elephants.
    - It includes the highly endangered Bengal Florican.

- It also makes it **an ideal breeding place** for several species of migratory birds during the winter season.

Genetic resources commission gathers in Rome to deliberate on biodiversity, nutrition & human health

CGRFA

- It is the only permanent **intergovernmental body** that deals with all components of **biodiversity for food and agriculture.**
- It was established in 1983.
- **Aim:** To reach international consensus on policies for the **sustainable use and conservation of genetic resources** for food and agriculture and the fair and equitable sharing of benefits derived from their use.
- **Member:** It has 179 countries as its members.
- **India is also a member** of this commission.
- **Functions:**
  - The intergovernmental body guides the preparation of **periodic global assessments** of the status and trends of **genetic resources and biodiversity** for food and agriculture.
  - It also develops global plans of action, codes of conduct or other policy instruments and monitors their implementation.
- Some of the Commission's landmark achievements include: the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA).

ITPGRFA

- It was adopted by the Thirty-First Session of the Conference of the Food and Agriculture Organization of the **United Nations on 3 November 2001.**
- **The Treaty aims at:**
  - Recognizing the enormous contribution of farmers to the diversity of crops that feed the world.
  - Establishing a **global system to provide farmers**, plant breeders and scientists with access to plant genetic materials.
  - Ensuring that recipients share benefits they derive from the use of these genetic materials with the countries where they have been originated.

Shri Kiren Rijiju says IMD has launched Heat Index

Heat Index

- It provides **information about the impact of humidity on the high temperatures** and thus provides a feel like temperature for human beings which can be used as an indication for human discomfort.
- It provides guidance towards additional care to be taken by people to reduce discomfort.
- **Colour codes** used for Experimental Heat Index are as follows:
  - **Green:** Experimental heat Index less than 35° C
  - **Yellow:** Experimental heat Index in the range 36-45° C
  - **Orange:** Experimental heat Index in the range 46-55°C
  - **Red:** Experimental heat Index greater than 55 °C
- The Heat Index is implemented on experimental basis only across the entire country including the State of Andhra Pradesh.

- At present, heat index is derived using the heat index equation similar to what is used by National Weather Service, National Oceanic and Atmospheric Administration (NOAA), USA.

IMD

- It is the main agency responsible for **meteorological observations, weather forecasting and seismology in India.**
- It operates hundreds of observation stations across India and Antarctica.
- Regional offices are in Chennai, Mumbai, Kolkata, Nagpur, Guwahati and New Delhi.
- It has the responsibility for **forecasting, naming and distributing warnings for tropical cyclones** in the Northern Indian Ocean region, including the Malacca Straits, the Bay of Bengal, the Arabian Sea and the Persian Gulf.
- **Nodal Ministry:** Ministry of Earth Sciences.

'Zombie fires' in the Arctic: Canada's extreme wildfire season offers a glimpse of new risks in a warmer, drier future

- It is a fire from a previous growing season **that can smoulder under** the ground which is made up of **carbon-rich peat.**
- These smouldering fires also produce more smoke because of their lower temperature of combustion.
- **Why it occurs?**
    - As the **organic-rich Arctic soils** dry up because of changing climate conditions, they can burn slowly and release vast amounts of smoke into the atmosphere.
    - One major culprit is the **rising temperature**: The Arctic is warming nearly four times faster than the rest of the world, a phenomenon known as Arctic amplification.
    - Among the changing conditions that favour wildfires are **changes in atmospheric circulation** that create periods of extreme heat, dry out vegetation and reduce moisture in soils, and, importantly, lead to more frequent lightning strikes that can spark blazes.
- **What is the Impact?**
    - As the Arctic warms and fires move farther northward, peat soils rich in dead plant material burn at an accelerated rate.
    - The **burning peat also removes the layer insulating permafrost**, the region's frozen carbon-rich soil.
    - Northern ecosystems store twice as much carbon in their peat and permafrost as the atmosphere, and both are increasingly vulnerable to fire.

Cloudburst in Uttarakhand's Uttarkashi village damages houses, roads; schools closed

Purola village in Uttarakhand's Uttarkashi district was badly affected in a cloudburst incident late on Friday night that also damaged several houses and roads.

Cloudbursts

- Cloudbursts are **short-duration, intense rainfall events over a small area.**It is a weather phenomenon with unexpected **precipitation exceeding

100mm/h over a geographical region of approximately 20-30 square km.**In the Indian Subcontinent, it **generally occurs when a monsoon cloud drifts northwards,** from the Bay of Bengal or the Arabian Sea across the plains then on to the Himalaya that sometimes brings 75 millimetres of rain per hour.

- **Occurrence:**
  - The **relative humidity and cloud cover is at the maximum level with low temperature and slow winds** because of which a high amount of clouds may get condensed at a very rapid rate and result in a cloudburst.
  - **As temperatures increase, the atmosphere can hold more and more moisture and this moisture comes down as a short very intense rainfall for a short duration** probably half an hour or one hour resulting in flash floods in the mountainous areas and urban floods in the cities.
- **Cloudburst are Different from Rainfall:**
  - Rain is condensed water falling from a cloud while cloudburst is a sudden heavy rainstorm.
  - Rain **over 100mm per hour is categorised as a cloudburst.**
  - The cloudburst is a natural phenomenon, but occurs quite unexpectedly, very abruptly, and rather drenching.
- **Impact of Climate Change:**
  - Several studies have shown that climate change **will increase the frequency and intensity of cloudbursts** in many cities across the globe.
    - In May 2021, the **World Meteorological Organization** noted that there is about **a 40% chance of the annual average global temperature temporarily reaching 1.5°C above the pre-industrial level** in at least one of the next five years.
    - It added that there is **a 90% likelihood of at least one year between 2021 and 2025 becoming the warmest on record and dislodge 2016** from the top rank.
  - It is seen that **more cloudbursts are happening in Himalayan region because the decadal temperature rise** in the Himalayan region is higher than the global rate of rising temperatures.

39 Held So Far In Indravati Tiger Reserve Poaching Case

Indravati Tiger Reserve

- **Location**: It is located in the **Bijapur district of Chhattisgarh.**
- The park derives its **name from the Indravati River**, which **flows from east to west** and forms the **northern boundary of the reserve with** the Indian state of **Maharashtra.**
- Indravati attained the status of a national park in 1981 and a **tiger reserve in 1983 under Project Tiger.**
- **Topography**: It mainly comprises of **undulating hilly terrain with altitudes** ranging between **177 to 599 m above sea level.**
- **Vegetation**: Three major forest types are recognized in Indravati: **Moist Mixed Deciduous Forest with Teak**, **Moist Mixed Deciduous Forest**

without Teak, **and Southern Dry Mixed Deciduous Forest.**

- **Flora**: Some common species include **teak, achar, karra, kullu, shisham,** semal, haldu, arjun, bel and Jamun.
- **Fauna**:
  - It is home to one of the **last populations of rare wild buffalo.**
  - Major faunal species include **tiger, leopard, striped hyena, wolf, common mongoose,** freshwater crocodile, common monitor lizard, Indian bull frog, herons, white-necked stork, black-necked stork, white ibis, black ibis etc.

Indravati River

- It is a **tributary of the Godavari River** and flows through the central Indian states of **Maharashtra, Chhattisgarh, and Odisha.**
- **Origin**: It rises in the **Kalahandi district of Odisha** on the western slopes of the Eastern Ghats.
- **Length**: It flows for **535 km** and has a **drainage area of 41, 665 sq. km**.
- **Course**: After originating in Odisha, **it flows westwards to join the Godavari**, thus forming **the boundary between Maharashtra and Chhattisgarh states at some places**.
- The famous Chitrakoot falls forms on Indravati River in Chhattisgarh.
- The Indravati River is **sometimes known as the "lifeline" of the Bastar District**, which is known as one of the greenest districts in India.
- **Tributaries**:
  - The major **right-bank tributaries** of the Indravati River are **Bhaskel River, Narangi River, Nimbra River**, Kotri River and Bandia River.
  - The **Nandiraj River is the only important left-bank tributary** of the Indravati River.
- **Indravati Dam:**
  - Indravati Dam, or the **Upper Indravati Hydro Power Project,** was built near the town of **Mukhiguda in the Kalahandi district**.
  - It is one of the largest dams in India as well as Asia and **produces 600 MW of electricity.**
  - The project envisages the **diversion of water of the Indravati River** in its upper reaches **into the Mahanadi valley** for power generation and irrigation.

Rare Orchid Species Found In U'khand's Chopta Valley

Cymbidium Lancifolium

- This is one of the beautiful species of Cymbidium, also **known as Lance leafed Cymbidium.**
- Cymbidium orchids are one of the **most popular orchid species** cultivated on a large scale worldwide.
- **Distribution:** This species is found **naturally in India in Himalayas,** Assam, Sikkim, Nepal, Bhutan, China, Taiwan, Japan and many of the SE Asian countries
- They grow at altitudes of 300 to 2300 M.
- In a natural condition, they **grow in broad leaf forests** where the **soil is rich in humus** and also plenty of leaf litter.
- The plant is generally **grown in cool to intermediate temperature**

conditions but with bright light.
- They are highly **valued in horticulture and are commonly sold as cut flowers** and potted plants on a commercial scale due to their long-lasting property, wide range of colours and elegant appearance, making them a favourite choice for both indoor and outdoor decoration.

Australia's 'seahorse hotels' aim to save endangered species

White's Seahorse

- It is commonly seen holding onto the **nets of swimming enclosures.**
- The species was named after John White, Surgeon General to the First Fleet.
- Seahorses are often considered a **flagship species** for conservation.
- **Male seahorses** can be recognised by the presence of a **pouch below the abdomen** which is absent in females.
- It is usually very well **camouflaged in various shades** of brown, grey and black.
- **Habitat:**
    - These are **endemic to Australia.**
    - It occurs in depths down to about 25 m in temperate marine waters along the south-eastern and south-western coasts of Australia. It is common in Sydney Harbour.
- **Breeding behaviours**
    - The reproduction of seahorses is truly remarkable.
    - The male seahorse has a pouch (a marsupium) into which the female seahorse lays her eggs.
    - In White's Seahorse, the **male fertilises the eggs** and cares for them for about three weeks.
    - **Threat:** The primary cause for the decline in abundance of White's Seahorse is the **loss of natural habitats** across their range in eastern Australia.
- **Conservation Status:**
    - **IUCN:** Endangered

India signs Host Country Agreement with the ITU

STAR-C Initiative

- The programme aims to **boost solar power ecosystems** in the poorest countries.
- The initiative is run by the **International Solar Alliance** in partnership with the **United Nations Industrial Development Organisation (UNIDO).**
- It aims to create a **strong network of institutional capacities within ISA member** states to enhance quality infrastructure for the uptake of solar energy products and services.
- The project is also funded by France.
- **Programme's objectives:** Building solar workforces, standardizing products, setting up infrastructure, and raising awareness among policymakers in developing countries.
- Through this initiative, India aims to enhance the institutional capacities of **International Solar Alliance** member states and contribute to the development of quality infrastructure for solar energy uptake.

International Solar Alliance

- It was conceived as **a joint effort by India and France** to mobilize efforts against climate change through deployment of solar energy solutions.
- It was conceptualized on the side-lines of the 21st Conference of Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC) held in **Paris in 2015.**
- With the amendment of its Framework Agreement in 2020, all member states of the United Nations are now eligible to join the ISA.
- **Headquarter:** India

Two weather phenomena to decide fate of agriculture in Indo-Gangetic belt

Agriculture in dry regions to suffer if rainfall deficit continues; Indian Ocean Dipole and El Nino huge factors

Rice, the most important of all the Kharif crops, is produced in Punjab and along the Indo Gangetic plain and the Kaveri and Godavri belts. The sowing area for paddy in 2023 has already shrunk by eight per cent compared to last year, according to Crop Weather Watch Group.

The reproduction stage is the most important phase in the cycle.

El Nino — the warming phase of the El Nino-Southern Oscillation weather phenomenon — will be a factor, the Indian Ocean Dipole (IOD) should neutralise the extreme effects.

Indian Ocean Dipole (IOD)

- **IOD or Indian Nino:**
  - IOD, sometimes referred to as the **Indian Nino**, is similar to the **El Nino** phenomenon, **occurring in the relatively smaller area** of the Indian Ocean between the **Indonesian and Malaysian coastline in the east and the African coastline near Somalia** in the west.
    - **The El Nino** is the warmer-than-normal phase of the **El Nino Southern Oscillation (ENSO) phenomenon**, during which there are generally warmer temperatures and less rainfall than normal in many regions of the world, including India.
  - One side of the ocean, along the equator, gets warmer than the other.
  - IOD is said to be positive when the western side of the Indian Ocean, near the **Somalia coast, becomes warmer** than the eastern Indian Ocean.
  - It is negative when the **western Indian Ocean is cooler.**
- **Mechanism:**
  - Negative IOD:
  - The air circulation in the Indian Ocean basin moves from **west to east**, that is from the **African coast towards the Indonesian islands,** near the surface, and in the opposite direction at the upper levels. That means the **surface waters in the Indian Ocean get pushed from west to east.**
    - In a normal year, **warmer waters in the western Pacific** near Indonesia cross over into the Indian Ocean and make that part of the Indian Ocean slightly warmer. That causes the air to rise and helps the prevailing air circulation.
  - In the years when the air circulation **becomes stronger, more warm**

surface waters from the African coast are pushed towards the Indonesian islands, making that region warmer than usual. This causes hotter air to rise, and the **cycle reinforces itself.**
    - This is the **state of negative IOD.**
- **Positive IOD:**
    - Air circulation becomes **slightly weaker** than normal. In some rare cases, the air circulation **even reverses direction.** The consequence is that the African coast **becomes warmer while the Indonesian coastline gets cooler.**
        - A positive IOD event is often seen developing at times of an **El Nino, while a negative IOD is sometimes associated with La Nina.**
    - During El Nino, the Pacific side of Indonesia is cooler than normal because of which the Indian Ocean side also gets cooler. That **helps the development of a positive IOD.**
- **Impact of IOD:**
    - In the Indian Ocean, IOD exhibits **an ocean-atmosphere interaction** that closely resembles the fluctuations observed during El Niño events in the **Pacific Ocean.** However, the IOD is considerably **less powerful compared to El Niño, resulting in relatively minimal impacts.**
    - A positive IOD helps rainfall **along the African coastline and also over the Indian sub-continent** while suppressing rainfall over Indonesia, southeast Asia and Australia. The impacts are opposite during a negative IOD event.
- **Past Events:**
    - In 2019 the IOD event developed during the late monsoon but was **so strong that it compensated for the deficit rainfall** during the first month of the monsoon season (June had 30% deficiency that year).
        - The deficit in June that year was also **attributed to a developing El Nino but that fizzled out later.**

ENSO

- In a normal year, the eastern side of the Pacific Ocean, near the **northwestern coast of South America**, is cooler than the western side near the islands of Philippines and Indonesia.
    - This happens because the **prevailing wind systems that move from east to west sweep the warmer surface** waters towards the Indonesian coast.
- The relatively **cooler waters from below come up** to replace the displaced water.
- An El Nino event is the **result of a weakening of wind systems that leads to lesser displacement** of warmer waters.
- This results in the **eastern side of the Pacific becoming warmer** than usual. During **La Nina, the opposite happens.**
- Both these conditions, together called **El Nino Southern Oscillation (ENSO)**, affect weather **events across the world.**
- Over India, the El Nino has the **impact of suppressing monsoon rainfall.**

What are marine heat waves, which have gripped parts of the world's oceans

this summer?

- While an increase of 3 or 4 degrees Celsius in average temperatures may not be much for humans, it can be catastrophic for marine life and cause Marine heat waves (MHWs) that may result in the deaths of several species, coral bleaching and more intense storms.
- In April, it reached 21.1 degrees Celsius, breaking the previous record of 21 degrees Celsius in 2016. And since then, ocean temperatures have remained at record-high levels, giving rise to marine heat waves (MHWs) around the globe.

Marine heat waves

A marine heat wave is an extreme weather event. It occurs when the surface temperature of a particular region of the sea rises to 3 or 4 degree Celsius above the average temperature for at least five days. MHWs can last for weeks, months or even years, according to the US government's agency National Oceanic and Atmospheric Administration (NOAA).

Impact of marine heat waves on ocean life

- Although an increase of 3 or 4 degrees Celsius in average temperatures may not be much for humans, it can be catastrophic for marine life. For instance, will cause some "devastating" fish kills — the sudden and unexpected death of many fish or other aquatic animals
- A different study revealed that the same MHWs destroyed **kelp forests** and fundamentally altered the ecosystem of the coast. Kleps usually grow in cooler waters, providing habitat and food for many marine animals.
- Another example is when high ocean temperatures in the tropical Atlantic and Caribbean in 2005 led to a massive coral bleaching event. Corals are very sensitive to the temperature of the water in which they live. When water gets too warm, they expel the algae known as zooxanthellae, living in their tissues, causing them to turn entirely white. This is called coral bleaching.
- Coral bleaching has severe consequences as it reduces the reproductivity of corals and makes them more vulnerable to fatal diseases. Not only this, thousands of marine animals depend on coral reefs for survival and damage to corals could, in turn, threaten their existence.

Marine heat waves affect humans

Higher ocean temperatures, which are associated with MHWs, can make storms like hurricanes and tropical cyclones stronger. With warmer temperatures, the rate of evaporation escalates and so does the transfer of heat from the oceans to the air. When storms travel across hot oceans, they gather more water vapour and heat. This results in more powerful winds, heavier rainfall and more flooding when storms reach the land — meaning heightened devastation for humans.

Woman, 76, Mauled To Death By Tiger In Pauri

Kalagarh Tiger Reserve (KTR)

- **Location**: It is located in the **Nainital district of Uttarakhand.**
- When **Jim Corbett Park was established in 1974**, the **northern region** of the park was **renamed Kalagarh Tiger Reserve.**
- It is **named after the Kalagarh dam**, which was **constructed on the Ramganga River**.
- KTR is spread over an area of 301.18 sq. km. which **also includes Sonanadi**

Wildlife Sanctuary, along with Jim Corbett Park.

- **Terrain**: The reserve is located in the **foothills of the Himalayas**, and the terrain is **varied, with forests, grasslands, and hills.**
- **Flora**: It is home to several species of trees, such **as sal, sheesham, semal, bakli, haladu, tun, sain, fig, bamboo**, etc along with **medicinal plants**.
- **Fauna**:
    - It has a high density of **tigers, leopards, elephants** and others from the **cat's family.**
    - It carries a lustrous breed of **deer -chital, barking deer, goral, sambar**, and hog deer.
    - The park has more than **580 species of birds**, which include **kingfishers, wagtails,** forktails, pheasants, hornbills etc.

Ramganga River

- It is a **tributary of the Ganges** River in India.
- **Origin**: It originates in the **Garhwal Himalayas in Uttarakhand** state.
- **Length**: The total length of the river from the source to its outfall into the Ganga is **596 km,** and the **entire length lies in Uttarakhand and Uttar Pradesh**.
- It **joins the Ganga on its left bank near Kannauj** in the Fatehgarh district, **Uttar Pradesh.**
- **Tributaries**:
    - It is fed by several major tributaries, including the **Kosi River**, which **joins it near Kalagarh**, **forming the Ramganga Reservoir.**
    - Other significant tributaries include the **Khoh, the Gangan, the Aril, and the Deoha (Gorra) rivers.**

Managing microplastic pollution is important for meeting sustainable development goals in India

As the most populous country in the world with a population of 1.42 billion, India is facing a mammoth challenge of achieving United Nations-mandated sustainable development goals (SDG) by 2030

In India, the demand for water is rising due to rapid population growth, urbanisation and increasing pressure from agriculture, industry and the energy sector.

Like the Anthropocene (human-dominated epoch), many scientists are using a new historical epoch, "The Plasticene", due to the global distribution and abundance of microplastics. As the name suggests, microplastics are everywhere, from terrestrial ecosystems, to freshwater rivers, lakes, ponds, estuaries, seas and oceans, even in Antarctica.

Microplastic pollution especially harmful

- The **durability of plastic**, which implies that plastic can take hundreds to thousands of years to decompose depending on the type of plastic and where it has been dumped.
- In the oceans, plastic pollution **impacts marine life, ocean health, coastal tourism and even human health.**
- Over the past few years, various news reports have shown that **marine animals such as whales, seabirds and turtles unknowingly ingest plastic and often suffocate.**

- For humans, too, marine plastic pollution is harmful if it **reaches the food chain**. For instance, microplastics have been found in **tap water, beer and even salt**.
- One of the first studies to estimate plastic pollution in human ingestion that was published in June 2019 said that an average person eats at least **50,000 particles of microplastic each year**. Consumption of plastic by humans is harmful since several chemicals that are used to produce plastics can be

Measures taken by government:

- India has pledged to **ban all single-use plastics by 2022.**
- All offices of central and state governments and major PSUs have been told to prohibit single-use plastic products.
- India has **banned imports of solid plastic waste**.
- India has passed the Plastic Waste Management Rules, 2016 and introduced the **Extended Producer Responsibility.**

Plastic Waste Management Rules, 2016

- It aims to **increase minimum thickness of plastic carry bags from 40 to 50 microns**.
- Expand the jurisdiction of applicability from the municipal area **to rural areas**, because plastic has reached rural areas also.
- **Extended Producer Responsibility**: To bring in the responsibilities of producers and generators, both in plastic waste management system and to introduce collect back system of plastic waste by the producers/brand owners, as per extended producers responsibility
- **Introduced collection of plastic waste management fee** through pre-registration of the producers, importers of plastic carry bags/multilayered packaging and vendors selling the same for establishing the waste management system
- Promote **use of plastic waste for road construction** as per Indian Road Congress guidelines or energy recovery, or waste to oil etc. for gainful utilization of waste and also address the waste disposal issue.

Way Forward:

The 3R's +E Strategy:

- **Reduce:** To efficiently reduce plastic pollution, there is an evident need of reducing our usage of plastic.
- **Reuse:** Many plastic items can be reused or used for different purposes. Before throwing plastic items, it is important to consider how they can be reused.
- **Recycle:** Plastic recycling consists of collecting plastic waste and reprocessing it into new products, to reduce the amount of plastic in the waste stream.
- **Educate:** Another crucial solution is education in order to increase awareness and behavioral change.

Legal wayout:

- **Law can be framed** and used to tackle plastic pollution and support a circular plastics economy.
- **Policy shifts** can reduce plastic pollution by incentivizing changes in both business and consumer behavior, as well as in plastic design, alternatives and recycling.

- Governments can also **impose taxes** to deter the production or use of single-use plastics, or **offer tax breaks, subsidies and other fiscal incentives to encourage alternatives to single-use plastic products**.
- **Product standards, certifications and labeling requirements can be designed to educate the public on the environmental impacts of plastic**, and on the health and safety hazards involved in their production and use.
- **Extended Producer Responsibility (EPR) programs** can ensure that manufacturers maintain responsibility for single-use plastic products throughout the whole life cycles of those products.

Nations aim to ink deep sea mining regulations by 2025

International Seabed Authority (ISA)

- It is an **international organization established in 1994** to **regulate mining and related activities in the international seabed beyond national jurisdiction**, an area that includes most of the world's oceans.
- The ISA **came into existence upon** the entry into force of the **1982 United Nations Convention on the Law of the Sea (UNCLOS)**, which codified international law regarding territorial waters, sea lanes, and ocean resources.
- **Headquarters: Kingston, Jamaica**
- **Members**: As of May 2023, ISA has 169 Members, including **168 Member States and the European Union.**
- **Functions:**
    - The ISA is responsible for **granting licenses and regulating activities related** to the exploration and exploitation of **mineral resources in the international seabed.**
    - Its ensures that these activities are carried out in a manner that **protects the marine environment and promotes the equitable** and efficient **utilization of resources.**
- **Structure**:
    - The **supreme authority of the ISA is the assembly**, in which **all ISA members are represented.**
    - The assembly **sets general policies, establishes budgets, and elects a 36-member council, which serves as the ISA's executive authority.**
    - The **council approves contracts with private corporations and government entities** for exploration and mining in specified areas of the international seabed.
    - The **council oversees implementation of the seabed provisions of** the UNCLOS and establishes provisional rules and procedures (subject to approval by the assembly) by which the ISA exercises its regulatory authority.
    - The **secretary-general** of the ISA **is nominated by the council** and is **elected by the assembly to a four-year term.**

United Nations Convention on the Law of the Sea (UNCLOS)

- UNCLOS, also called the **Law of the Sea Convention** or the **Law of the Sea Treaty**, is an **international agreement that establishes a legal framework for all marine and maritime activities**.
- It lays down a **comprehensive regime of law and order in the world's**

oceans and seas, establishing rules governing all uses of the oceans and their resources.

- UNCLOS became **effective on 16th November 1982**.
- UNCLOS **covers a wide range of issues, including:**
    - The **definition of maritime zones**, such as the territorial sea, the contiguous zone, the exclusive economic zone, and the continental shelf.
    - The **rights and responsibilities of coastal states** and flag states.
    - The **conservation and management** of marine resources.
    - The **protection of the marine environment**.
    - The **peaceful settlement of disputes.**

High Court directs Goa to notify Mhadei Wildlife Sanctuary and nearby areas as tiger reserve within three months

Mhadei Wildlife Sanctuary

- It is located in the **Northern Part of Goa.**
- There are a number of picturesque waterfalls within the sanctuary boundaries.
- The most prominent are the **Vazra Sakla Falls** and the **Virdi Falls.**
- The cliff face near the Vazra falls is notable for being the nesting grounds of the critically **endangered Long-billed vultures.**
- **Flora:**
    - The sanctuary is thickly forested with **moist deciduous vegetation** and some evergreen species too.
    - The sanctuary is particularly **well-known for its sacred groves** that protect rare and indigenous trees.
- **Fauna:** Indian gaur, Barking deer, Sambar deer, Asian palm civet, small Indian civet, Wild boar, Indian hare etc.
- The sanctuary is a huge attraction for herpetologists since it contains a large variety of snakes including all of the 'big four' of Indian venomous snakes which are the Indian krait, Russell's viper, Saw-scaled viper and Spectacled cobra

International Day for the Conservation of the Mangrove Ecosystem 2023

International Day for the Conservation of the Mangrove Ecosystem:

- It is celebrated every year on **July 26.**
- This International Day was **adopted by** the General Conference of the UN Educational, Scientific and Cultural Organization **(UNESCO) in 2015.**
- **Purpose**: **To raise awareness of the importance of mangrove ecosystems** as "a unique, special and vulnerable ecosystem" and to promote solutions for their sustainable management, conservation and uses.

Mangroves

- Mangroves are unique **coastal ecosystems found in tropical and subtropical regions** around the world.
- They are characterized by **dense, salt-tolerant trees and plants** that **thrive in the intertidal zones**, where land and sea meet.
- They are typically **found in sheltered coastal areas**, **estuaries, lagoons, and tidal flats**, where they play a crucial role in **maintaining the balance of the**

ecosystem.

- **Some common species** of mangrove trees include the **Red Mangrove** (Rhizophora spp.), **Black Mangrove** (Avicennia spp.), **White Mangrove** (Laguncularia racemosa), and the **Buttonwood** (Conocarpus erectus).
- **Features**:
    - **Respiratory or knee roots:**
        - They have specialized adaptations to cope with high salt levels in both the soil and water, such as **unique root systems called "prop roots**" or "**pneumatophores**" that **help with gas exchange in waterlogged soils.**
        - **They project above the mud and have small openings (lenticels) through which air enters,** passing through the soft spongy tissue to the roots beneath the mud.
    - They can **survive extreme weather conditions** and require **low oxygen levels to survive.**
    - They **cannot survive freezing temperatures** and thus are **found mainly in tropical and subtropical latitudes.**
    - Mangrove forests **can store ten times more carbon per hectare than terrestrial forests.**
    - They can s**tore carbon up to 400 per cent faster than land-based tropical rainforests.**
    - Mangroves improve water quality by **filtering pollutants and trapping sediments from the land**, and they reduce coastal erosion.

Mangroves in India:

- India contributes to **nearly half of the total mangrove cover in South Asia**.
- According to the India State of Forest Report, 2021, the mangrove cover in India is **4,992 square km,** which **is 0.15 per cent of the country's total geographical area.**
- **West Bengal has the highest percentage** of mangrove cover in India, mainly **because it has Sundarbans**, the largest mangrove forest in the world. It is **followed by Gujarat and Andaman, and Nicobar Islands.**
- Other states that have mangrove cover are Maharashtra, Odisha, Andhra Pradesh, Tamil Nadu, Goa and Kerala.

Exquisitely preserved fossil forest from late Miocene epoch found in Japan

Miocene epoch

- The Miocene was a long-lasting epoch in which the earth's climate rebounded from the cooling of the Oligocene and there was a marked increase in both global temperatures and the total number of mammal species.
- It is often divided into the **Early Miocene Epoch**(23 million to 16 million years ago), the **Middle Miocene Epoch** (16 million to 11.6 million years ago), and the **Late Miocene Epoch** (11.6 million to 5.3 million years ago).
- **What changes occurred during this period?**
    - **India collided with Asia**, causing a massive upthrust of the Asian continent that created the Tibetan plateau and the Himalayas.
    - As Africa moved northwards to link with Europe, the Tethys Sea, a vast seaway that once existed between the two continents Europe and Africa, disappeared.

- As the Miocene progressed, **the earth began to cool once more**; the climate became more arid and mammalian diversity began to decrease again.
- **Grasslands underwent a major expansion** in the early Miocene and mammalian herbivores, including rhinos, and many artiodactyls, had to evolve a variety of new adaptation to cope with the more open and arid habitats and coarser vegetation.
- Miocene fossils are abundant in Africa, while there are very earlier fossils from that continent.
- The drop in sea levels during the Miocene associated with the growth of polar ice caps led to the first exposure of what is now Florida in the Miocene.
- In **the oceans**, the Miocene was a time of changing circulation patterns, probably due to global cooling.
- Patterns of oceanic nutrient distribution changed, leading to increased productivity in some regions and decreased productivity in others.
- The Miocene was a **time of accelerated evolution among marine plankton and molluscs,** many groups showing increases in biological diversity.

New millipede species discovered

Millipede species

- The newly found species is a **thread Millipede.**
- It is about the length of a paperclip but skinny as pencil lead.
- Its scientific name is **Illacme socal.**
- It is **translucent and sinuous** like a jellyfish tentacle.
- The creature burrows four inches below ground, secretes unusual **chemicals and is blind.**
- It relays on hornlike antennas protruding from its head to find its way.
- These are member of the **arthropod class Diplopoda.**
- They are cylindrical or **slightly flattened invertebrates.**
- The word "millipede" translates to **"a thousand feet**"—but while millipedes have many feet, none of them quite have a thousand.
- Their **bodies are split into a number of segments**, and each segment has two sets of legs that attach to the body's underside.
- **Diet:** It is a **detritivore**, which means that it eats dead **organic matter in the earth** like damp wood pieces, decayed leaves, and other materials that naturally exists in their moist habitat underground.

13 Islands That Will Disappear in the Next 80 Years

Tuvalu

- It was formerly called as **the Ellice Islands.**
- It's an island country in the **west-central Pacific Ocean**, and sits around halfway between Hawaii and Australia.
- **Capital:** Funafuti
- Its **neighbours include Kiribati**, to the north, and Fiji, to the south.
- It is **composed of nine small coral islands** scattered in a chain lying approximately northwest to southeast

- **Language:** The Tuvaluans are Polynesian and they speak **Tuvaluan language** which is closely related to Samoan.
- **Government**
  - The government is a **parliamentary democracy** with a unicameral legislature elected by universal adult suffrage.
  - There are no political parties: the prime minister is chosen by and from the legislature.
  - Tuvalu is a member of the **South Pacific Forum.**
- **Economy**
  - Most people are **subsistence farmers** and are aided by remittances from relatives working overseas.
  - A small quantity of **copra is produced** for export, the sale of stamps accounts for modest earnings, and fees are collected from foreign fishing fleets.
- **Threats**
  - Due to its **low-lying geography**, Tuvalu is at acute risk **from natural disasters,** including rising storm surges, cyclones, and tsunamis.

Wettest May-June in decade hits Kashmir's cherry growers hard

Farmers growing traditional varieties of cherries are facing more brunt of prolonged precipitation than those growing new varieties

- The prolonged cold weather and rains this year have devastated the cherry crop when the harvest period was at its peak in the Kashmir Valley.
- Cherry is considered a vital crop for the farmers in the Valley as it provides additional income to them in May-June since all other fruits in Kashmir are harvested in autumn.
- Eight cherry varieties grown in Kashmir include **makhmali, siya, mishri, jaddi, Italy, dabal, vishkan and stela**. Four among eight varieties, mainly mishri, jaddi, makhmali and dabal, have good demand in the market. **Mishri** is considered sweeter than all other varieties.
- The annual production of the stone fruit is around 12,000 metric tonnes, making Jammu and Kashmir the largest cherry producer in India.
- The distressed farmers told this reporter that the rains followed by hailstorms during the harvest season had led to cracks in the fruit and they could not sell their produce.
- Cherry is a delicate crop and extremely sensitive to extreme weather conditions, requiring a moderate temperature for optimal growth. Having a very low shelf life, cherries cannot sustain heavy rains or high temperatures

Cherry Farming:

- Cherries are delicious and nutritious fruits that belong **to the genus Prunus.**
- It is a delicate **crop and extremely sensitive to extreme weather conditions**.
- Having a very low shelf life, cherries cannot sustain heavy rains or high temperatures.
- The **Kashmir Valley** contributes **to 95 per cent of** the total cherry production in India.
- Eight cherry varieties grown in Kashmir include makhmali, siya, mishri, jaddi, Italy, dabal, vishkan and stela.

- **Climate:**
  - It requires **cool weather conditions** with temperatures ranging between 15°C to 25°C during the growing season.
  - They also require a period of winter dormancy with temperatures below 7°C to induce flowering.
- **Soil:** The soil should be well-draining, rich in organic matter, and have a pH between 6.0 to 7.5.
- **Planting:** Cherry trees can be propagated by grafting onto rootstocks. The ideal time for planting is during the winter months from December to February.
- **Intercropping:** Some suitable intercropping crops for cherry cultivation in India include legumes, such as peas and beans, and leafy vegetables, such as spinach and lettuce.
- **Fertilization:** Fertilizers rich in nitrogen, phosphorus, and potassium should be applied in adequate amounts to promote healthy growth and fruit development.
- **Harvesting:** Cherries can be harvested when they reach maturity, usually in **late May to early June.**
- **Area of Cultivation:** They are primarily grown in the northern regions of India, particularly in the **states of Jammu and Kashmir, Himachal Pradesh, and Uttarakhand.**

Melting of Ladakh glacier could form three glacial lakes: Study

- Accelerated melting of the Himalayan **Parkachik Glacier** in Ladakh could give rise to three glacial lakes with an average depth ranging between 34 and 84 metres, scientists have found.
- These lakes could be a potential source of glacial lake outburst floods in the Himalayas
- Parkachik Glacier is one of the largest glacier in the Suru River valley, which is a part of the Southern Zanskar Ranges, western Himalaya. The Zanskar Range, part of the Himalayas, lies in the union territory of Ladakh.
- The glacier's yearly melting rate was 6 times faster between 1999 and 2021 (22 years) than that calculated from 1971 to 1999 (28 years), the scientists found using satellite data to determine its glacial retreat from 1971-2021. The findings are published in the journal Annals of Glaciology.
- Faster glacial retreat, along with surface morphological changes, have been known to result in the forming of new glacial lakes and expansion of existing ones, a potential source of glacial lake outburst floods.
- Glacial lakes are formed when a glacier erodes the land and then melts, filling the depression created by the glacier.
- The study's surface ice velocity estimation suggested a slowing down, resulting in an increase of debris cover on the glacier surface, or the ablation zone, it said.

Botanical Survey of India Scientists Discover New Species Of Flower From Sikkim

Pedicularis Revealiana

- It is unique among all **Pedicularis species.**

- It is stout and woody stems, bears minute flowers of pinkish-purple colour.
- It is a **hemiparasitic plant species.**
- Along with making its own food, it has the **ability to gather nutrients** from the roots of trees and plants located nearby.
- This new flora is found in remote forests, which are covered with snow for most of the year.
- This genus includes about 677 species worldwide, of which 82 species, 13 subspecies and nine varieties have been reported so far in India.
- Pendicularis revealiana is the 83rd species reported by the botanists and the plant is commonly known **as a perennial herb.**

Botanical Survey of India

- It is the apex taxonomic research organization of the country which is under the **Ministry of Environment, Forest & Climate Change, Government of India.**
- It was established on 13thFebruary 1890 under the **direction of Sir George King.**
- The mandate of the organization has been broadened to **biosystematics research, floristic studies, documentation, databasing** of National Botanical collection, digitization of herbarium specimens etc.
- Headquarter: Kolkata

Indian Embassy and Consulate General organises LiFE mission event in Nepal

LiFE Mission

- Mission LiFE, or **Lifestyle for Environmen**t, is an **India-led global mass movement to nudge individual and community action to protect and preserve the environment.**
- It was **launched by the Indian Prime Minister at the 26th UN Climate Change Conference of the Parties (COP26) in Glasgow** in November 2021.
- The program hopes to **"mobilize one billion Indians** as well as people in other countries **to become individuals who practice sustainable lifestyles.**
- The global movement will s**howcase sustainable goals and climate actions taken by countries and individuals** around the world.
- It **makes the fight against climate change democratic**, in which everyone can contribute with their respective capacities.
- It **emboldens the spirit of the P3 model, i.e., Pro Planet People.**
- It functions on the **basic principles of 'Lifestyle of the planet, for the planet and by the planet'.**
- It aims at **following a three-pronged strategy for changing people's collective approach** towards sustainability,
    - **nudging individuals to practice simple yet effective environment-friendly actions** in their daily lives (demand)
    - **enabling industries and markets to respond swiftly to the changing demand** (supply)
    - **to influence government and industrial policy to support both sustainable consumption and production** (policy).

Gobardhan portal logs over 1,200 biogas plant registrations since June launch

Gobardhan portal

- It serves as a **centralized repository for assessing investment and participation in the Biogas/CBG (Compressed Biogas) sector** at a pan-India level.
- **Primary objective**: To **streamline the process of setting up CBG/Biogas plants** in the country.
- **It allows any** government, cooperative or private **entity operating or intending to set up a Biogas/CBG/Bio-CNG plant in India to obtain a registration number** by enrolling in the portal.
- This **registration number will enable them to avail a multitude of benefits** and support from the Ministries and Departments of the Government of India.

GOBARdhan Scheme

- **Galvanizing Organic Bio-Agro Resources Dhan** is a crucial umbrella initiative of the Government of India.
- The government launched the Gobardhan scheme in 2018 as a **national priority project under the Swachh Bharat Mission Grameen-Phase II program.**
- **Aim**:
    - To **generate wealth and energy by converting cattle dung, agricultural residue,** and other organic waste **into Biogas, CBG and bio-fertilizers.**
    - It **adopts a whole-of-government approach** and aims to **convert waste into wealth,** thereby **promoting a circular economy.**
- N**odal Ministry:** The Department of Drinking Water and Sanitation, **Ministry of Jal Shakti.**

Telangana's tiger conservation efforts 'very good', finds MEE

Kawal Tiger Reserve

- **Location**:
    - It is located in North Eastern part of **Telangana**(Old Adilabad district), with the **Godavari River on one side** and the **Maharashtra border on the other.**
    - It forms **part of the Deccan peninsula-central highlands.**
- **Rivers**: The reserve is the **catchment for** the rivers **Godavari and Kadam**, which flow towards the south of the sanctuary.
- **Corridor**: It **has connectivity to the Tadoba-Andhari Tiger Reserve of Maharashtra** in the North **and to the Indravati tiger reserve of Chhattisgar**h towards its North-Eastern side.
- **Habitat**: It has diverse habitats comprising of **dense forests, grasslands, open areas, rivers, streams and water bodies.**
- **Vegetation**: **Southern Tropical Dry Deciduous Forest.**
- **Flora**:
    - **Teak is found extensively along with Bamboo.**
    - As many as 673 plant species have been recorded, and the important ones are **Anogeissus latifolia, Mitragyna parviflora,** Terminalia crenulata, Terminalia arjuna, Boswellia serrata etc.
- **Fauna**:
    - It has a faunal diversity which is **typical of the Deccan Plateau.**
    - The major wild animals include: n**ilgai, chousinga, chinkara, black**

buck, sambar, spotted deer, wild dog, wolf, jackal, fox, tiger, leopard, and the jungle cat.

Amrabad Tiger Reserve

- **Location**: It is located in the Nagarkurnool and Nalgonda districts in the **southern part of Telangana.**
- It was notified as a sanctuary in 1983, and after the State bifurcation, it was **declared as Amarabad Tiger Reserve in 2015.**
- ATR **covers a part of the Nallamala Forest** and is home to a variety of flora and fauna.
- The **hilly terrain** of this Tiger Reserve, with **deep valleys and gorges**, **forms the catchment of the Krishna River.**
- **Flora**:
    - **Dense grass occurs in 30% of the area** and is scattered in an additional 20%.
    - Dominant tree species include T**erminalia tomentosa, Hardwickia binata,** Madhuca latifolia. Diospyros melanoxylon, Gardenia latifolia etc.
- *Fauna:*
    - Major wild animals found are **Tiger, Leopard, Wild dog, Indian Wolf, Indian fox,** Rusty-spotted cat, Small Indian civet, Sloth bear, Honeybadger, Wild boar etc.
    - **Over 303 bird species** have been identified in this region. Some important groups include Eagles, Pigeons, Doves, Cuckoos, Woodpeckers, Drongos etc.

Andhra Pradesh: Carcass of blue whale washes ashore at Meghavaram beach in Srikakulam district

Blue whale

- Blue whales are the **largest animals ever to live** on our planet.
- Whales are at **the top of the food chain** and have an important role in the overall health of the marine environment.
- **Habitat:** They are found **in all oceans except the Arctic Ocean**.
- They generally migrate seasonally between summer feeding grounds and winter breeding grounds
- **Lifespan:** The average lifespan is estimated at around 80 to 90 years. Scientists can estimate the age of whales by **counting the layers of wax-like earplugs** collected from deceased animals.
- **Behaviour and Diet**
    - They sometimes swim in small groups but are **more often found alone or in pairs.**
    - They generally spend summers feeding in polar waters and undertake lengthy migrations towards the equatorial waters as winter arrives.
    - The primary diet whale is krill—tiny shrimp-like animals, but fish and copepods (tiny crustaceans) may occasionally be part of the blue whale's diet.
- **IUCN:** Endangered

Ladakh glacier melting may form three lakes, says study

- The Parkachik glacier is one of the largest glaciers in **the Suru River valley**, covering an area of 53 square km and is 14 km long.
- The Suru River valley is a part of the **southern Zanskar Ranges** in the western Himalayas.
- There are two main reasons for the rapid melting of the glacier.
    - The first is **global warming** and increasing temperatures in the region.
    - The second is that it is at a **lower altitude than other glaciers** in the Zanskar region.

Zanskar Ranges

- Zanskar is a high altitude semi-desert lying on the **Northern flank of the Great Himalayan Range.**
- This mountain range acts as a climatic barrier protecting Ladakh and Zanskar from most of the monsoon, resulting in a pleasantly warm and dry climate in the summer.
- **Flora:** Much of Zanskar's vegetation is found in the lower reaches of the valleys, and consists of **alpine and tundra species.**
- **Fauna:** Among the wildlife that can be found in Zanskar are the marmot, bear, wolf, snow leopard, kiang, bharal, alpine Ibex, wild sheep and goats, and the lammergeier.

CAQM announces revision of the Graded Response Action Plan (GRAP) to further strengthen measures to combat sudden/ anticipated deterioration of air quality in NCR during winter months

Graded Response Action Plan:

- It is a set of emergency measures that kick in to **prevent further deterioration of air quality** once it reaches a certain threshold in **the Delhi-NCR region.**
- The GRAP was first notified in January 2017 by the Ministry of Environment, Forest and Climate Change.
- **Implementation:**
    - The Commission **for Air Quality Management (CAQM)** has constituted a sub-committee for the operationalization of the GRAP.
    - This body includes officials from the CAQM, member secretaries of pollution control boards of **Uttar Pradesh, Delhi, Haryana, Rajasthan**, the Central Pollution Control Board, a scientist from the IMD and one from the IITM and Health Advisor.
    - The sub-committee is required to meet frequently to issue orders to invoke the GRAP.
    - The **orders and directions of the CAQM will prevail** in case of any conflict between directions issued by the State governments and the CAQM.

Revised measures

- **Stage I – 'Poor' Air Quality** (AQI ranging between 201-300): Enforce NGT / Hon'ble SC's order on over aged diesel / petrol vehicles.
- **Stage II - 'Very Poor'** (AQI 301-400): Rigorous actions to combat air pollution at identified hotspots in the region.
- **Stage III - 'Severe'** (AQI 401-450): Impose strict restrictions **on BS III petrol and BS IV** diesel four-wheelers in certain areas and may suspend physical

classes in schools for primary grade children up to Class 5.

- **Stage IV - 'Severe Plus'** (AQI greater than 450) : When the AQI exceeds 450, four-wheelers registered outside Delhi, except for electric vehicles, CNG vehicles, and BS-VI diesel vehicles, will not be allowed to enter the city.

Headless decomposed carcass of tiger found in Satpura reserve's core area; MP officials confirm poaching

- It is located in the **Hoshangabad district of Madhya Pradesh**.
- It is located in the **Satpura ranges of the Central Indian Landscape**.
- It lies **south of the river Narmada**.
- Satpura, basically **meaning "Seven Folds",** forms a **watershed between Narmada and Tapti Rivers.**
- **Corridor**: It has corridor connectivity **with Pench National Park.**
- The habitat is also an important **testimony to human evolution** as it **houses more than 50 rock shelters which are almost 1500 to 10,000 years old.**
- **Geological formations include the Deccan trap series, Gondwanas and Metamorphic rocks**.
- **Vegetation**: **Southern tropical moist deciduous forest, Southern tropical dry deciduous** forest, Tropical riparian fringing forest, southern tropical thorn forest, central Indian sun tropical hill forest, Dry and moist grassland.
- **Flora**:
    - It has a variety of flora **typical of the Central Indian Highlands**. These include **teak, bamboo, Indian Ebony, various acacias, wild mango**, Indian gooseberry, satinwood etc.
    - **Twenty-six species of the Himalayan region** and **42 species of Nilgiri** areas are found. Hence STR is **also known as the northern extremity of the Western Ghats.**
- **Fauna**: **Tiger** is the charismatic species along with other mammals like **Gaur, Sambhar, Chital, besides co predators**, birds, reptiles and fishes.

White-rumped vulture faces a perilous future in Nilgris' Sigur plateau

- Despite the protective measures, the future remains extremely perilous for the critically endangered white-rumped vulture (Gyps bengalensis) in the Sigur plateau in the Nilgiris, the last southernmost viable breeding population for the species in India.
- Data from the recent synchronous vulture census in Kerala, Tamil Nadu and Karnataka have shown that the white-rumped vulture population remains roughly in the same range, with very few signs of a significant recovery from the last decade.
- The white-rumped and other vulture species in India have been decimated by the use of diclofenac and a few other Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) in cattle.
- Vultures in Sigur are also becoming the unwitting victims of retaliatory poisoning of tigers and leopards. Mr. Samson's research has also shown that 46 white-rumped vultures died between 2013 and 2017.
- Of them, autopsies could be performed on the carcasses of only eight individuals. It emerged that these eight vultures died after consuming

organophosphorus (insecticides) and urea used to poison carnivores
- Anthropogenic pressures, such as cattle-grazing and poorly designed check-dams, have depleted the habitats over the last few years. Mr. Samson said the species could be wiped out from the region in the next decade unless serious protective measures were taken.
- Due to anthropogenic pressures, one of the three nesting sites of the species in the Mudumalai Tiger Reserve have been abandoned by the vultures, while another prime nesting site at Jagalikadavu has been impacted severely by the check-dams along the Sigurhalla river that have restricted water flow, killing off many **Terminalia arjuna trees** where the vulture nest.

White rumped Vulture
- It is also known as **Gyps Bengalensis**, and is **one of the 9 species of Indian vulture** which are **identified for protection**.
- They are **medium in** size and **called white humped due to** presence of white patch of feathers on the lower back and upper tail.

Habitat and distribution
- They are **generally found in Indian subcontinent** and the regions of **south east Asia** such as Thailand, Laos.
- They are more commonly found in the **Indus valley and along the Himalayas to Assam valley**.
- They are found in **variety of landscapes** including **hilly regions and Plains** near human settlements.

Conservation Status
- They are categorized as **critically endangered** species as per IUCN.
- They are listed under **schedule I** of the **Wildlife (Protection) Act 1972.**

Threat
- Prime reason for decline - **Use of** non-steroidal anti-inflammatory **drugs for cattle treatment – for eg**
- **Habitat degradation and fragmentation**.
- Loss of foraging range.
- Instances of **electrocutions** due to encounter with power lines.

Measures Taken
- Mass **education and awareness programme** are being undertaken for sensitizing about their significance.
- **Involvement of local communities** to report injured vulture to authorities.
- In 2006, **Project Vulture** was launched by Government of India in an effort to save vultures.
- Also various **Vulture Captive Care facility** and **Vulture care centres** have been established.
- There is a **prohibition on manufacture of Diclofenac for animal use**.
- A **National Action Plan (2006) on Vulture Conservation** has been formulated.

Human-wildlife conflict worsens in Nallamala region

Nallamala Forest
- It is one of the largest stretches of **undisturbed forest in South India**, apart from the Western Ghats.
- **Location**:

    - It is spread over five districts in the Indian states of **Andhra Pradesh and Telangana.**
    - It is located in **Nallamala Hills, which is a part of the Eastern Ghats**.
    - It lies **south of the Krishna river**.
- The forest has a **good tiger population**, and a **part of the forest belongs to the Nagarjunsagar-Srisailam Tiger Reserve**, the largest tiger reserve in the country.
- **Climate**:
    - It has a **warm to hot climate throughout the year**, with **summer especially hot and winters mostly cool and dry.**
    - It gets most of its **rain during the South West monsoon.**
- **Vegetation: Tropical dry deciduous.**
- **Flora**: It harbours **endemic species like Andrographis nallamalayana, Eriolaena lushingtonii**, Crotalaria madurensis var, Dicliptera beddomei and premna hamitonii.
- **Fauna**: It is home to as many as 700 species of animals besides **tigers, leopards, such as black buck, wild hog, peacock, pangolin**, Indian Python and King Cobras and several rare bird species.

This new tool can drive India's eco-restoration initiatives

Diversity for Restoration (D4R) tool

- It is developed with information on 237 **socio-economically important native trees** from the Western Ghats.
- It is devised by **Bioversity International.**
- The team from Ashoka Trust for Research in Ecology and the Environment (ATREE), with the help of Bioversity International, modified it to promote restoration programmes in India.

Features

- The researchers have claimed the tool will help improve the **effectiveness of restoration programmes** by providing manifold benefits to interested stakeholders while promoting sustainable development.
- The online tool precisely aims to **help better decision-making** and bring the best outcome for those plantation programmes.
- It could improve socio-ecological perspectives and help stakeholders in decision-making.
- The tool helps the user in **identifying species** that match their restoration objectives.
- It further helps identify species that can resist local stresses and adapt to evolving environmental conditions.
- It also helps pinpoint areas and regions to procure the seeds for the required species.
- The tool has **information about 100 plant functional** traits that have been considered to offer the best possible solution.
- Functional traits include information on economic and ecological uses from the tree species chosen for plantation.
- The tool informs the user whether the tree species offers timber, fruit, manure or other commercial benefits.
- It also informs if the **tree is resilient to physiological stresses** such as

extreme high or low temperatures, salinity or acidity tolerance in the soil among others.
- The tool could also identify windbreakers - the trees can act as a barrier against high winds.
- The user can also know if the species offers better nitrogen fixing and whether it serves as a good pollinator for birds and bees.
- This tool is already being used in countries such as Malaysia, Ethiopia, Columbia, Peru, Burkina Faso, Cameroon etc.

Third active Octopus nursery found beneath waves of Costa Rica.

Octopus nursery
- The newly found nursery is almost two miles below the surface of the Pacific Ocean.
- This nursery belongs to the genus of Muusoctopus, and don't have ink sacs - an organ found in most cephalopods.

Octopus
- It is a **marine mollusc** and a member of the class Cephalopoda, more commonly called **cephalopods.**
- Cephalopoda means "head foot" in Greek, and in this class of organisms the head and feet are merged.
- A ring of eight equally-long arms surrounds the head. They use their arms to "walk" on seafloor.
- The undersides of the arms are **covered with suction cups** that are very sensitive to touch and taste.
- The sack-like body is perched atop the head, which has two complex and sensitive eyes, while the mouth is on the underside.
- They have **three functioning hearts.**
- Two of the hearts work exclusively to move blood to the gills, while the third pumps blood through the rest of the body.
- Their blood is **copper-based** which is more efficient at transporting oxygen at low temperatures and makes **their blood blue in colour.**
- They are **solitary creatures** excellent at camouflaging and concealing themselves.
- They are about 90 percent muscle, and because they lack bones, they can fit through very small spaces.
- Their **skin** contains cells **called chromatophores** that allow the octopus to change colour and pattern.
- They are found in every ocean of the world.

Wildlife Bureau issues 'red alert' against poachers, hunters in all tiger reserves

Wildlife Crime Control Bureau
- It is a statutory **multi-disciplinary body** established by the Government of India to combat organized wildlife crime in the country.
- It was constituted by amending **the Wild Life (Protection) Act, 1972.**
- **Nodal Ministry:** The Ministry of Environment and Forests.
- **Headquarter:** New Delhi
- **Mandate:** Under the Wild Life (Protection) Act, 1972it is mandated to
    - To **collect and collate** intelligence related to organized wildlife crime

activities and to disseminate the same to State and other enforcement agencies for immediate action so as to apprehend the criminals.
    - To establish a **centralized wildlife crime data bank.**
    - To assist foreign authorities and international organization concerned to facilitate co-ordination and universal action for wildlife crime control.
    - In **capacity building of the wildlife crime enforcement** agencies for scientific and professional investigation into wildlife crimes and assist State Governments to ensure success in prosecutions related to wildlife crimes;
    - It advises the Government of India on issues relating to wildlife crimes having national and international ramifications, relevant policy and laws.
    - It also assists and advises the Customs authorities in inspection of the consignments of flora & fauna as per the provisions of **Wild Life Protection Act, CITES and EXIM Policy governing** such an item.
- It has developed an online **Wildlife Crime Database Management System** to get real time data in order to help analyse trends in crime and devise effective measures to prevent and detect wildlife crimes across India.
- This system has been successfully used to analyse trends, helping put in preventive measures as well as for successfully carrying out operations such as **Operation SAVE KURMA, THUNDERBIRD, WILDNET, LESKNOW, BIRBIL, THUNDERSTORM, LESKNOW-II**

Himalayan glaciers face dire straits if global warming not controlled

A new study says water security for nearly 2 billion people living downstream from the Hindu Kush Himalayan ranges is under severe threat.

- Glaciers are melting at unprecedented rates across the Hindu Kush Himalayan mountain ranges and could lose up to 80 per cent of their volume by 2100 if greenhouse gas emissions are not sharply reduced, according to a report.
- Development warned that flash floods and avalanches would grow more likely in coming years, and that the availability of fresh water could be curtailed for nearly two billion people who live downstream of 12 rivers that originate in the mountains.

Cryosphere worst affected

- Various earlier reports have found that the **cryosphere**—regions on Earth covered by snow and ice—are among the worst affected by climate change. Recent research found that Mt Everest's glaciers, for example, have lost 2,000 years of ice in just the past 30 years.

Paris Agreement on Climate Change

- It is a **legally binding global agreement** under the **United Nations Framework Convention on Climate Change (UNFCCC)** that was adopted in 2015. It was adopted in UNFCCC COP21.
- It aims to combat climate change and limit global warming to well below 2o C above pre-industrial levels, with an ambition to limit warming to 1.5o C.
- It replaced the **Kyoto Protocol** which was an earlier agreement to deal with climate change.

- The Paris Agreement sets out a framework for countries to work together to **reduce greenhouse gas emissions, adapt to the impacts of climate change,** and **provide support to developing countries** in their efforts to address climate change.
- Under the Paris Agreement, each country is required to submit and update their **NDCs every 5 years,** outlining their plans for reducing greenhouse gas emissions and adapting to climate change.
    - NDCs are pledges made by countries to reduce their greenhouse gas emissions and to adapt to the impacts of climate change.

Can Switzerland's net-zero climate law help save its Alpine glaciers

Prior to the referendum, the Swiss parliament had earlier passed the law that also requires the country to become carbon neutral by 2050.

Alpine glaciers melting fast

Backers of the plan argue that Switzerland will be hard-hit by climate change and is already seeing the effects of rising temperatures in the Alps.

Swiss glaciers experienced record melting in 2022, losing more than 6 per cent of their volume and alarming scientists who say a loss of 2 per cent would once have been considered extreme.

- **Alps:**
    - The Alps **emerged during the Alpine orogeny** (mountain-building event), an event that began about **65 million years** ago as the **Mesozoic Era** was drawing to a close.
    - Alps are **young fold mountains** with rugged relief and high conical peaks.
    - They are the **most prominent of western Europe's physiographic regions.** Some **750 miles long** and more than **125 miles wide** at their broadest point between Garmisch-Partenkirchen, Germany, and Verona, Italy, the **Alps cover more than 80,000 square miles.**
    - The Alps extend north **from the subtropical Mediterranean coast** near Nice, France, **to Lake Geneva before trending east-northeast to Vienna,** Austria. There they touch the **Danube River** and meld with the adjacent plain.
    - Because of their **arclike shape,** the Alps **separate the marine west-coast climates** of Europe **from the Mediterranean areas** of France, Italy, and the **Balkan region.**
    - **Countries Covered:**
        - The Alps form part of **France, Italy, Switzerland, Germany, Austria, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Serbia, and Albania.**
        - Only **Switzerland and Austria** can be considered **true Alpine countries.**
    - **Important Peaks:**
        - **Mont Blanc** is the highest peak in the Alps and in Europe, reaching a lofty 4,804 meters above sea level. It is located in the Graian Alps and lies within France, Switzerland, and Italy.
        - **Monte Rosa** is a massif (a compact group of mountains) consisting of several peaks. The highest peak in this range

(Dufourspitze) has an elevation of 4,634 meters, claiming the title of **Switzerland's highest peak.**

- **Dom,** which is located near Monte Rosa, Dom stands at **4,545 meters** and is known as one of the "easier" tall peaks in the Alps to summit because of it's **straightforward routes.**
- Other major peaks are Liskamm, Weisshorn, Matterhorn, Dent Blanche, Grand Combin etc.

Impact of climate change on Kashmir's mushroom pickers

Unpredictable weather patterns, early springs, and above-average temperatures have left gucchi mushroom hunters in distress, facing another season of low yield for the second consecutive year

- When the Celsius hits 15 to 20 degrees in the daytime, it's the perfect time of year for "gucchi" to start springing up in the Himalayas of Jammu and Kashmir. Soil temperatures warm, and competition to find the tasty, coveted fungi heats up.
- The gucchi mushroom, the local name for **morel,** truffle-like fungi can fetch prices upward of Rs 40,000 a kg due to their scarcity and short growing season. So, in the world of morels, much like in fishing and game hunting, the whereabouts of fruitful caches are kept secret.
- The vast majority of each yearly crop is collected in the wild – mostly in the mountains of **Ramban**, **Kupwara** and **Anantnag** districts. But where exactly those wild mushrooms will pop up is largely a guessing game.

High morel ground

- Gucchi mushrooms are difficult to spot on the wooded floor and often blend perfectly with their surroundings. But their spongy and honeycomb-looking top gives them a distinctive appearance.
- Ideal weather conditions for the great morel are when daytime Celsius is between 15 and 20 and night-time temperatures are in the five to nine. They can normally be found on **southerly slopes and sunny areas** before showing up on the northern side of hills or in the shade.
- Gucchis can vary in colour from **blonde to dark black**, and sometimes the best way to spot them is by kneeling, crouching or changing the perspective.

Under the weather

- Gucchis are weather dependent, triggered by the temp and moisture. The past few years have been bad for pickers of morel mushrooms in Jammu and Kashmir.
- According to experts, gucchi is becoming rarer because of climate change, deforestation, and habitat destruction. The Jammu and Kashmir forest department data shows morel mushroom production has shrunk from 2,000 quintals in 1991 to around 45 quintals in 2021.
- As there's nobody to pick them then, the second-best fungi in the world – second only to the truffle – and one of the most expensive mushrooms in the world go to waste in the jungles.

Poaching biggest threat to sturgeon species in Danube; 337 illegal activities in 7 years: Report

Poaching of sturgeons is rampant in the Lower Danube and poses a threat to the

existence of the four endangered fish species of the family in the waterbody, according to a new report.

- Danube is the **second longest river in Europe after the Volga.** It **rises in the Black Forest mountains of western Germany** and flows for some 2,850 km to its mouth on the **Black Sea.**

Sturgeons

- Sturgeons have **existed since the time of dinosaurs,** for about **200 million years.** Some of the species can grow up to **eight metre in length and live more than a century.**
- They are called **'living fossils'** because their appearance has altered very little over the years.
    - **Living Fossil** is an organism that has **remained unchanged from earlier geologic times** and whose close relatives are usually extinct.
    - Other than Sturgeons, **Horseshoe crab** and ginkgo trees are examples of living fossils.
- Because the sturgeons live for so many years, mature late and spawn with long intervals, they take a long time to recover from environmental and human pressures, according to WWF. This makes them **great indicators for the health of the river and other ecological parameters.**
- *Habitat:*
    - There are **27 species of sturgeons** and paddlefishes distributed across the Northern hemisphere. While **some species inhabit only freshwater,** most species are anadromous, spawning in freshwater but spending much of their life history in marine or brackish environments.
    - Danube sturgeons live mostly in the **Black Sea,** migrating up the Danube and other major rivers to spawn.
- *Threats:*
    - **Over-exploitation and poaching** (exacerbated by poor fishery management and insufficient legal enforcement of fishing bans).
    - **Blocked migration routes** through dams.
    - Loss or **degradation of habitats.**
    - **Pollution.**
- *Protection Status:*
    - **IUCN Red list:** There are **6 species of sturgeon in the Danube River.** Five of them are now listed as **critically endangered.**
    - **CITES: Appendix-II.**

Ambergris worth Rs 4 crore found in dead whale: What is this rare substance, how it's used

Ambergris, which means grey amber in French, is a waxy substance that originates from the digestive system of protected sperm whales.

Days after the carcass of a sperm whale washed up on a shore of the Canary Island of La Palma, found ambergris, also known as 'floating gold', stuck in its colon, which is estimated to be worth about €500,000 (Rs 4,47,62,500).

What is ambergris?

- Ambergris, which means grey amber in French, is a waxy substance that originates from the digestive system of protected sperm whales.

- While it is incorrectly referred to as 'whale vomit,' one of the theories about its formation suggests that it is produced in the **gastrointestinal tract** of some **sperm whales** for the passage of hard, sharp objects that are ingested when the whale eats large quantities of marine animals.
- The ambergris is said to be passed like faeces and has a very strong faecal odour combined with a strong marine odour. The freshly passed ambergris is a light yellowish substance and is fatty but as it ages it turns waxy and gets red-brownish, sometimes with shades of grey and black in colour and attains a mild, earthy, sweet smell but still with notes of mild marine odour.

What are the uses of ambergris and why is it so expensive?

Traditionally, it is used to produce perfumes which have **notes of musk**. While there are records of it being used to **flavour food, alcoholic beverages** and **tobacco** in some cultures in the past, it is rarely used for these purposes presently.

Legalities in India

- While there is a ban on the possession and trade of ambergris in countries like the **USA, Australia and India**, in several other countries it is a tradable commodity, though with limitations in some of them.
- In the Indian context, sperm whales are a protected species under **Schedule 2 of the Wildlife Protection Act** and possession or trade of any of its by-products, including Ambergris and its byproducts, is illegal under provisions of the **Wildlife Protection Act, 1972.**

Scientist discover extremely rare "leopard-print' frog

- **Scientific Name:** Leptodactylus laticeps
- It is an extremely rare species found **only in South American countries namely Argentina, Bolivia and Paraguay.**
- **Threat:** The frog is under threat as its habitat the Dry Chaco is cut down.
- **Conservation status**
  - **IUCN:** Near Threatened

Grana Chaco

- It is lowland **alluvial plain**in interior **south-central South America.**
- It is bounded on the **west by the Andes mountain** ranges and on the **east by the Paraguay and Paraná rivers.**
- **Physiography:** It is a vast **geosyncline basin** formed by subsidence (or down warping) of the area between the Andean cordilleras on the west and the Brazilian Highlands on the east as it filled with alluvial debris from these two features.
- **Climate:** It is subject to climates that vary **from tropical in the north to warm-temperate in the south.**
- The Grana Chaco is a large expanse of forest and dusty plains straddling parts of **Bolivia, Argentina, and Paraguay.**

Century-old mystery behind Antarctica's Blood Falls finally SOLVED

Taylor Glacier

- It was first discovered in 1911 by a British expedition to the continent.
- The crimson drool is **known as Blood Falls.**
- The red waterfall is located in **the McMurdo Dry Valleys** region of Antarctica.
- Scientists analysed the contents using powerful electron microscopes and

revealed that there were little **nanospheres and they were iron-rich.**
- The minuscule particles **come from ancient microbes** and are a hundredth of the size of human red blood cells.
- They are highly abundant in the meltwaters of Taylor Glacier, which was named after the British scientist Thomas Griffith Taylor who first noticed the Blood Falls on the 1910 to 1913 expedition.
- Along with iron, the nanospheres also **contain silicon, calcium, aluminium, and sodium.**

Antarctica
- It is the world's **southernmost and fifth largest continent**. Its landmass is almost wholly covered by a vast ice sheet.
- It has an extremely cold, dry climate. Winter temperatures along Antarctica's coast generally range from -10° to -30°C (14° to -22°F).
- **Lichens, mosses, and terrestrial algae**are among the few species of vegetation that grow in Antarctica.
- The **islands** of the Antarctic region are: **South Orkney Islands, South Shetland Islands, South Georgia**

First recorded sighting of Indian Grey Hornbill in Puducherry

Indian Grey hornbill
- It is a common hornbill found on the **Indian subcontinent.**
- It is commonly sighted in pairs.
- These birds are **known to be arboreal,**e., spend most of their time on tall trees, but may descend for food and to collect mud pellets for nesting.
- **Appearance:**
  - It has grey feathers all over the body with a light grey or dull white belly.
  - The horn is black or dark grey with **a casque extending to the point** of curvature of the horn.
  - Unlike a lot of other birds, the **male and female look similar**
- It is one of the few hornbill species **found in urban areas in many cities** where they are able to make use of large trees in avenues.
- They play an essential role in the ecosystem as **prime dispersers of seeds.**
- **Distribution:** Indian subcontinent; found from north-east Pakistan and south Nepal east to north-west Bangladesh and south throughout most of India except in Assam.
- **Conservation status**
  - **IUCN:** Least Concern

Skewed rainfall distribution drowning north, northwestern India while peninsular south remains dry

The India Meteorological Department categorised monsoon rainfall in the country as 'normal' as of July 10, 2023. However, 15 subdivisions in the eastern and southern peninsula have deficit rainfall.
- The July downpour that hit the northern regions of the country on July 8 and 9 highlighted the large to large excess anomalous distribution of monsoon 2023 reported till now. A combination of factors have led to this anomaly.
- In June 2023, **Cyclone Biparjoy** led to the western and northwestern regions

of the country experiencing excess to large excess rainfall while eastern and southern India remained dry due **weak monsoonal rain**.

- By July, a marine heatwave brewing in Bay of Bengal pumped enough moisture to the monsoon depression or low pressure area, which moved toward the northwestern regions of the country instead of going in the north-central direction.
- In a rare occurrence, this **low pressure system interacted with a western disturbance** to produce extreme rainfall that the northern states witnessed on July 8 and 9, 2023.
- A **western disturbance** is an extratropical storm originating in the Mediterranean region and which normally brings sudden rainfall in the northwestern parts of the subcontinent, usually during the winters.
- Taking stock of all the meteorological and climatic events, 2023 has been reporting a lot of aberrations, starting with the drier western regions of the country — Gujarat and Rajasthan — having reported excess rain in June.

Kharif crops take a severe hit by intense and unprecedented rainfall across India

- A delayed southwest monsoon had earlier impacted Kharif season crops with low soil moisture. Record-breaking, heavy to extremely heavy rainfall in different regions, especially in the northwestern states of Himachal Pradesh, Uttarakhand, Punjab, Haryana and Uttar Pradesh, has now dealt a crushing blow by inundating the fields of already sown crops.
- The India Meteorological Department (IMD) has advised farmers to drain out excess water from their fields so that standing crops are saved from rotting. It has also asked to postpone the sowing or transplanting of paddy and sowing of other Kharif crops like maize and pulses in at least 11 states and Union territories.
- **Maize and cotton** crops seem to have been affected the most, with farmers staring at heavy losses.

Maize

- The predominant maize growing states that contributes more than 80 % of the total maize production are:
- Andhra Pradesh (20.9 %) > Karnataka (16.5 %) > Rajasthan (9.9 %) > Maharashtra (9.1 %) > Bihar (8.9 %) > Uttar Pradesh (6.1 %) > Madhya Pradesh (5.7 %) > Himachal Pradesh (4.4 %)
- **Temperature:**Between 21-27°C
- **Rainfall:**High rainfall.
- **Soil Type:**Old alluvial soil.
- Maize is used both as **food and fodder.**
- The **United States of America (USA) is the largest producer of maize** contributes nearly 36% of the total production in the world.
- India is the **seventh largest producer of Maize**representing around 4% of world maize area and 2% of total production.

Cotton Crop

- It is a Kharif Crop that comes from the natural fibres of cotton plants, which are native to tropical and subtropical regions.
- The top five cotton producing countries are **China, India, the United States**

of America, Brazil and Pakistan, which together account for more than three-quarters of global production.

- Being renewable and biodegradable, cotton is the most environmentally friendly raw material for the textile industry as compared to its synthetic alternatives.
- Cotton plants have a large growing period which can extend up to 200 days. **Growing cotton starts between December and March.** These plants require a **relatively high temperature (21-30°C) over a long growing season**.
- The **cotton is not a thirsty crop as it is a xerophyte**, which can grow in dry, arid environments.

Cotton production in India:

- India is the **largest producer of cotton in the world and the third largest exporter**. It is also the **largest consumer of cotton in the world**.
- Top Cotton Producing States in India are **Gujarat, Maharashtra. Telangana, Andhra Pradesh.**
- India is the country to grow all four species of cultivated cotton G.arboreum and Herbaceum (Asian cotton), G.barbadense (Egyptian cotton) and G. hirsutum (American Upland cotton).
- hirsutum represents 94% of the hybrid cotton production in India and all the current Bt cotton hybrids are G. hirsutum.
- Now India's Cotton would be known as **'Kasturi Cotton'** in the world cotton Trade.
- The **pest-resistant Genetically Modified (GM) Bt cotton** hybrids have captured the Indian market (covering over 95% of the area under cotton) since their introduction in 2002.
- These now cover over 95% of the area under cotton, with the seeds produced entirely by the private sector.
- India is the only country that grows cotton as hybrids and the first to develop hybrid cotton back in 1970.

Massive Strange Shelf Cloud Appears In Uttarakhand's Haridwar Amid

Shelf Cloud

- A "shelf cloud" or **"Arcus cloud"** generally **forms along the leading edge of thunderstorms.**
- It is a **type of low-lying, horizontal cloud formation** characterized by a **clearly defined line of solid clouds.**
- It is **known for its distinctive wedge-shaped formation**. They usually **appear as a broad arc across the sky** that can **sometimes appear to be rotating horizontally.**
- **Formation**:
    - Shelf clouds **form when cold and dense air is forced into a warmer air mass by wind.**
    - This rush of cold air often **occurs in a thunderstorm's downdraught**, where **cold air rushes towards the ground before spreading out to create a gust front.**
    - Shelf clouds produced by thunderstorms are always **preceded by a rush of dry and cold air ahead of the cloud, with rain arriving after** the shelf cloud has passed overhead.

- **Formation of Thunderstrom**
  - Thunderstorms **form when warm, moist air rises into cold air.**
  - The **warm air becomes cooler, which causes moisture, called water vapor, to form small water droplets — a process called condensation.**
  - The **cooled air drops lower in the atmosphere, warms, and rises again**.
  - **This circuit** of rising and falling air **is called a convection cell.**
  - If this happens a small amount, a cloud will form. **If this happens with large amounts of air and moisture, a thunderstorm can form.**

T.N. Forest Department steps up vigil around Mukurthi National Park in Nilgiris to curb poaching

Mukurthi National Park

- **Location**:
  - It lies in the **western corner of Nilgiris Plateau in** the state of **Tamil Nadu.**
  - The park is a **part of the Nilgiri Biosphere Reserve**. It is s**andwiched between** the **Mudumalai National Park** and the **Silent Valley National Park**.
- The area was declared as a wildlife sanctuary in 1982 and **upgraded to a National Park in 1990.**
- It was established with the **prime motive of conserving its keystone species – the Nilgiri Tahr.**
- It is a **UNESCO World Heritage Site** and was **formerly known as Nilgiri Tahr National Park.**
- It is also **home to Mukurthi Peak (2,554m**), the fourth highest peak in the Nilgiri Hills.
- **Rivers**: **Pykara and Kundah rivers** flow through the park along with several perennial streams that originate in the park and drain into the Bhavani Puzha.
- **Vegetation**:
  - The majority of the landscape in the reserve is **covered with shrubs and mountainous grasslands.**
  - **The area** in the National Park which are **at an elevation** and experience high rainfall **are covered with sholas and lush green tropical grasslands.**
- **Flora**:
  - **Along sholas, shrubs like Gaultheria fragrantissima, Helichrysum** and Berberis tinctoria are found.
  - Other plants which can be seen here are **Rhododendrons, Cinnamon, Mahonia, Satyrium**, Raspberries etc.
- **Fauna**: The park houses some of the **endangered wild species like Nilgiri tahr, Indian elephants, Nilgiri Langur**, Bengal tiger and bonnet macaque.

INTERNATIONAL RELATIONS

First ever BIMSTEC Foreign Ministers meeting started in Bangkok, Thailand

Bay of Bengal Initiative for Multi Sectoral Technical and Economic Cooperation (BIMSTEC) Foreign Ministers first ever meeting today started in Bangkok, Thailand.

BIMSTEC

- It is a **regional organization** comprising **seven Member States lying** in the littoral and **adjacent areas of the Bay of Bengal,** constituting a contiguous regional unity.
- It **came into being on 6 June 1997 through the Bangkok Declaration**.
- It **constitutes seven Member States**: **five** deriving **from South Asi**a, including **Bangladesh, Bhutan, India, Nepal, Sri Lanka**, and **two from Southeast Asia**, including **Myanmar and Thailand.**
- **Secretariat**: Permanent Secretariat of BIMSTEC is operational since September 2014 in **Dhaka**.
- **Areas of Cooperation:**
    - There are **14 priority areas** 1) **Counter terrorism** and transnational crime, 2) **Transport & Communication**, 3)**Tourism**, 4) **Environment** and Disaster Management, 5)**Trade and Investment**, 6) Cultural Cooperation, 7) Energy, 8) Agriculture, 9)Poverty Alleviation, 10) Technology, 11) Fisheries, 12) Public Health, 13) People-to-People contact 14) **Climate Change**.
    - **Each country takes lead in specific areas**.
    - **India is the Lead Country in four areas**, viz **Counter-Terrorism** and Transnational Crime, **Transport & Communication**, **Tourism**, and **Environment and Disaster Management**.

Solomon Islands leader hits back at criticism of deepening security ties with China

- Prime Minister of Solomon Islands while in China signed **nine agreements and memorandums, including a police cooperation plan.**
- The new agreements come after the Solomon Islands signed a **security pact with China** last year, raising fears of a military build-up in the region

Solomon Islands

- It is an **island country** consisting of six major islands and over 900 smaller **islands in Oceania.**
- It is situated in the **southwest Pacific Ocean**, approximately 2,000 km to the northeast of Australia.
- **Capital:** Its capital, Honiara which is located on the largest island, Guadalcanal.
- The terrain is mountainous and heavily forested.
- More than 90% of the islanders are **ethnic Melanesians.**
- Once a British protectorate, the Solomon Islands achieved independence as a republic in 1978.
- **Language:**
    - There are 63 distinct languages in the country, with numerous local dialects.
    - English is the official language, but Pijin is the common language for

the majority of people.

EUs new subsidy regulation could hit India's PLI scheme, exports: GTRI

Foreign Subsidies Regulation (FSR)

- The European Union's FSR **entered into force on 12 January 2023.**
- **Aim**: **Combating distortions of competition on the EU** internal market **caused by foreign subsidies.**
- It will **allow EU to investigate financial contributions granted by non-EU governments to companies active in the EU**, and **prohibit the award of public contracts to a company** that has **unduly profited from foreign subsidies.**
- It **imposes mandatory notification and approval requirements** for acquisitions of significant EU businesses and large EU public tenders, and **gives the European Commission (EC) extensive powers to launch ex officio investigations**.
- The **EC is the sole enforcer of the FSR.**
- In cases where the **European Commission finds that a foreign subsidy is distorting** competition, **it can impose various remedies, including**
    - **fines of up to 10% of the company's annual aggregated turnover**;
    - **requiring the company to repay the foreign subsidy** if competition distortion is confirmed;
    - **banning the company from participating in public procurement**;
- **What Counts as Foreign Financial Contributions under the FSR?**
    - FSR **covers financial contribution from non-EU governments to firms operating in/exporting to EU's market.**
    - Such a contribution **may be distortive where it confers a benefit not normally available on the market to a company in the EU**, and that **benefit is specific to one or more companies or industries** as opposed to all companies or all companies active in a particular industry.
    - The contributions **include direct grant, low-interest loan, tax incentives on goods or services at below-market prices**, **and provision of land or buildings** at below-market prices.
    - FSR **applies to transactions above a certain threshold**. **Companies must notify** the European Commission **if their transactions involving foreign subsidies exceed this threshold.**
    - **For mergers and acquisitions, notification is mandatory if the combined value of the merging companies' assets exceeds €500 million**, but not necessary if the value of foreign subsidies is less than €1 million.

Morocco's territorial claims on Western Sahara: A new conflict brewing?

Conflict might intensify in Western Sahara as Algeria and Morroco ramp up their military expenditure.

- The United Nations categorises it as a non-self-governing territory, essentially a remnant of a former colony.
- But it has abundant reserves of **phosphate** — a vital component in fertilizer production, which became a strategically important commodity following the

war in Ukraine.
- The territory also has rich fishing waters along its coastline on the Atlantic Ocean.

Morocco considers Western Sahara an integral part of its territory and has maintained de facto control over most of the region for decades. However, most countries—and the United Nations—have refused to endorse Morocco's claim.
Along with the UN General Assembly, several international courts including the International Court of Justice have ruled that colonisation in Western Sahara is still pending and Morocco's efforts to annex it are illegal.
Israeli Prime Minister officially recognised Morocco's sovereignty over Western Sahara, making Israel the second country (after the United States)
However, there are concerns that the situation in Western Sahara is in fact moving away from "peace and stability", and that the territories might once again become scenes of armed conflict between the Moroccan military, the pro-independence Polisario Front, and neighbouring Algeria.

Ships Sailing To Ukrainian Ports Will Be Seen As 'Carriers Of Military Cargo', Says Rusia

Black Sea

- It is a large **inland sea located in southeastern Europe**.
- **Bordering countries**: It is bordered by **six countries**, **Ukraine** to the north, **Russia** to the northeast, **Georgia** to the east, **Turkey** to the south, **Bulgaria** to the southwest, and **Romania** to the west.
- It is **connected to the Mediterranean Sea through the Bosporus Strait, the Sea of Marmara, and the Dardanelles Strait.**
- It covers an area of approximately **436,000 square kilometres** (168,000 square miles).
- The Black Sea **receives freshwater inflows all around the basin,** but the important ones **(Danube, Dniepr and Dniestr**) discharge into the north-western coastal waters.
- **Limited Oxygen Levels:**
    - The Black Sea's **deeper waters have lower levels of oxygen** due to its unique geological and hydrological conditions.
    - The lack of oxygen in the lower layers **creates a distinct environment**, and it is **one of the world's largest anoxic basins,** meaning it has **areas with very little dissolved oxygen.**
- **Islands**: It contains several islands, with the **largest ones being Snake Island (Ukraine), Giresun Island (Turkey) and St. Ivan Island (Bulgaria).**

Overwhelming response to PM's proposal of making African Union permanent member of G-20

African Union (AU)

- The African Union (AU) is a **continental body** consisting of the **55 member states** that **make up the countries of the African Continent**.
- It was **officially launched in 2002 and replaced** its predecessor, **the Organization of African Unity (OAU)**, which was founded in 1963.
- **Primary Objective**: To p**romote unity, cooperation, and development among African nations** while advancing the continent's interests on the

global stage.

- It **aims to strengthen political, economic, and social integration** among African countries, with a vision of achieving an integrated, prosperous, and peaceful Africa.
- **Headquarters: Addis Ababa, Ethiopia**
- **Structure:**
    - **Assembly**: It is the **highest decision-making body**, consisting of the **heads of state and government** of member countries.
    - **Executive Council: Made up of foreign affairs ministers**, **handles policy matters and makes recommendations to the Assembly**.
    - **AU Commission: Headquartered in Addis Ababa**, is the **administrative arm responsible for implementing the decisions** of the Assembly and the Executive Council.
    - **The Peace and Security Council**: Responsible for **maintaining peace and security** on the continent.
    - The **AU structure promotes the participation of African citizens and civil society through the Pan-African Parliament and** the Economic, Social & Cultural Council (**ECOSOCC**).

President Xi Jinping will attend virtual SCO summit hosted by India: Chinese Foreign Ministry

- SCO is an **intergovernmental organization founded in Shanghai**, China, **on 15 June 2001 by** the leaders of **China, Kazakhstan, Kyrgyzstan, Russia, Tajikistan and Uzbekistan**.
- **Apart from Uzbekistan**, the other **five countries have been a part of the 'Shanghai Five' constituted in 1996** by China to address border security issues with four of its neighbours.
- The cooperation was **renamed SCO after Uzbekistan joined** the organization **in 2001.**
- The **SCO currently comprises eight Member States**: **China, India, Kazakhstan, Kyrgyzstan, Russia, Pakistan, Tajikistan and Uzbekistan.**
- **India and Pakistan** became permanent **members in 2017.**
- **The main objectives** of the SCO are as follows:
    - **Strengthening mutual trust, friendship and neighbourly relations** among the member states;
    - Promoting effective **cooperation in political, trade, economic, scientific, technical, and cultural spheres** as well as in the realm of educational, energy, transport, tourism, environmental protection, and other areas;
    - Jointly **maintaining and safeguarding peace, security and stability** in the region; and
    - **Fostering creation of democratic, fair and rational new international political and economic order.**
- **Structure**:
    - The **Heads of State Council (HSC) is the supreme decision-making body** in the SCO. It **meets once a year and adopts decisions** and guidelines on all important matters of the organisation.
    - The organisation **has two permanent bodies:**

- The **SCO Secretariat based in Beijing**.
- The Executive Committee of the **Regional Anti-Terrorist Structure (RATS) based in Tashkent.**
- RATS serves to promote cooperation of member states against terrorism, separatism and extremism.

- **The official working languages: Chinese and Russian.**

Hamas lets Gaza residents pose with weapons for first time

- The armed wing of Gaza's Islamist rulers Hamas has put its weapons on public display, in a first open event drawing hundreds of Palestinians including children brandishing rocket launchers for selfies.
- Dressed in black balaclavas and tactical camouflage suits, members of the **Ezzedine al-Qassam** Brigades mingled with young men and women at the exhibition in Gaza City's Unknown Soldier's Square. The event was the first at which Hamas has allowed the public to take photos of weapons.
- Among the Hamas weapons on display in Gaza City on Friday were a range of locally manufactured missiles, "**Shihab**" drones, rocket-propelled grenade launchers and Russian-made "**Kornet**" missiles.

Hamas

- Hamas is a Palestinian Islamist political organization and militant group that has waged war on Israel since the group's 1987 founding, most notably through suicide bombings and rocket attacks.
- It seeks to replace Israel with a Palestinian state. It also governs Gaza independently of the Palestinian Authority.

Gaza has been under a tightened Israeli blockade since 2007 in which most basic goods still enter the region under highly restricted measures.

- In May, an Israeli offensive left nearly 260 Palestinians dead and thousands wounded as well as a vast trail of destruction in Gaza. Palestinian resistance groups responded with rocket barrages into Israeli areas, killing at least 13 Israelis.

The Gaza Strip

The **Gaza Strip** is an entirely artificial creation that emerged in 1948 when roughly three-fourths of Palestine's Arab population was displaced, in some cases expelled, during the course of Israel's creation. And most of the refugees, they were sort of scattered across the region in neighboring countries like Jordan, Syria and Lebanon.

- Some went to **the West Bank,** which came under Jordanian rule after 1948. And a very large number went to the Gaza Strip, which is this **tiny little coastal strip between Egypt and what is now Israel.** Today, the population of Gaza, **about 70% of Gaza's population are refugees.**

Hamas forcibly took control over the Gaza Strip in 2007. Shortly thereafter, the Israelis imposed a complete closure on Gaza's borders. They declared Gaza to be an enemy entity. Of course, Gaza is not a state.

- **Hamas,** of course, is viewed by Israel and by much of the international community as a terrorist organization, including the United States, for their history of attacks on civilians and so forth.

Belarusian embassy in Netherlands vandalized

Belarus

- It is a **landlocked country of eastern Europe.**
- **Bordering countries**: It borders **Russia** to the northeast, **Ukraine** to the south, **Poland** to the west, and **Lithuania** and **Latvia** to the northwest.
- The **capital and largest city is Minsk.**
- **Languages**:
    - **Spoken languages are Belarusian (official) 24%, but 70% speak Russian (official).**
    - E**thnic Belarusians, who speak a language closely related to Russian and Ukrainian, make up more than three-quarters of the population.**
- **Relief**:
    - Much of the country consists of **flat lowlands separated by low level-topped hills and uplands.**
    - **About 40% of the country is forested; Białowieża Forest** is one of the last and largest remaining parts of the immense primeval forest that once stretched across the European plain.
- **Rivers**:
    - **The greater part of the republic lies in the basin of the Dnieper**—which flows across Belarus from north to south on **its way to the Black Sea**.
    - The extreme **southwestern corner of Belarus is drained by the Mukhavyets**, a **tributary of the Bug (Buh) River**, which forms part of the border with Poland and flows to the Baltic Sea.
- **Climate**: It has a **cool continental climate moderated by maritime influences** from the Atlantic Ocean.
- Until it became independent in 1991, **Belarus, formerly known as Belorussia or White Russia, was the smallest of the three Slavic republics included in the Soviet Union** (the larger two being Russia and Ukraine).

Iran in the SCO

The case for Iran's full membership of the SCO has been made for several years. Prior to Iran's joining, the SCO consisted of eight member countries: China, Russia, India, Pakistan, and the four Central Asian countries of Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan.

Prime Minister Narendra Modi welcomed Iran as the newest member of the Shanghai Cooperation Organisation (SCO) at the virtual summit

Shanghai Cooperation Organisation

- Prior to Iran's joining, the SCO consisted of eight member countries: China, Russia, India, Pakistan, and the four Central Asian countries of Kazakhstan, Kyrgyzstan, Tajikistan, and Uzbekistan.
- The grouping came into existence in Shanghai in 2001 with six members, (No India and Pakistan)
- Its primary objective was to enhance regional cooperation for efforts to curb terrorism, separatism, and extremism in the Central Asian region.
- **Afghanistan, Belarus, Iran, and Mongolia** enjoy Observer status in the SCO, while six other countries — **Azerbaijan, Armenia, Cambodia, Nepal, Turkey and Sri Lanka** — have Dialogue Partner status.

Iran and the SCO

- The case for Iran's full membership of the SCO has been made for several years.
- In 2016, the year after Iran signed the nuclear deal (called **JCPOA**) with Western powers led by the United States.
- However, the US under President Donald Trump pulled out of the deal in 2018, and the agreement became ineffective. A year later, the US ended all waivers, curbing Iran's oil exports.

ADB Provides $200 Mn Extra Funding For India's Ongoing Urban Development Project

Asian Development Bank (ADB)

- It is a **multilateral development bank established** on 19th December **1966.**
- Its primary mission is to "**foster economic growth and cooperation" among countries in the Asia-Pacific Region**.
- **Functions**:
    - ADB **assists members and partners by providing loans, technical assistance, grants, and equity investments** to promote social and economic development.
    - It also provides **financing to certain private sector projects as well as public-private partnerships**.
    - The ADB regularly **facilitates policy dialogues** and provides **advisory services.**
    - They also **useco-financing operations that tap official, commercial, and export credit sources** while providing assistance.
- **Headquarters: Manila**, Philippines.
- **Members**: From 31 members at its establishment in 1966, ADB has grown to encompass **68 members—of which 49 are from within Asia and the Pacific and 19 outside**.
- **Control**:
    - ADB is **run by a board of governors**, which **represents the member countries** of the ADB.
    - The ADB was **modelled closely on the World Bank** and **has a similar weighted voting system** where **votes are distributed in proportion to members' capital subscriptions**.
    - **As of 2022**, ADB's five **largest shareholders are Japan and the United States (each with 15.6% of total shares), the People's Republic of China (6.4%), India (6.3%), and Australia (5.8**%).
- **Source of Funding**: It relies on **member contributions**, **retained earnings from lending**, and **the repayment of loans** for the funding of the organization.

Why the US says China's amended anti-espionage law puts businesses at risk

The US government's National Counterintelligence and Security Centre (NCSC) has expressed concerns over China's newly amended security law, which came into effect on July 1 and extends the scope of the state's powers.

What does China's newly amended anti-espionage law say?

- The revised law refines the definition of **espionage**, specifying acts such as carrying out cyber attacks against state organs, confidential organs or crucial

information infrastructure as acts of espionage.
- Additionally, it states that targets of espionage would now include all documents, data, materials and articles that concern "national security and interests". This has been interpreted to mean that the government can now demand to look at **private information** of individuals and organisations, citing this law, and documents and such materials can now constitute spying.
- Attempts to illegally obtain or share state secrets, intelligence, or other data, materials, or items related to national security or national interests. Here, the words "or other data, materials, or items related to national security or national interests" are newer additions.
- This has raised alarm bells for corporate 'due diligence' companies, those who carry out risk analysis for doing business with another company or in a particular environment.

What has the US said on this law

According to the NCSC, the law has:
- Potential to create legal risks or uncertainty for foreign companies, journalists, academics, and researchers,
- Any documents, data, materials, or items could be considered relevant to the People's Republic of China's national security due to ambiguities in the law

Similarly, amid a row with Canada in 2018, after its authorities helped arrest a Huawei executive over charges of theft of technology, within two weeks, China arrested two Canadian men on allegations of spying.

INDIA

Official Secrets Act:
- OSA broadly **deals with two aspects — spying** or espionage and **disclosure of secret information** of the government.
    - However, the **OSA does not define the secret information,** the government follows the **Manual of Departmental Security Instructions, 1994** for classifying a document as secret.
    - Generally **secret information includes** any official code, password, sketch, plan, model, article, note, document, or information.
- If guilty, a person may get up to **14 years' imprisonment, a fine, or both**. Both the person communicating the information and the person receiving the information can be punished under the OSA.
- *Background:*
    - OSA has its roots in the British colonial era. The **Indian Official Secrets Act (Act XIV), 1889** was brought in, with the objective of muzzling the voice of a large number of newspapers that had come up in several languages, and were opposing the British policies.
    - The Act XIV was amended and **made more stringent** in the form of The Indian Official Secrets Act, 1904, during Lord Curzon's tenure as Viceroy of India.
    - In 1923, a newer version was notified, the **Indian Official Secrets Act (Act No XIX of 1923)**.
        - It was **extended to all matters of secrecy and confidentiality** in governance in the country.
- *Issues Involved:*
    - **Conflict with Right to Information Act:** It has often been argued that

the OSA is in direct conflict with the **Right to Information (RTI) Act, 2005**.
    - Section 22 of the RTI Act provides for **its primacy vis-a-vis provisions of other laws, including OSA**. So if there is any inconsistency in OSA with regard to furnishing of information, it will be superseded by the RTI Act.
    - However, under **Sections 8 and 9 of the RTI Act,** the government can refuse information. Effectively, if the government classifies a document as secret under OSA, that document can be kept outside the ambit of the RTI Act, and the government can invoke Sections 8 or 9.
- **Misinterpretation of Breach of National Security: Section 5** of OSA, which deals with potential breaches of national security, is **often misinterpreted**.
    - The Section makes it a punishable offence to share information that may help an enemy state.
    - The Section comes in handy for booking journalists when they publicise information that may cause embarrassment to the government or the armed forces.

US says it foiled Iran attempt to seize two oil tankers

Strait of Hormuz

- Strait of Hormuz, also called Strait of Ormuz is a **channel linking the Persian Gulf (west) with the Gulf of Oman and the Arabian Sea.**
- The strait is **35 to 60 miles** (55 to 95 km) **wide and separates Iran (north) from the Arabian Peninsula (south).**
- It contains the **islands of Qeshm (Qishm), Hormuz, and Hengām (Henjām).**
- The Strait of Hormuz is the **world's most important oil chokepoint** because of the **large volumes of oil that flow through the strait.**

Gulf of Oman

- The Gulf of Oman or **Sea of Oman**, also known as the **Gulf of Makran or Sea of Makran**, forms the **only entrance to the Persian Gulf from the Indian Ocean**.
- It **connects the Arabian Sea with the Strait of Hormu**z, which then empties into the Persian Gulf.
- **Bordering Countries**: It is bordered by **Pakistan and Iran in the north**, by **the United Arab Emirates in the west and by Oman in the south.**
- The gulf is **relatively shallow** because of its origin as a fissure in the mountain spine now divided between Iran and Oman.
- The Gulf of Oman is **about 320 km wide at its widest point between Cape al-Hadd in Oman and Gwadar Bay on the Iran-Pakistan border**. It **narrows to 35 miles (56 km) at the Strait of Hormuz.**

Japan protests to S.Korea over military drill on disputed islands

Takeshima Island

- Location: It is situated in the middle **of the Sea of Japan.**
- It is lying almost equidistant between the Korean Peninsula and Japan.
- It is called Dokdo in South Korea and **Takeshima** in Japan.

- It has also been known as the **Liancourt Rocks**, named by French whalers after their ship in 1849.
- The islands themselves consist of two main islands and about 30 smaller rocks.

Sea of Japan

- It is a marginal sea of the **western Pacific Ocean.**
- It is located in Eastern Asia that is bounded by **Japan and Sakhalin Island to the east** and by Russia and Korea on the Asian mainland to the west.
- The sea itself lies in a deep basin, separated from the **East China Sea**to the south by the **Tsushima and Korea straits** and from the Sea of Okhotsk to the north by the La Perouse (or Soya) and Tatar straits.

4 SAU faculty members suspended: 500 scholars write to SAARC, foreign ministers of member countries

South Asian University (SAU)

- SAU is an **intergovernmental university funded by the governments of South Asian Association for Regional Cooperation (SAARC) countries.**
- The University is currently f**unctioning from Akbar Bhawan Campus in Chanakyapuri, New Delhi.**
- It falls under the **purview of the Ministry of External Affairs.**
- Its degrees are accredited in and **recognized by the University Grants Commission (UGC)** and its equivalents in all the eight SAARC countries.
- The university **offers graduate and doctoral level courses.**

SAARC

- SAARC is an **economic and political regional organisation of countries in South Asia set up in 1985.**
- It aims to accelerate the process of **economic and social development in its member states** through increased **intra-regional cooperation.**
- **The Secretariat** of the Association was set up i**n Kathmandu, Nepal**, on 17 January 1987.
- SAARC has **eight member countries (Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri-Lanka).**

Punjab Regiment soldiers set to march in Bastille Day Parade

Punjab Regiment

- The Punjab Regiment is **one of the oldest Infantry Regiments** of the Indian Army that **traces its origins to 1761.**
- **Prior to independence** and partition there were a **number of "Punjab regiments" in British India.** These were **amalgamated to form two regiments: the 1st Punjab Regiment, and the 2nd.**
- **At the onset of independence** in 1947, the **1st Punjab Regiment** being predominantly a Muslim regiment **went over to the newly raised Pakistan army, while the 2nd Punjab Regiment was retained in the Indian Army.**
- **Troops were transferred between regiments** based on whether the soldiers would be a part of India or Pakistan.
- The Punjab regiment has **participated in both World Wars and various post-independence operations.**
- **In World War-I, they were awarded 18 Battle and Theatre Honors**. **In**

World War-II, they earned 16 Battle Honors and 14 Theatre Honors.

- The Regiment **draws the bulk of its rank and file from Punjab** and **some neighbouring areas** of Himachal Pradesh and Jammu region.

Bastille Day Parade

- The Bastille Day military parade, also known as the **14 July military parade, is a French military parade** that has been **held on the morning of 14 July each year in Paris since 1880.**
- It is also **one of the oldest regular military parades** in the world.
- July 14 is the **anniversary of the storming of the infamous Bastille prison in 1789** a t**urning point for the success of the French Revolution**.
- This day is marked as the **National Day of France.**

SCIENCE & TECHNOLOGY

Climate change aiding spread of deadly virus in Europe: What is CCHF

- In India, one person succumbed to Crimean-Congo haemorrhagic fever last month in Gujarat. There is no vaccine against it yet.
- As Europe reels under a heatwave and wildfires, the rising temperatures have also raised fears of spread of viruses generally not found in colder climates. Alert has been sounded about the Crimean-Congo haemorrhagic fever (CCHF), an infection spread by ticks that has a high fatality rate, according to the World Health Organization (WHO).
- The CCHF is endemic to **Africa**, the **Balkan countries**, **Middle East**, and **parts of Asia**. The first fatality from the disease in Europe was in Spain, in 2016. According to Horizon, which publishes articles about European Union-funded research, "Scientists are now warning that CCHF, which can kill between 10% and 40% of patients, is spreading northward and westward in Europe."
- Cases have so far been reported in Spain, Russia and Turkey, and the UK.
- In India, **one person succumbed to CCHF last month in Gujarat**, the state that reports the majority of the country's cases of this disease.

Crimean-Congo Haemorrhagic Fever:

- It is a viral haemorrhagic fever **usually transmitted by ticks.**
- It can also be contracted through contact **with viraemic animal tissues** (animal tissue where the virus has entered the bloodstream) during and immediately post-slaughter of animals.
- The disease was first detected among soldiers **in the Crimean Peninsula (**near the Black Sea) in 1944.
- In 1969, it was found that an ailment identified in the Congo Basin was caused by the same pathogen. Thus, the disease was named the Crimean-Congo haemorrhagic fever.
- Its outbreak constitute a threat to public health services as the virus can lead to epidemics, has a high case **fatality ratio (10–40%).**
- **Transmission:**
    - Animals such as cattle, goats, sheep and hares serve as amplifying hosts for the virus.
    - **Transmission to humans occurs** through contact with infected ticks or animal blood.
    - It **can be transmitted from one infected human to another** by contact with infectious blood or body fluids", such as sweat and saliva.
    - The ticks can also be **hosted by migratory birds.**
- **Symptoms:**
    - Include fever, muscle ache, dizziness, neck pain, backache, headache, sore eyes and sensitivity to light.
    - After 2–4 days the agitation may be replaced by sleepiness, depression and lassitude
- **Treatment:**
    - There is **no vaccine for the virus** in either humans or animals, and treatment generally consists of managing symptoms.
    - According to the WHO, "the antiviral drug ribavirin has been used to

treat CCHF infection with apparent benefit."

What are the symptoms, cure of CCHF?

- CCHF symptoms include fever, muscle ache, dizziness, neck pain, backache, headache, sore eyes and sensitivity to light, according to the WHO.
- "There may be nausea, vomiting, diarrhoea, abdominal pain and sore throat early on, followed by sharp mood swings and confusion. After 2–4 days the agitation may be replaced by sleepiness, depression and lassitude," the WHO's website says.
- There is no vaccine for the virus in either humans or animals, and treatment generally consists of managing symptoms. According to the WHO, "the antiviral drug ribavirin has been used to treat CCHF infection with apparent benefit."

Climate change and spread of diseases

The ticks are moving up through Europe due to climate change, with longer and drier summers.

The CDC says climate change contributes to the spread of diseases in multiple ways, including warmer temperatures expanding the habitat of ticks and other insects and giving them more time to reproduce; the habitat offered by water undergoing changes; and animals moving to newer areas and people coming into contact with them.

El Nino and rising temperatures can lead to uptick of malaria in Ethiopia, warns research

- This year's El Nino climate event, combined with warming from climate change, could cause a rise in malaria cases in Ethiopia, new research suggests. The country has a history of climate-related malaria outbreaks and the study has corroborated that malaria upsurges in the country often follow **El Nino** events.
- El Nino events are strongly related to higher temperatures across the country, drought in north-west Ethiopia during the July–August–September rainy season and unusually heavy rain in the semi-arid south-east during October–November–December (OND).
- Malaria epidemics mostly occur in the country following Kiremt, the researchers found. Widespread epidemics are commonly associated with El Nino events when the maximum recorded temperature at a given station on a given day, also called **Tmax**, is high and drought is common.
- In Amhara — Ethiopia's second biggest region — malaria epidemics were not associated with ENSO, but with warm **Tropical Atlantic SST** and **higher rainfall**.
- Malaria-climate associations in Ethiopia were assessed by the researchers led by Adugna Woyessa using monthly climate data (1981–2016) from the Ethiopian National Meteorological Agency (NMA), SSTs from the eastern Pacific, Indian Ocean and Tropical Atlantic and historical malaria epidemic information obtained from the literature.

Malaria

- **Malaria** is a life-threatening mosquito borne blood disease caused by **plasmodium parasites.**
- It is predominantly found in the **tropical and subtropical areas of Africa,**

South America as well as Asia.

- It is preventable as well as curable.
- **Spread:**
  - The parasites spread through the **bites of infected female Anopheles mosquitoes.**
    - After entering the human body, parasites initially **multiply within the liver cells** and then **attack the Red Blood Cells (RBCs)** resulting in their rupture.
  - There are 5 parasite species that cause malaria in humans, and 2 of these species – Plasmodium falciparum and Plasmodium vivax – pose the greatest threat.
- **Symptoms:**
  - Symptoms of malaria include fever and flu-like illness, including shaking chills, headache, muscle aches, and tiredness.
- **Malaria Vaccine:**
  - Known by its lab initials as **RTS, S but branded as Mosquirix,** the vaccine has passed lengthy scientific trials that found it to be safe and **reducing the risk of malaria by nearly 40%, the best recorded.**
  - It was developed by GlaxoSmithKline (GSK) company and approved by the European Medicines Agency in 2015.
  - The RTS, S vaccine trains the immune system to attack the malaria parasite (Plasmodium (P.) falciparum, the deadliest species of the malaria parasite).

Initiatives to Curb Malaria

- **Global:**
  - The WHO has also identified 25 countries with the potential to eradicate malaria by 2025 under its **'E-2025 Initiative'.**
  - The WHO's **Global technical strategy for malaria 2016–2030** aims is to reduce malaria case incidence and mortality rates by at least 40% by 2020, at least 75% by 2025 and at least 90% by 2030 against a 2015 baseline.
- **India-Specific**:
  - In India, malaria elimination efforts were initiated in 2015 and were intensified after the launch of the National Framework for Malaria Elimination (NFME) in 2016 by the Ministry of Health and Family Welfare.
    - **NFME is in line with WHO's 2016-2030 Malaria Strategy**, which guides the WHO Global Malaria Programme (GMP).
  - The **National Strategic Plan for Malaria Elimination (2017-22)** was launched in July 2017 which laid down strategies for the following five years.
    - It gives year-wise elimination targets in various parts of the country depending upon the endemicity of malaria.
  - Implementation of the **High Burden to High Impact (HBHI) initiative** was started in four states (West Bengal, Jharkhand, Chhattisgarh and Madhya Pradesh) in July 2019.
    - **Distribution of Long Lasting Insecticidal Nets (LLINs)** to high burden areas has led to a reduction in endemicity in these 4

very high endemic states.
    - The **Indian Council of Medical Research (ICMR)** has established **Malaria Elimination Research Alliance-India (MERA-India)** which is a conglomeration of partners working on malaria control.

Study suggests new guidelines for diagnosing Alzheimer's

In these criteria, the condition is diagnosed in the clinic using blood biomarkers, similar to how diabetes and cardiovascular disease are diagnosed.

Alzheimer's Disease

- It is a **progressive and degenerative neurological disorder** that **affects the brain**, leading to **memory loss, cognitive decline, and behavioural changes**.
- It **slowly destroys memory and thinking skills** and, eventually, the ability to carry out the simplest tasks.
- It is the **most common cause of dementia**, accounting for **60-80% of all dementia cases.**
- The condition **primarily affects older adults**, typically starting after the age of 65, though early-onset forms **can occur in individuals younger than 65.**
- **Cause**: **The exact cause** of Alzheimer's disease **is not fully understood**, but it is believed to be **influenced by a combination of genetic, environmental, and lifestyle factors**.
- **Symptoms**:
    - **Early signs may include mild memory loss, difficulty finding words**, misplacing items, and **trouble with problem-solving**.
    - As the **disease advances, individuals** may experience more s**evere memory impairment, confusion, mood swings**, changes in behaviour, disorientation, and **difficulty with basic tasks like dressing and eating**.
- **Treatment**:
    - **There is currently no cure** for Alzheimer's disease, and the available **treatments mainly focus on managing symptoms** and slowing down its progression.
    - **Medications may be prescribed to enhance cognitive function** or manage behavioural and psychological symptoms.

Dementia

- Dementia is **not a specific disease** but rather an **umbrella term used to describe a group of symptoms affecting cognitive abilities, memory, thinking, and social abilities.**
- It is a **progressive conditio**n that **impairs a person's ability to carry out daily activities** and can significantly affect their quality of life.
- The most **common cause of dementia is Alzheimer's disease**, which accounts for the majority of cases.
- However, there are several **other types of dementia**, each with its underlying causes. Some of the common types of dementia **include: Vascular Dementia, Lewy Body Dementia, Frontotemporal Dementia and Mixed Dementia.**

India recorded all-time high of 93% DPT3 immunisation coverage in 2022: WHO

DPT3 Vaccine

- The DPT vaccine is a class of combination vaccines against three infectious diseases in humans: **diphtheria, pertussis (whooping cough), and tetanus.**
- The vaccine **components include diphtheria and tetanus toxoids** and either killed whole cells of the bacterium that causes pertussis or pertussis antigens.
- The primary dose of DPT provided as part of pentavalent vaccine and 2 booster doses **are given at 16 -24 months and 5-6 years, respectively.**
- **Diphtheria:**
    - It is an infectious disease caused by **Corynebacterium diphtheria**, a bacterium.
    - **Vulnerable groups:** Diphtheria particularly affects children **aged 1 to 5** years**.** In temperate climates diphtheria tends to occur during the colder months.
- **Tetanus**
    - It is an infection caused by **bacteria called Clostridium tetani.**
    - When these bacteria enter the body, they produce a toxin that causes painful muscle contractions.
    - Tetanus bacteria are more likely to infect **certain breaks in the skin**
    - It does not **spread from person to person.**
- **Pertussis**
    - It is also known as **whooping cough.**
    - It is a very contagious respiratory illness caused by a type of bacteria called **Bordetella pertussis.**
    - Whooping cough bacteria attach to the cilia (tiny, hair-like extensions) that line part of the upper respiratory system.
    - The bacteria release toxins (poisons), which damage the **cilia and cause airways to swell.**
    - It can **spread easily from person to person** through the air.

What does aspartame being 'possibly carcinogenic' mean?

The World Health Organization (WHO) recently declared aspartame, an artificial sweetener used in the food industry, as a possible carcinogen. Substances that potentially cause cancer are called carcinogens.

The expert committee

In order to create a common reference point for the recommendations that arise from the deliberations of the expert working committees, the IARC uses a grading system.

1. Grade 1 substances are factors known to cause cancer in humans, with sufficient evidence supporting their carcinogenicity. This category includes **smoking, asbestos, and processed meats**, all of which have been linked to a higher cancer hazard.
2. Grade 2 substances, or exposures, are classified as being probably or possibly carcinogenic to humans. Within Grade 2, there are two subcategories. '2A' includes agents that are probably carcinogenic in humans, supported by ample evidence of carcinogenicity in experimental animals but limited data regarding humans. **Red meats, DDT pesticide, and night-shift work** fall into the 2A category.

3. '2B' includes agents that are possibly carcinogenic in humans but for which there is insufficient evidence of carcinogenicity in animals and limited or inadequate evidence in humans. For example, **cell phone radiation and occupational exposure as a hairdresser** falls under 2B.
4. A Grade 3 recommendation is assigned to agents that can't be classified as carcinogenic due to limited or inadequate data, even in experiments. **Coffee, mercury, and paracetamol** are examples of agents in this category.

Risk v. hazard

- While the IARC grading system assesses the hazards with a substance for carcinogenicity, it does not measure the risk of cancer itself. A hazard is a source of harm – whereas a risk is the chance that you will be harmed by that hazard.
- IARC only categorises substances or exposures based on the strength of the available data about its properties and behaviour for carcinogenicity. It does not incorporate details regarding the level of harm each substance or exposure may pose to individuals.
- For example, both smoking and the consumption of processed meat are graded as carcinogens. But it is quite easy to comprehend that consuming small quantities of processed meat will not have the same level of harm as any amount of tobacco exposure.
- So it is not advisable to compare the IARC grades of two agents. A Grade 1 classification for both smoking and processed meat simply indicates that both agents can potentially cause cancer in certain situations. It does not provide any insight into the chance of a person developing cancer when exposed to such agents.
- In other words, exposure or substances within the same category of IARC grade does not carry the same risk – but it bears the same hazard.

Although the IARC's report on the hazard of aspartame for cancer suggested limited evidence from human and animal studies, and qualified the carcinogenicity to be grade 2B ('possible carcinogenic'), the JECFA report asserts that the risk threshold for the food additive remains within the acceptable limits for the average person consuming processed foods.

In sum, while aspartame has been classified as a '**possible carcinogen**', it is still safe to be used as a food additive in various products in reasonable quantities. But taking all the available evidence together, ultra-processed and processed foods – which are food products that have undergone some degree of processing from their natural states – are not good for health and well-being. The IARC and JECFA reports highlight that less is more when it comes to any food additives or taste enhancers, including sugar and artificial sweeteners.

Picolinic acid could help treat SARS-CoV-2 and influenza A

- It is a pyridinemonocarboxylic acid in which the carboxy group is located at position 2.
- It is an intermediate in the **metabolism of tryptophan.**
- It has a role as a MALDI matrix material and a human metabolite.
- It is a **conjugate acid of a picolinate.**
- The study describes the compound's remarkable ability to disrupt the entry of **enveloped viruses into the host's cell and prevent infection**.

- It is known to help in **the absorption of zinc and other trace elements** from our gut, but, in its natural form, it stays inside the body only for a short duration, and is usually excreted out quickly.
- It is effective against a variety of enveloped viruses, including flaviviruses like the Zika virus and the Japanese encephalitis virus.
- When the compound was tested in SARS-CoV-2 and influenza animal models, it was found to **protect the animals from infection.**
- It was also **found to reduce viral load** in the lungs when given to infected animals.
- In addition, the researchers found that picolinic acid led to an **increase in the number of immune cells in the animals.**

Electron rains on Mercury cause X-ray auroras, finds BepiColombo during close flyby

BepiColombo

- BepiColombo is a **joint European Space Agency (ESA) and Japan Aerospace Exploration Agency (JAXA) mission to Mercury.**
- The mission was **named after Giuseppe "Bepi" Colombo, an Italian mathematician** and engineer who made significant **contributions to the understanding of Mercury's orbit.**
- **Launched on October 20, 2018,** BepiColombo is an ambitious and complex mission designed to **study Mercury's surface, composition, magnetic field, and its interaction with the solar environment.**
- The BepiColombo **spacecraft consists of two main components:**
    - **Mercury Planetary Orbiter (MPO):** The MPO is primarily **provided by ESA** and is responsible for **mapping and studying Mercury's surface**, as well as its composition and topography.
    - **Mercury Magnetospheric Orbiter (MMO):** The **MMO is provided by JAXA** and focuses on **studying Mercury's magnetic field and magnetosphere**.
- **Objectives**:
- **Investigating Mercury's surface and composition** to better understand its geological history and formation processes.
- **Studying Mercury's magnetic field and magnetosphere** to gain insights into its internal structure and how it interacts with the solar wind.
- **Measuring Mercury's exosphere (a thin atmosphere**) and understanding its composition and dynamics.
- **Conducting experiments to test certain principles of general relativity** and improve our **understanding of gravity.**

What are Bacteriophages, the 'good viruses' that fight bacteria?

With antibiotic resistance rising, scientists think bacteriophages — which hunt and kill bacteria — could cure bacterial infections.

- Not all viruses are killers. As with bacteria, "**good**" or "friendly" viruses can also be beneficial for health.
- Scientists now talk of a **virome** — all the different types of viruses we host in our bodies which contribute to health, much like the bacterial microbiome.
- This virome is huge. You have 380 trillion virus particles living (or existing) in

or on your body right now — 10 times more than the number of bacteria. These viruses lurk in our lungs and blood, live on our skin and linger inside the microbes in our guts.
- They're not all bad, however: There are viruses that kill cancer cells and help break down tumors, others that train our immune system and help them fight pathogens, and even some that control gene expression in pregnancy.

Bacteriophages: Anti-bacterial guard dogs
- The vast majority of viruses inside us are bacteriophages — viruses that kill bacteria in our microbiomes. Bacteriophages, also known as phages, are harmless to human cells as they do not recognize them as their bacterial prey.
- They work by hunting down bacteria and attaching themselves to the surface of a bacterial cell, before injecting viral DNA material into the cell.
- The viral DNA then replicates inside the bacteria, sometimes by borrowing the DNA replication hardware of the bacteria.
- Once enough new viruses have been created inside the bacterial cell, the cell then bursts to release the new viral particles.

Phage therapy
- But antibiotic-resistant strains of bacteria are now on the rise, with experts saying antibiotic resistance is one of the greatest medical challenges facing global communities.
- As a result, scientists are racing to find new forms of antibiotic agents, putting phages back on the menu as agents to fight bacterial infections.
- The advantages of phages lie in their effectiveness against every multi-resistant pathogen.
- Phages are extremely precise in their elimination of bacterial strains — so much so that you don't disturb the **gut microbiome**, as is the case with antibiotics.

Phages were a Soviet medicine
- Due to the scarcity of antibiotics in Soviet-era Russia, phages were used to treat bacterial infections, and their use has continued in countries like Georgia, Ukraine and Russia for decades.
- Georgia is a hot spot for phage tourism, with patients from all over the world going there to be treated with phages.

Is there a place for phages in medicine?
- A central problem is that there is no standardization of therapy. Phage therapy must be precisely tailored to the bacteria that cause an infection in a patient.
- Infections can be caused by bacteria with various properties, so you need a cocktail of different phages as a therapy, and that mix of phages has to be available very quickly before the infection gets out of hand.
- And bacteria do also develop resistance to phage therapies.
- But phage therapies have good safety records. Pletz said humans ingest billions of phages every day with our food without any relevant side effects. That means our bodies should be able to tolerate phage therapies very well.
- The German research report recommends the next steps should include large-scale research and clinical projects to nail down effective phage therapies for different types of infections.

- For now, bacteriophages are unlikely to replace antibiotics. But scientists are optimistic they could be used in combination to make antibiotics more effective, especially against resistant strains of bacteria.

Bacteriophages

- It is also called **phage or bacterial virus**, any of a group of viruses that **infect bacteria.**
- It was discovered independently by **Frederick W. Twort** in Great Britain (1915) and **Félix d'Hérelle in France** (1917).
- D'Hérelle coined the term bacteriophage, **meaning "bacteria eater**," to describe the agent's bactericidal ability.

Characteristics of bacteriophages

- Thousands of varieties of phages exist, each of which may **infect only one type** or a few types of bacteria or archaea.
- Phages are classified in a number of virus families; some examples include Inoviridae, Microviridae, Rudiviridae, and Tectiviridae.
- Like all viruses, phages are simple organisms that **consist of a core of genetic** material (nucleic acid) surrounded by a protein capsid.
- The nucleic acid may be **either DNA or RNA** and may be double-stranded or single-stranded.
- There are three basic structural forms of phage: an icosahedral (20-sided) **head with a tail, an icosahedral head without a tail, and a filamentous form**.

Fruit flies develop specific defences against common bacteria; may explain human susceptibility to infections

- The immune systems of fruit flies develop certain genes that can combat common bacteria found in food, a new study has found.
- Bacteria such as **acetobacter** found in fruits can harm flies once they exit the gut and reach the bloodstream. However, various fly species have developed a specific peptide (strings of compounds that combine to form proteins) that can fight acetobacter
- The findings are critical as fruit flies' evolutionary process might help explain human susceptibility to certain diseases. That can help us fight infections, including infections that resist antibiotics.
- The bacteria in their food and environment mould the immune systems of fruit flies. These flies have developed two peptides to defend a single bacterial species that affects them.
- Some of these peptides are common in certain species. Various fly species have developed a particular peptide (**diptericin B**) to control acetobacter, the study added.
- This peptide is the silver bullet that kills this specific bacterium. Without it, flies are extremely vulnerable because acetobacter is so common in rotten fruit.
- Food and environment shape animal '**microbiome**' — the cluster of microbes that live in an organism. Our study shows how immune systems evolve in response to this, to control common bacteria that could otherwise cause harm
- While this study states how fruit flies defend food-borne bacteria, a 2021 study explained how these flies respond to food poisoning. The study explains

how olfactory responses restrict them from consuming the food that caused a prior infection — the same way we restrain from eating the food that caused food poisoning.

- Glial cells and neurons in the fly brain communicate, dampening olfaction and shielding the animals from consuming the pathogen again after an intestinal bacterial infection

Scientific breakthrough uses mRNA technology to create a highly effective malaria vaccine

- Messenger RNA (a mRNA) is **a type of single-stranded RNA involved in protein synthesis.**
- mRNA is **made from a DNA template during** the process of **transcription**.
- **The role** of mRNA is to c**arry protein information from the DNA in a cell's nucleus to the cell's cytoplasm** (watery interior), w**here the protein-making machinery reads the mRNA sequence and translates each three-base codon into its corresponding amino acid in a growing protein chain.**
- So, mRNA really is a form of nucleic acid which **helps the human genome, which is coded in DNA, to be read** by the cellular machinery.

mRNA Vaccines

- mRNA vaccines **work by introducing a piece of mRNA that corresponds to a viral protein**, usually a small piece of a protein found on the virus's outer membrane.
- **By using this mRNA**, **cells can produce the viral protein**.
- As part of a normal immune response, **the immune system recognizes that the protein is foreign and produces specialized proteins called antibodies.**
- Once produced, **antibodies remain in the body**, even after the body has rid itself of the pathogen, so that the immune system can quickly respond if exposed again.
- **Antibodies help protect the body against infection by recognizing individual viruses** or other pathogens, **attaching to them, and marking the pathogens for destruction**.
- If a person is exposed to a virus after receiving mRNA vaccination for it, antibodies can quickly recognize it, attach to it, and mark it for destruction before it can cause serious illness.
- **Individuals who get an mRNA vaccine are not exposed to the virus**, nor can they become infected with the virus by the vaccine.
- **How are mRNA vaccines made**
    - To make an mRNA vaccine, **scientists must first identify a protein on the outside of the virus** that the body's immune response will respond to (the "target" protein).
    - The **protein they choose must be sufficiently different from proteins on the outside of the body's own cells**, **so the immune system only attacks the virus**.
    - **They then identify the** DNA that has the information for making the target protein.
    - Scientists **use the DNA to produce the mRNA** for the target protein.
    - **Once enough mRNA has been made, the DNA is broken down to**

ensure that only the mRNA is packaged in the vaccine.
    - The speed and efficiency of this process can make large amounts of mRNA in a short period of time.

E. coli Outbreak in California's Burney

- **Escherichia coli**, commonly known as E. coli, is a **type of bacteria** that can be **found in the intestines of humans and animals.**
- coli is a **rod-shaped bacterium of the Enterobacteriaceae family**.
- While **most strains of E. coli are harmless and even beneficial**, **some strains can cause illness** and infections.
- Some kinds of E. coli **can cause diarrhoea**, while others **cause urinary tract infections**, respiratory illness and pneumonia, and other illnesses.
- **Transmission:** Pathogenic E. coli can be transmitted to humans **through contaminated food**, **water, or contact with faecal matter** from infected individuals or animals.
- **How does E. coli make you sick?**
    - **The most familiar strains** of E. coli that make you sick do so by **producing a toxin called Shiga.**
    - This toxin **damages the lining of your small intestine** and **causes diarrhoea.**
    - These strains of E. coli are also **called Shiga toxin-producing E. coli (STEC).**
    - The STEC that is **most well-known and most often referred to is E. coli O157:H7**, or just E. coli O157.
- **Symptoms:**
    - Symptoms of an E. coli infection can **vary depending on the specific strain and severity of the infection.**
    - Common symptoms include **diarrhoea (which may be bloody), abdominal pain and cramping, nausea,** and sometimes fever.
    - **In severe cases**, E. coli infections can **lead to haemolytic uremic syndrome (HUS),** a condition that can **cause kidney failure and other complications**, especially in young children and the elderly.
- **Treatment**:
    - Most E. coli infections are **self-limiting and resolve on their own** without treatment. However, it's **essential to stay hydrated** during the course of the illness.
    - **In severe cases or when complications arise, medical attention** may be required.

Organic nanogenerator that harvests light energy can power wearable devices on the go

- The device can generate **current and voltage** from minute amounts of heat or light that fall on it.
- The experimental exploration of energy materials has led to the successful synthesis of an organic energy material called **polyaniline-rubrene**, and they have fabricated an **Organic Pyroelectric Nanogenerator** (OPyNG).
- The **pyroelectric effect** of the device is induced by the light-induced change in spontaneous polarization occurring in the ultra-thin oxidized surface layer

of the polyaniline-rubrene thin film.

- **pyroelectric effect**
  - The pyroelectric effect is the **change in polarization** due to the **change in temperature.**
  - Ferroelectric materials are **expected to be strongly pyroelectric** because ferroelectric materials have a large range of temperature-dependent spontaneous polarization
- This effect holds a unique advantage in the **pyroelectric nanogenerator** (PyNG), as it can optically induce the pyroelectric effect, which is useful for energy harvesting.
- The fabricated OPyNG device utilizing organic material provides new insights and opens up new avenues for harvesting energy from organic materials.
- The OPyNG operates **in the UV-visible-NIR region** in self-powered mode, and it offers significant advantages as it can function as a self-sustainable standalone device.

Long Covid 'brain fog' equivalent to ageing 10 years, shocking study finds

Brain Fog

- Brain fog itself is **not a medical condition** but **instead a symptom of other medical conditions.**
- It is a term used to **describe a variety of symptoms that can affect your ability to think clearly.**
- Brain fog is **characterized by confusion, forgetfulness, and a lack of focus** and mental clarity.
- **Some examples of things a person might do** because of brain fog include:
  - **forgetting about a task** they had to complete;
  - **taking much longer than usual to complete** simple tasks;
  - feeling frequently **distracted**;
  - **feeling tired** when working;
- **Causes**: Brain fog is **typically rooted in a lifestyle that promotes hormonal imbalances**.
  - **Electromagnetic radiation** – from computer, mobile phone, tablets
  - **Stress** – reduce blood flow to the brain causing poor memory
  - **Lack of sleep**, no exercise
  - **Diet**: food allergies or sensitivities
  - **Toxins, pollution, chemical substances**, and insecticides
  - **Medications**
- **Treatment:** Treatment **depends on the cause.** For example, if you're anaemic, iron supplements may increase your production of red blood cells and reduce your brain fog.

Ancient genomic data shed light on the demise of the Copper Age

- Previous analyses of ancient genomic data have suggested that two major genetic turnover events occurred in Western Eurasia;
- One associated with the **spread of farming around 7,000-6,000 BC** and a second resulting from the **expansion of pastoralist groups** from the Eurasian steppe starting around 3,300 BC.
- The period between these two events, the Copper Age, was characterized by a

new economy based on metallurgy, wheel and wagon transportation, and horse domestication.

- However, what happened between the demise of Copper Age settlements (around 4,250 BC) and the **expansion of pastoralists is not well understood.**
- The recent study revealed that early contact and admixture between Copper Age farming groups **from south-eastern Europe and Neolithic groups from the steppe** zone in today's southern Ukraine, possibly starting in the 5,500 BC when settlement densities shifted further north.
- The early admixture during the Neolithic appears to be local to the NW Black Sea region of the fourth millennium BC and did not affect the hinterland in southeastern Europe.

Copper Age

- The Chalcolithic period, also known as the **Copper Age.**
- It describes a **transitional period** in human prehistory between the Neolithic period (New Stone Age) and the Bronze Age.
- It is characterized by the use of both stone tools and the beginning of metalworking, specifically the utilization of copper.
- One of the defining characteristics of this period is the simultaneous use of stone tools and early metal objects, primarily copper.
- In India, it spanned around **2000 BC to 700 BC.**
- This culture was mainly **seen in Pre-Harappan phase**, but at many places it extended to Post-Harappan phase too.
- The people were **mostly rural and lived near hills** and rivers.
- The Chalcolithic culture corresponds to the farming communities, namely Kayatha, Ahar or Banas, Malwa, and Jorwe.
- The people of this age started doing **animal husbandry and agriculture.**
- Apart from wheat, rice, they used to grow pulse crops like millet, lentil, urad and moong etc.

Integrate mpox with HIV, STI prevention & control programmes: WHO

- New HIV guidelines on viral suppression unveiled at international AIDS conference
- The World Health Organization (WHO) released new scientific and normative guidance for human immunodeficiency virus (HIV)
- The United Nations' health agency also recommended countries integrate **mpox detection**, prevention and care with existing and innovative HIV and sexually transmitted infection prevention and control programmes.
- More than 80 per cent of them reported sex as the most probable route of getting infected with mpox.

Monkeypox

- Monkeypox is **a viral zoonotic disease with symptoms** similar to smallpox, although with less clinical severity.
- The infection was **first discovered in 1958 following two outbreaks of a pox-like disease in colonies of monkeys** kept for research — which led to the name 'monkeypox'.
- **Symptoms:**
    - Infected people break out in a rash that looks a lot like chicken pox.

But the fever, malaise, and headache from Monkeypox are usually more severe than in chicken pox infection.
    - In the early stage of the disease, **Monkeypox can be distinguished from smallpox because the lymph gland gets enlarged.**
- **Transmission:**
    - Primary infection is through direct contact with the blood, bodily fluids, or cutaneous or mucosal lesions of an infected animal. Eating inadequately cooked meat of infected animals is also a risk factor.
    - Human-to-human transmission can result from close contact with infected respiratory tract secretions, skin lesions of an infected person or objects recently contaminated by patient fluids or lesion materials.
    - Transmission can also occur by inoculation or via the placenta (congenital monkeypox).
- **Vulnerability:**
    - It spreads rapidly and can cause one out of ten deaths if infected.
- **Treatment and Vaccine:**
    - There is no specific treatment or vaccine available for Monkeypox infection,
        - But the **European Union** has recommended a **Small Pox Vaccine, Imvanex to treat** monkeypox after the WHO declared monkeypox a global health emergency.

Abu Dhabi reports a case of 'potentially fatal' MERS-Coronavirus case

Middle East Respiratory Syndrome (MERS)

- MERS is a **viral respiratory disease caused by the Middle East respiratory syndrome coronavirus (MERS-CoV)** that was **first identified in Saudi Arabia in 2012.**
- **Coronaviruses are a large family of viruses that can cause** diseases ranging from the **common cold to Severe acute respiratory syndrome (SARS) and Coronavirus disease**2019.
- **MERS Symptoms:**
    - Typical MERS symptoms include **fever, cough and shortness of breath**.
    - **Pneumonia** is common but not always present.
    - **Gastrointestinal symptoms**, including diarrhoea, have also been reported.
- **Fatality Rate**: Approximately **35% of MERS cases reported to WHO have died.**
- **Prevention and Treatment:**
    - **No vaccine or specific treatment is currently available**.
    - **Treatment is supportive** and based on the patient's clinical condition.

What is MERS-CoV?

- It is a **zoonotic virus**, meaning it is **transmitted between animals and people**, and it is contractable through direct or indirect contact with infected animals.
- The **origins of the virus are not fully understood** but, according to the analysis of different virus genomes, it is **believed that it originated in bats and was transmitted to camels sometime in the distant past.**

- **Human-to-human transmission:** The virus **does not appear to pass easily from person to person unless there is close contact,** such as providing unprotected care to an infected patient.

World Fragile X Awareness Day 2023

Fragile X Syndrome

- It is an **inherited genetic disease** passed down from parents to children that causes intellectual and developmental disabilities.
- It is also known **as Martin-Bell syndrome.**
- It is the most common hereditary **cause of mental disability in boys**. It affects 1 in 4,000 boys.
- It's **less common in girls**, affecting about 1 in every 8,000. Boys usually have more severe symptoms than girls.
- People with FXS usually experience a range of **developmental and learning problems.**
- The disease is a **chronic or lifelong condition**. Only some people with FXS are able to live independently.
- The peculiar quality of this disease is that **if it is inherited by the father**, then **it will only affect the daughter**, but **if it is inherited** by **the mother**, then it can affect both genders.
- Causes
    - It is caused by a defect in the **FMR1 gene** located on the X chromosome.
    - The defect, or mutation, on the FMR1 gene prevents the gene from properly making a **protein called the fragile X mental retardation 1 protein**.
    - This protein plays a role in the functioning of the nervous system.
    - The exact function of the protein is not fully understood. A lack or shortage of this protein causes the symptoms characteristic of FXS.
- Treatment
    - It **cannot be cured**. Treatment is aimed at helping people with the condition learn key language and social skills.

Chemistry breakthrough makes fluorochemicals production safer

Fluorine

- Fluorine comes from a **calcium salt called calcium fluoride**, or fluorspar.
- Fluorspar is mined and then treated with sulphuric acid at a high temperature to release hydrogen fluoride (HF).
- Hydrogen fluoride is then made to react with other compounds to **create fluorochemicals.**
- Fluorine is a highly reactive element used to make fluorochemicals,
- It is used to produce plastics, **agrochemicals, lithium-ion batteries, and drugs.**
- **Issues with hydrogen fluoride**
    - A major downside of this process is that HF is an **extremely poisonous and corrosive liquid** that irritates the eyes and respiratory tract even at low concentrations.
    - It also **requires special transportation and storage**

- Hydrogen fluoride spills have occurred numerous times in the last decades, sometimes with fatal accidents and detrimental **environmental effects.**

- **New procedure to obtain fluorine atoms**
  - To avoid HF and to make the extraction process requires less energy, the researchers took inspiration from how the human body makes bones and teeth: through **calcium phosphate biomineralization.**
  - They ground fluorspar in a ball-mill with **potassium phosphate.**
  - While fluorine is very reactive, calcium atoms prefer phosphorus even more, so the milling created calcium phosphate and another compound with fluorine atoms. They called the latter Fluoromix.
  - When Fluoromix was reacted with organic compounds, **it could create around 50 fluorochemicals** with up to 98% yield.

No immediate cause for concern, epidemiologist tells DTE as MERS case detected in UAE

A 28-year-old male tested positive for MERS-CoV in Al Ain, WHO said

- Middle East respiratory syndrome (MERS) is a viral respiratory disease caused by a novel coronavirus (Middle East respiratory syndrome coronavirus, or MERS-CoV) that was first identified in Saudi Arabia in 2012.
- Coronaviruses are a large family of viruses that can cause diseases ranging from the common cold to Severe Acute Respiratory Syndrome (SARS).
- Typical MERS symptoms include fever, cough and shortness of breath. Pneumonia is common, but not always present. Gastrointestinal symptoms, including diarrhoea, have also been reported.
- Some laboratory-confirmed cases of MERS-CoV infection are reported as asymptomatic, meaning that they do not have any clinical symptoms, yet they are positive for MERS-CoV infection following a laboratory test.
- Most of these asymptomatic cases have been detected following aggressive contact tracing of a laboratory-confirmed case.
- Although most of human cases of MERS-CoV infections have been attributed to human-to-human infections in health care settings, current scientific evidence suggests that dromedary camels are a major reservoir host for MERS-CoV and an animal source of MERS infection in humans.
- However, the exact role of dromedaries in transmission of the virus and the exact route(s) of transmission are unknown.
- The virus does not seem to pass easily from person to person unless there is close contact, such as occurs when providing unprotected care to a patient.
- Health care associated outbreaks have occurred in several countries, with the largest outbreaks seen in Saudi Arabia, United Arab Emirates, and the Republic of Korea.

New algorithm to quantify terrestrial RFI in space for earth

STARFIRE Algorithm

- It is called as the Simulation of TerrestriAl Radio Frequency Interference in oRbits around Earth (STARFIRE) algorithm.
- **Advantages of this model**
  - It can **estimate the Radio Frequency Interference emitted by FM**

radio stations, Wi-Fi networks, mobile towers, radar, satellites, and communication devices, and use this calculation for designing and fine-tuning the antennas.
    - It is capable of **estimating and mapping the unwanted Radio Frequency Interference (RFI)** signals in space.
    - It can help design instruments that are capable of offering optimal operations in the presence of RFI and thereby, enriches the data obtained from the future space-based Astronomy missions.
    - This algorithm can also be **handy in orbit selection for future missions.**
- The scientists used information on the FM transmitter stations from six countries in the world. Data from Canada (number of stations - 8,443), USA (28,072), Japan (Tokyo - 21), Australia (2,664), Germany (2,500), and South Africa (1,731) were used as inputs for developing this model.

Radio Frequency Interference

- It is the conduction or radiation of radio frequency energy **that causes an electronic or electrical device to produce noise** that typically interferes with the function of an adjacent device.
- It also refers to the disruption of the normal functionality of a satellite due to the interference of radio astronomy.
- This interference can disrupt and disturb the normal functioning of electronic and electrical devices, and thus it is important to limit it when possible.

Conjunctivitis Cases Spike In Delhi-NCR, 100 Cases In AIIMS Daily

Conjunctivitis

- Conjunctivitis, **commonly known as Pink Eye, is an infection or inflammation of the transparent membrane that covers the eyelid and eyeball**. This membrane is **called the conjunctiva.**
- **Why do eyes appear Pink?**
    - When **small blood vessels in the conjunctiva become swollen** and irritated, **they're more visible**.
    - This is what **causes the whites of the eyes to appear reddish or pink.**
- **Causative Agent:**
    - It can be caused by **viruses, bacteria or by allergies.**
    - Both **bacterial and viral conjunctivitis are highly contagious**, while allergic conjunctivitis is not.
- **Transmission**:
    - It usually occurs through **direct or indirect contact.**
    - **Direct transmission happens through droplets** from the cough or sneeze of an infected person **or through hand-to-eye contact**.
    - **Indirectly,** it can **spread via shared personal items** like towels, makeup, pillows or contact lenses.
- **Signs and symptoms:**
    - Most common signs are **redness, swelling and itching in the eyes**.
    - The **eyes can also feel watery during the start of the flu**.
- **Treatment**:
    - For the treatment of conjunctivitis, one **needs to use a combination**

of medicines.
- One of the most useful treatments is **using artificial tears or even any lubricating eye drop**s; these can **help the infected person to maintain moisture**.
- **A warm or cold compress will also help** in giving relief from inflammation and swelling.

2D nanoflakes of material extracted from iron ore can protect sensitive optical equipment from light-induced damage

- Nanoflakes of a material called hematene extracted from iron ore have been found capable of **withstanding and acting as shield from high laser intensities**.
- Hence it could be used to make devices **called optical limiters** that can protect sensitive optical equipment from light-induced damage.
- **Radiation from laser sources** is highly concentrated and powerful and can be detrimental to sensitive equipment such as sensors, detectors, and other optical devices.
- When the input intensity increases optical limiters control the amount of light that passes through, thereby preventing damage to the optical component.
- These devices are often useful in **laser technologies, military, telecommunications**, aircrafts, and scientific research in several ways.
- They found that 2D nanoflakes of hematene is capable of withstanding very high laser intensities, and they exhibited excellent optical limiting of green laser light (532 nm) while maintaining a high linear transmission (about 87%) for low-intensity light.

Hematene

- It is **extracted from naturally occurring hematite**, the mineral form of iron(III) oxide, using a combination of sonication, centrifugation and vacuum-assisted filtration.
- It measures 3 atoms thick and has a more **efficient photocatalysis.**
- It is **ferromagnetic** (the mechanism by which certain materials like iron form permanent magnets, or are attracted to magnets) like a common magnet.
- It is capable of withstanding and acting as shield from high laser intensities

In Baltic Sea, citizen divers restore seagrass to fight climate change

Seagrass

- It is **flowering plant** that grows **submerged in shallow marine waters** like bays and lagoons.
- They are so-named because most species have long green, grass-like leaves.
- Seagrasses have roots, stems, and leaves and produce flowers and seeds.
- Like terrestrial plants, seagrass **also photosynthesizes and manufactures their own food** and releases oxygen.
- They evolved around 100 million years ago, and there are approximately 72 different seagrass species that belong to four major groups.
- **Distribution:**
  - They are found on **all continents except Antarctica.**
  - The tropical waters of the Indo-Pacific hold the highest diversity of seagrasses in the world.

- They occur all along the coastal areas of India **mainly in the Palk Strait and Gulf of Mannarin Tamil Nadu.**

Baltic Sea

- It is part of the **North Atlantic Ocean, situated in Northern Europe.**
- It extends northward from the latitude of southern Denmark almost to the Arctic Circle and separates the Scandinavian Peninsula from the rest of continental Europe.
- The Baltic Sea connects to the Atlantic Ocean through the **Danish Straits.**
- It is the largest expanse of brackish water in the world. **Its water salinity levels are lower than that of the World Oceans** due to the inflow of fresh water from the surrounding land and the sea's shallowness.
- **Bordering Countries:** Denmark, Germany, Poland, Lithuania, Latvia, Estonia, Russia, Finland and Sweden.
- **Major gulfs:** The **Gulf of Bothnia** to the north, the **Gulf of Finland** to the east, and the **Gulf of Riga slightly** to the south of that.

Alert issued against scrub typhus in Alappuzha

Scrub typhus

- It is a life-threatening infection caused by **Orientia tsutsugamushi bacteria** which is a major public health threat in South and Southeast Asia.
- It **spreads** to people through **bites of infected chiggers** (larval mites).
- **Symptoms:** The most common symptoms of scrub typhus include fever, headache, body aches, and sometimes rash.
- **Treatment:** Scrub typhus should be treated with the antibiotic doxycycline. Doxycycline can be used in persons of any age.
- There **is no vaccine available** for this disease.
- It will not spread from person to person.
- India is one of the hotspots with at least 25% of the disease burden.

Typhus fever

- Typhus fevers are a group of diseases caused by bacteria that include epidemic typhus, scrub typhus, and murine typhus.
  - **Epidemic typhus:** It is caused due to Rickettsia prowazeki and it is spread to people through contact **with infected body lice.**
  - **Scrub typhusis:** It caused due to Orientia tsutsugamushi and **spread by chiggers.**
  - **Murine typhus:** It is caused due to Rickettsia typhi **spread by fleas.** It occurs in tropical and subtropical climates around the world

Harness silvopasture systems for local climate resilience

Silvopasture system

- It is an ancient and proven practice that **harmoniously integrates trees, forage and livestock** on the same land.
- **Advantages**
  - This system **buffer against temperature and wind extremes**, providing a favourable living environment for livestock.
  - **Carbon sinks:** The trees on silvopasture lands act as natural carbon sinks, **sequestering significantly five-10 times** more carbon then pastures without trees, all while maintaining or enhancing

productivity.
    - **Nutrient cycling:** The extensive root systems of trees within silvopasture plots contribute to nutrient cycling, improved soil stability and quality, while effectively combating erosion.
    - Also, this system combine trees and livestock on the same land, silvopasture can play a vital role in **reversing the negative trend of deforestation** for pasture land.
    - It also regulates local climatic conditions, buffering against temperature and wind extremes, providing a **favourable living environment for livestock.**
    - **Soil infiltration** rates in silvopasture systems surpass those of open pastures, enhancing water storage potential.

Nutrient cycling

- The nutrient cycle is a system where **energy and matter are transferred** between **living organisms and non-living parts** of the environment.
- This occurs as animals and plants consume nutrients found in the soil, and these nutrients are then released back into the environment via death and decomposition.
- In forest environments, there is an exchange of nutrient elements such as hydrogen, nitrogen and oxygen among the soil, plants and animals living within the environment.

INDIAai and Meta India sign pact to collaborate on AI and emerging technologies

INDIAai

- It is the **National artificial intelligence Portal of India** which was launched on 28th May 2020.
- It is a **knowledge portal, research organisation**, and an ecosystem-building initiative.
- It stands to unite and promote collaborations with various entities in India's AI ecosystem.
- It is a joint initiative by the **Ministry of Electronics and IT (MeitY),National e-Governance Division (NeGD) and NASSCOM**.
    - **NeGD:** It was created in 2009 as an Independent Business Division under the Digital India Corporation (a not-for-profit company set up by MeitY).
    - **NASSCOM:** It is a not-for-profit industry association and the apex body for the IT and IT-enabled products and services sector in India.
- It is the single central knowledge hub on artificial intelligence and allied fields for aspiring entrepreneurs, students, professionals, academics, and everyone else.

Artificial intelligence (AI)

- It is a wide-ranging branch of computer science concerned with building smart machines capable of performing tasks that typically require human intelligence.

What is the Akira ransomware, and why has the government issued a warning against it?

The ransomware, found to target both Windows and Linux devices, steals and encrypts data, forcing victims to pay double ransom for decryption and recovery.

Akira ransomware

- The Akira ransomware is designed to encrypt data, create a ransomware note and delete Windows Shadow Volume copies on affected devices.
- The ransomware gets its name due to its ability to modify filenames of all encrypted files by appending them with the ".**akira**" extension.
- The ransomware is designed to close processes or shut down Windows services that may keep it from encrypting files on the affected system. It uses VPN services, especially when users have not enabled two-factor authentication, to trick users into downloading malicious files.
- Once the ransomware infects a device and steals/encrypts sensitive data, the group behind the attack extorts the victims into paying a ransom, threatening to release the data on their dark web blog if their demands are not met.

How Ransomware infect devices

- Ransomware is typically spread through spear phishing emails that contain malicious attachments in the form of archived content (zip/rar) files.
- Other methods used to infect devices include drive-by-download, a cyber-attack that unintentionally downloads malicious code onto a device, and specially crafted web links in emails, clicking on which downloads malicious code. The ransomware reportedly also spreads through insecure Remote Desktop connections.

46,000-year-old worms brought back to life from Siberian permafrost

- Scientists discovered and reanimated two kinds of frozen microscopic nematodes or roundworms in Siberia five years ago. A new study on them published Thursday reveals their secrets, including the fact that they are 46,000 years old
- Many animals like nematodes, and more famously, tardigrades, can survive extreme conditions by entering a dormant state called "cryptobiosis."
- They also tested the hardiness of the ancient worms by mildly drying them in the laboratory. When they did that, the worms produced a sugar called **trehalose**, which might be helping them survive harsh desiccation (drying) and freezing.

Permafrost

- Permafrost is **any ground that remains completely frozen—32°F (0°C) or colder—for at least two years straight.**
- **Global Distribution:**
    - These permanently frozen grounds are **most common in regions with high mountains** and in **Earth's higher latitudes**—near the North and South Poles.
    - Permafrost **covers large regions of the Earth**. Almost **a quarter of the land area in the Northern Hemisphere has permafrost** underneath.
- **Composition**:
    - Permafrost is **made of a combination of soil, rocks and sand t**hat are **held together by ice.** The soil and ice in permafrost **stay frozen all year long.**

- **Near the surface, permafrost soils also contain large quantities of organic carbon**—a **material leftover from dead plants that couldn't decompose**, or rot away, due to the cold.
- **Lower permafrost layers contain soils made mostly of minerals.**
- **A layer of soil on top of permafrost does not stay frozen all year**. **This layer, called the active layer, thaws during the warm summer months and freezes again** in the fall.

Fungal infections in the brain aren't just the stuff of movies — Africa grapples with a deadly epidemic

Fungi are present everywhere in our environment: in the air, in the soil, in decaying plant material, on our skin, and even in the gut as part of our natural flora. Microscopic, disease-causing fungi can invade various parts of the body, leading to a range of symptoms and health problems. In fact, fungal infections contribute to about 1.5 million deaths every year.

Fungal infections

- For the greater part of the history of humankind, fungal infections were never a threat to human health. This is mainly because most fungi cannot survive the warm human body temperature of 37°C. However, climate change and other environmental pressures have led to the emergence of species of fungi that are capable of surviving at human body temperatures.
- Even then, our immune systems are quite capable of fighting against fungal infections. For instance, our bodies can create localized acidic environments, limit micronutrient availability and release antimicrobial agents.
- However, when the immune system is weakened, fungi are able to evade the body's defences and avoid detection. They can generate bioactive agents which help them evade or adjust to the host immune response. Some adapt to survive in hostile, low-nutrient and low-oxygen environments.

Some examples

- One example of opportunistic fungal diseases is cryptococcal meningitis, which emerged with the HIV pandemic in the late 1980s. Today, sub-Saharan Africa contributes about 73% of all global cases and deaths resulting from the disease. Cryptococcal meningitis is caused by the fungus *Cryptococcus neoformans*, which is found in soil and bird droppings.
- The development of cheaper drugs has been hindered by a limited understanding of how the fungus causes such extreme damage in the brain.
- Another example of an HIV-related opportunistic fungal disease is pneumocystis jirovecii pneumonia. It's caused by a ubiquitous, airborne fungus *Pneumocystis jirovecii*, which is passed on from person to person. Pneumocystis hardly causes trouble in people with healthy immune systems, but they act as reservoirs and pass the infection to those with poor immune systems, who may develop serious symptoms including fever, a dry cough and trouble with breathing. Pneumocystis jirovecii pneumonia occurs in 15%-20% of HIV patients who present with respiratory problems.
- The diagnosis of pneumocystis jiroveci pneumonia is expensive and requires a well-equipped laboratory. In Africa's poor urban and rural healthcare facilities this will be a challenge. The fungus, *P. jirovecii*, is also extremely difficult to culture, which limits diagnosis and research.

Growing burden

The COVID pandemic seems to have made the global fungal burden worse. For instance, recent studies have shown that people who were infected with COVID and have recovered are vulnerable to infection with a fungus called mucormycosis, also known as the black fungus. COVID-induced lung damage, high blood sugar, and the steroids often used to treat it are all predisposing factors to black fungus infection. With a reduced capacity to clear fungal spores and a reduced immune response, thanks to the steroids, the fungus can gain entry and infect the sinuses and facial bones, eventually moving to the brain.

Antifungal drugs

- Most of the population affected by fungal infections live in rural or poor urban settlements.
- With poorly funded and overburdened healthcare systems, many African countries are not well prepared to deal with fungal infections. Additionally, some of the WHO-recommended antifungal drugs – such as flucytosine – are unavailable in most African countries. Ineffective and even rather toxic drugs are sometimes used instead.
- The emergence of drug-resistant fungal strains is also a growing threat. Of great concern is the rise in multi-drug resistant Candida species, azole-resistant Aspergillus species and clinically resistant Cryptococcus.

World Hepatitis Day - July 28

- It is observed each year on **July 28** to **raise awareness of viral hepatitis**, w**hich causes inflammation of the liver** that leads to severe disease and liver cancer.
- It is **recognized by the World Health Organization (WHO).**
- **The theme** for World Hepatitis Day 2023 is "**We're not waiting**". This theme highlights the need for urgent action to eliminate viral hepatitis by 2030.
- **Why July 28?**
    - July 28 is the **birthday of Dr. Baruch Blumberg (1925–2011).**
    - Blumberg **discovered the hepatitis B virus in 1967,** and 2 years later, **he developed the first hepatitis B vaccine.**
    - These achievements culminated in Dr. Blumberg **winning the Nobel Prize** in Physiology or Medicine in 1976.

Hepatitis

- Hepatitis is **inflammation of the liver.**
- Inflammation is swelling that happens when tissues of the body are injured or infected.
- **It can damage your liver.** This swelling and damage can **affect how well your liver functions.**
- Hepatitis **can be an acute (short-term)** infection **or a chronic (long-term) infection.**
- **What causes hepatitis?** There are **different types of hepatitis, with different causes:**
    - **Viral hepatitis is the most common type**. It is caused by one of several viruses -- h**epatitis viruses A, B, C, D, and E.**
    - **Alcoholic hepatitis** is caused by **heavy alcohol use.**
    - **Toxic hepatitis** can be **caused by certain poisons, chemicals,**

medicines, or supplements.
    - **Autoimmune hepatitis** is a **chronic type in which your body's immune system attacks your liver.** The cause is not known, but genetics and your environment may play a role.
- **How is viral hepatitis spread?**
    - **Hepatitis A and hepatitis E usually spread through contact with food or water that is contaminated with an infected person's** You can also get hepatitis E by eating undercooked food.
    - **Hepatitis B, hepatitis C, and hepatitis D spread through contact with the blood** of someone who has the disease.
    - **Hepatitis B and D may also spread through contact with other body fluids.** This can happen in many ways, such as sharing drug needles or having unprotected sex.
- **Symptoms**: Some people with hepatitis do not have symptoms and do not know they are infected. C**ommon symptoms include:**
- **Fever**
    - **Fatigue**
    - **Loss of appetite**
    - Nausea and/or vomiting
    - Abdominal pain
    - **Dark urine**
    - Clay-coloured bowel movements
    - Joint pain
    - **Jaundic**e, yellowing of your skin and eyes
- **Treatment**:
    - Treatment for hepatitis **depends on which type you have and whether it is acute or chronic.**
    - Acute v**iral hepatitis often goes away on its own.**
    - There are **different medicines** to treat the different chronic types of hepatitis.
    - Possible other treatments may **include surgery and other medical procedures.**

Carbon monoxide-resistant copper-cobalt nanocrystal@ nitrogen-doped carbon electrocatalysts for methanol oxidation reaction

- Researchers have **synthesized a trimetallic PtMnCo catalyst** that displayed superior catalytic activity and high CO tolerance when compared to commercially available catalyst.
- The choice of Manganese (Mn) as a dopant was based on its abundance and affordability and the multiple oxidation states it offers making it a good candidate for electro-catalysis.
- **Significance of DMFC**
    - Among the different classes of fuel cells proposed, DMFCs have long been considered an attractive alternate power source for **small vehicles such as forklifts and as battery chargers for mobile phones**, digital cameras, laptops, and other small electronic gadgets.
    - It has **high energy density**, **high efficiency**, and low operating temperature.

  - They are also much safer to operate because they deal with liquid fuel (methanol).
- The **methanol oxidation reaction (MOR) at the anode and oxygen reduction reaction (ORR) at the cathode are the main processes that determine the performance of DMFCs.
- Platinum is the most often used MOR catalyst. However, fundamental challenges such as slow kinetics, high manufacturing costs (due mostly to the pricey Pt-based catalyst), and CO poisoning of the Pt catalyst make commercialization of DMFCs challenging.
- Therefore, the search for an alternative Pt-based catalyst that circumvents the above issues is one of the most pressing research problems with respect to DMFCs.
- Alloying Pt with other transition metals such as (Ru, Co, Ni, and Fe) is thought to be a useful strategy for **improving the catalytic performance and durability** of Pt catalyst along with reducing the amount of Pt being used in the catalyst.

Horripilation

- Feeling hair on your arms stand up on a chilly evening or felt shivers run down your spine. The colloquial name for this phenomenon is **goosebumps**. In scientific parlance, this is **horripilation**.
- Characterised by small bumps that develop on a person's skin, underneath the hair follicles, horripilation is an involuntary reaction to cold weather.
- It has also been recorded in animals, such as when a cat raises its hackles.
- It is controlled by the sympathetic nervous system. Specifically, horripilation happens when the brain sends signals to tiny muscles called **arrector pili** in hair follicles causing them to contract. This is what makes the hair stand upright.
- The most common cause of horripilation is cold air near the skin. But researchers have also documented intense emotions, such as fear, shock, anxiety, love, sexual desire and inspiration, as also having the same effect.
- In most cases, horripilation is temporary. But if it persists, it could be a sign of a medical condition, like **keratosis pilaris**. Its symptoms include lumps that feel rough and dry and mimic goosebumps. These lumps are dead skin cells; they appear on the cheeks, bottom and front of the thighs, and the upper arms. They go away on their own or can be made to with the help of dermatological creams.

Migraine: how it starts and how to treat it

One in two people suffer from a headache disorder, while around 15% of people globally suffer from migraines.

Migraine is caused by a hypersensitive brain

- Migraine is a disease of hypersensitivity: The migraine brain has abnormally sensitive neuronal connections.
- Compared to people who don't get migraines, this leaves migraineurs more likely to respond to small changes in the environment, which can result in headaches or more serious migraine attacks. Migraine attacks are thought to originate from abnormal electrical excitability in sensory neurons in the

meninges, layers of membrane that protect the brain.
- When sensitized, these neurons send signals to the brain which trigger headache pain, photophobia, and other migraine symptoms. These neurons are also close to blood vessels, which is why headaches can feel like they pulse along with your heartbeat.
- Other systems such as the immune, digestive and cardiovascular system contribute to migraine.

What triggers migraine?
- There are a huge range of migraine triggers and each person's triggers can differ from the next. The most common triggers are:
- Bright lights and loud sounds. Strong smells like perfume, smoke, or certain smelly foods. Lack of sleep, poor quality sleep, or jet lag. Hunger or dehydration. Too much caffeine. Alcohol, especially red wine. Hormone fluctuations, such as before or during periods, pregnancy, or menopause. Foods and diet, especially diets containing ultra-processed foods and processed sugars. Stress.

Ways to help alleviate migraine symptoms

There are ways you can help to alleviate the severity of a migraine, or prevent a headache becoming a full-blown migraine.
- Drinking plenty of fluids or placing an icepack on your forehead can help, as can resting in a quiet, dark room to ease environmental stressors.
- Many patients learn to get migraine relief from cognitive behavioral therapy (CBT). It's unlikely to treat the disease, but it can teach you thought actions to cope with pain and understand migraine triggers.

How do you treat migraine?

Here are some of the most clinically successful migraine medications:
- **Calcitonin gene-related peptide (CGRP) monoclonal antibodies:** These new migraine medications block the action of a protein called **CGRP**. CGRP plays an important role in the development of migraine symptoms, sensitizing neurons in the meninges.
- **Triptans:** A class of medications which bind to certain types of **serotonin** receptors in the body and causes pain-relieving effects. Analgesics like paracetamol or aspirin can be effective in reducing headache pain, but don't tend to help reducing chronic migraine symptoms.
- The evidence for CGRP antibodies and Triptans as migraine treatments is particularly robust, with patients having dramatic improvements of life quality after taking the drugs.

Dengue cases in Delhi reach 5-year-high says report

Dengue
- It is caused by the **dengue virus** (DENV)
- It is transmitted to humans through the bites of infected female mosquitoes, primarily the **Aedes aegypti mosquito.**
- The severe form of dengue fever, also **called dengue hemorrhagic fever**, can cause serious bleeding, a sudden drop in blood pressure (shock) and death.
- It is more common in **tropical and subtropical climates.**
- **Symptoms:** The most common symptoms are high fever, headache, body aches, nausea and rash.

- Most will also get better in 1–2 weeks but in severe cases it can be fatal.
- **Treatment:**
    - There is **no specific treatment** for dengue.
    - Early detection of disease progression associated with severe dengue, and access to proper medical care lowers fatality rates of severe dengue to below 1%.
    - The dengue **vaccine CYD-TDV or Dengvaxia** was approved by the US Food & Drug Administration in 2019, the first dengue vaccine to get the regulatory nod in the US.

Cell-free DNA promises to transform how we find diseases

Cell-free DNA

- In the human body, most of the DNA in a genome is neatly packed inside cells with the help of specific proteins, protecting it from being degraded.
- In a variety of scenarios, **some fragments of DNA are 'released'** from their containers and are present outside the cell, in body fluids. These small fragments of nucleic acids are widely **known as cell-free DNA (cfDNA).**
- It can be generated and released from a cell in a number of possible situations, including **when a cell is dying and the nucleic acids become degraded.**
- Since an array of processes modulates the degradation, the amount, size, and source of the cfDNA can vary across a range as well.
- This could occur together with a variety of processes, including those required for normal development, those related to the development of certain cancers, and those associated with several other diseases.

Applications of cfDNA

- One of the most widely used applications of cfDNA has been **in screening foetuses for specific chromosomal abnormalities**, an application known as non-invasive prenatal testing.
- It is useful tool to **understand human diseases** and to use the knowledge to improve diagnosis, monitoring, and prognosis.
- It is useful in understanding **why a body is rejecting a transplanted organ.**
- This could be used as a **biomarker for neurological disorders** like Alzheimer's disease, neuronal tumours, stroke, traumatic brain injury,

Belle, the inobtrusive AI robot fish, is helping researchers to protect our marine ecosytems

- It is an **autonomous underwater robot** designed to c**ollect DNA samples and film underwater without disrupting the delicate ecosystem** it explores.
- **Objective**: By analysing DNA samples and video footage collected by the robot, researchers **aim to better understand the impact of human activities** on marine life and **develop targeted conservation strategies**.
- **Features**:
    - Belle is **silent, moves like a fish** and **doesn't create a disruptive wake** as she moves through her environment.
    - It **employs artificial intelligence (AI) to autonomously manoeuvre** and **capture isolated e-DNA samples**, as well as **high-resolution**

video footage.
- Measuring just **under a metre and weighing almost 10 kg** out of the water, Belle is **propelled by a silicone fin with two cavities** into which water is pumped in cycles.
- **These cavities are filled and emptied with water** through a pump system **that moves the fin back and forth**.
- Additionally, **its soft tail mimics the rising and falling motion of a fish**, creating no disturbance or turbulence in the water, **allowing it to blend effortlessly with other marine creatures.**

India's diabetes epidemic is making India's TB epidemic worse

Currently, India has around 74.2 million people living with diabetes while TB affects 2.6 million Indians every year. Yet few know how deeply these diseases are interlinked.

The evidence is clear: DM (diabetes mellitus, DM) increases the risk of developing respiratory infections. Also DM is a major risk factor that increases the incidence and severity of TB.

DM and TB co-infections adversely affect TB treatment outcomes in a patient. The worry is that among people with TB, the prevalence of DM was found to be 25.3% while 24.5% were pre-diabetic, in a 2012 study in tuberculosis units in Chennai.

How do DM and TB 'work' together

- DM not only increases the risk of TB, it also delays the sputum smear and culture conversion of an individual affected by both diseases. In other words, reducing the number of TB bacteria to below the threshold required to claim they have 'healed' will take longer than usual.
- DM impairs cell-mediated immunity; uncontrolled DM affects the **cytokine** response and alters the defences in the alveolar macrophages. The altered functions of small blood vessels in the lung (due to hyperglycaemia) along with poor nutritional status may facilitate the invasion and establishment of TB.
- As people with diabetes have already compromised immune function, the risk of TB infection is high. They will also have a higher bacterial load. The coexistence of TB and DM in patients may also modify TB symptoms, radiological findings, treatment, final outcomes, and prognosis. Individuals with TB and DM are more likely to have cavitary lesions in lower lung fields.

How does DM affect people with TB?

- In individuals affected by both diseases, the lungs are severely affected (in studies, researchers have observed multiple and large lung cavities). **Persistent inflammation** has also been seen in people with DM and TB – even after they have completed their TB treatment.
- Experts have reported that TB-related respiratory complications have been a common cause of death among people with TB and DM, but which wasn't the case with people with TB only.
- DM directly affects the outcomes of those affected by both diseases. However, a recent study reported that a higher fraction of unfavourable TB treatment outcomes occurred among people with low body-mass indices and with low glycated haemoglobin levels (better known as HbA1c) compared to people with low BMI and high HbA1c. This indicates that one's nutritional status is

important for favourable TB treatment outcomes. In effect, the study extended the evidence of association of undernutrition with TB.

Detecting carbon molecules in space

The required steps for life arise from non-living matter are, the formation of complex organic molecules, like **amino acids**, from simpler ones, like **CH3+**, or **methylium**.

Life is carbon-based

- The CH3+ molecule, which is also known as methyl cation, has been **detected in space for the first time by the James Webb Space Telescope (JWST)**. Organic molecules are carbon based. They contain carbon atoms bonded to hydrogen atoms but can also bond to other elements, such as oxygen, nitrogen or phosphorus.
- Everything that makes us and all life on Earth is carbon based.
- CH3+ is a very simple organic molecule, just one carbon atom and 3 hydrogen atoms. But it reacts with other molecules to form more complex ones.

Looking for molecular fingerprints in space

- Scientists found the fingerprints of the CH3+ molecule in light coming from a swirling disk of dust and gas around a young star. The disk is in the **Orion Nebula**, 1,350 light years from Earth.
- The Orion Nebula is visible to the naked eye although you may only see a dot on Orion's sword slightly below the belt.
- Visible light is just a fraction of the whole picture. But every atom and molecule absorbs or emits light uniquely, with its own specific color palette.
- For example, hydrogen, the simplest of atoms, when excited, emits a red glow, and if you view it through a prism, you will see four characteristic lines that make up its spectrum.

The lab had been studying the fingerprint of molecules and analyzed CH3+ in detail. And that enabled scientists to match the unknown fingerprint detected by the JWST to this specific, life-giving molecule.

Lancet study finds link between antibiotic resistance genes, water and sanitation

Water and sanitation interventions are needed to block transmission of antibiotic resistance genes, antibiotic-resistant bacteria and dissemination of antibiotic residues between humans, animals, environment and the food-supply chain

- The highest burden of antibiotic resistance occurring in low-resource settings was a factor behind ARGs causing deaths. It also said the association of water and sanitation with ARG was stronger in urban-over-rural areas.
- Pathogenic bacteria can acquire ARGs from other bacteria through horizontal gene transfer. (Horizontal gene transfer is the movement of genetic material between unicellular and / or multicellular organisms).
- The researchers also found that low-income and middle-income countries (LMICs) had the highest burden of antibiotic-resistant infections. Some of the most concerning ARGs are believed to have emerged in **LMICs.**
- However, additional studies were needed to determine if there is a causal relationship between improving water, sanitation and hygiene (**WASH**) and antibiotic resistance burden. Further metagenomic data from LMICs is also needed

- The abundance of ARGs was highest in **(sub-Saharan) Africa**, followed by **South-East Asia** and **South and Central America**. Total ARGs were also highest in Africa, the study found.

One Health: FAO, UNEP, WHO and WOAH launch research agenda for antimicrobial resistance

- The 'Quadripartite' — comprising the United Nations (UN) Food and Agriculture Organization (FAO), the UN Environment Programme (UNEP), the World Health Organization (WHO) and the World Organisation for Animal Health (WOAH) — released the One Health Priority Research Agenda on Antimicrobial Resistance.
- On similar lines, **WHO** also launched a global research agenda for AMR in human health on June 2023. The agenda prioritises 40 research topics for evidence generation to inform policy and interventions by 2030. It also aims to guide a variety of stakeholders in generating new evidence to address antimicrobial resistance, with a focus on low- and middle-income countries.
- It defined '**One Health**' as an integrated, unifying approach that aims to sustainably balance and optimise the health of people, animals and ecosystems.
- The concept acknowledges the health of humans, domestic and wild animals, plants, and the larger environment, including ecosystems, are inextricably linked and interdependent. At this One Health interface, addressing global health issues necessitates a multisectoral, multidisciplinary response to AMR.

Using a mixed-methods approach, global experts identified five key pillars as well as three cross-cutting themes, namely gender, vulnerable populations, and sustainability, as follows:

Transmission

- This pillar focuses on the environment, plant, animal, and human sectors where AMR transmission, circulation and spread occur. This includes what drives this transmission across these areas, where these interactions occur, and the impact on different sectors.

Integrated surveillance

- This pillar aims to identify cross-cutting priority research questions in order to improve common technical understanding and information exchange among One Health stakeholders. The surveillance aims for harmonisation, effectiveness, and implementation of integrated surveillance with a focus on LMICs.

Interventions

- This pillar focuses on programmes, practises, tools, and activities aimed at preventing, containing, or reducing the incidence, prevalence, and spread of AMR. This also calls for the best use of existing vaccines, as well as other One Health-related measures to reduce AMR.

Behavioural insights and change

- The priority research areas under this pillar are concerned with comprehending behaviour across various groups and actors involved in the development and spread of AMR at the One Health interface. It focuses on research addressing human behaviour that affects AMR, including ways to combat it.

Economics and policy

- From a One Health standpoint, this pillar addressed investment and action in AMR prevention and control. This pillar also takes into account the cost-effectiveness of an AMR investment case, financial sustainability, and long-term financial impact.
- This research agenda aims to direct future research in One Health AMR with a focus on low-resource settings. The agenda also emphasises the importance of developing research capacity in LMICs, which will be critical for addressing research gaps and developing evidence.
- The agenda at the regional and national levels requires tailoring and the development of specific research questions.

Soil microbiomes should be included in One Health goals: Study

- One Health approach recommends global strategies to identify and manage the spread of infectious diseases and antimicrobial resistance (AMR).
- Soil microbiomes play a crucial role in maintaining healthy water and environmental stability. They underpin global food security that eventually affects the overall sustainability of terrestrial life in multiple ways
- These microbiomes provide a habitat for microorganisms that benefit the environment by delivering important ecosystem and host functions. But they also work as a reservoir of human pathogens that induce **antibiotic resistance genes (ARGs)** and are sources of organic and inorganic pollutants.
- Soil microbiomes impact human and animal immune systems by interacting with them through **food chains**. They also directly influence the quality of the environment through air and water.
- Soil, for instance, is a direct source of plant microbiomes, including beneficial and pathogenic microorganisms. Grazing herbivores are exposed to soil microbiomes via direct ingestion or the consumption of plant microbiomes, which provides a microbial source for the gut microbiome that can impact overall health and immune-system priming.
- Organic waste like plant litter and debris such as gravel, sand and others deliver microorganisms back to the soil, thereby closing the microbial loop, the researchers noted. However, any disruption in this can lead to diseases in the host.
- Soil microbiomes also hold reservoirs for crucial microbial hazards of human, plant and animal pathogens. Soil-borne pathogens such as ***Yersinia pestis, Clostridium botulinum and Bacillus anthracis*** are present in soil across the globe. They cause hundreds of millions of infections each year via direct or indirect interactions with human, animal and plant food cycles.
- Previous evidence showed that soil microbiomes have assisted in transferring ***Salmonella enterica*** serotype type, responsible for **typhoid**, from soil to plants and eventually to consumable fruits and seeds. Moreover, it found that soil microbiomes are responsible for the development and spread of AMR — one of the biggest threats to global public health.

Microplastics in 90% frogs studied in Bangladesh delta, can threaten biodiversity: Study

- 90 per cent of the frogs sampled from the Bengal delta in Bangladesh had

microplastics, report noted.
- Frogs play a vital role in the food web and help in keeping aquatic ecosystems healthy. They also control insects that cause various diseases in humans like mosquitoes of malaria and dengue.
- Toxic chemicals in microplastics cause severe damage and even mortality, according to the authors of the report.
- Personal care products, **cosmetics, textile fibres** and **air blasting media** are the primary sources of microplastics in aquatic environments. The secondary sources are tiny plastics that originate over time from larger plastics by chemical and photochemical reactions.
- Another study reported microplastics in the European Common Frog (*Rana temporaria*) collected from a high-mountain ecosystem (the Cottian Alps in northwest Italy).
- Microplastics were also found in tadpoles of pond-breeding amphibians from Poland and Central Europe and in Yangtze River Delta, China.
- Compared to these studies, microplastics abundance in the frogs of Bengal delta was very high.

Microplastics

Plastic pollution that ends up in the ocean deteriorates and breaks down and ends up as **Microplastics. Microplastics are plastic particles less than 5mm in diameter.**

- **Classification:**
  - **Primary Microplastics:** They are tiny particles **designed for commercial use and microfibers** shed from clothing and other textiles.
    - E.g. **microbeads** found in personal care products, **plastic pellets** and plastic fibres.
  - **Secondary Microplastics:** They are **formed from the breakdown of larger plastics** such as water bottles.

Menace of Microplastics

- **Marine Debris:** According to the **IUCN**, at least 8 million tonnes of plastic end up in the oceans every year and **make up about 80% of all marine debris** from surface waters to deep-sea sediments.
  - As per **UNEP**, in the last four decades, concentrations of these particles appear to have increased significantly in the surface waters of the ocean.
- **Impact on Marine Life:** The most visible and disturbing impacts include **suffocation and entanglement of hundreds of marine species.**
  - Marine organisms such as fish, crabs and prawns consume these microplastics **misidentifying them as food.**
- **Impact on Humans:** Humans consume these marine animals as seafood which leads to several health complications.
  - A study conducted by the **World Wide Fund for Nature** revealed that an **average person consumed 5 grams of plastic.**
- **WHO's Stand on Microplastics:** The **World Health Organization (WHO)** claims that the level of microplastics in drinking-water is not yet dangerous for humans but called for more research into potential future risk.
  - **Microplastics larger than 150 micrometres are not likely to be**

absorbed by the human body but the chance of absorbing very small microplastic particles, including nano-sized plastics, are higher.

Initiatives Taken

- **Global Initiatives:**
  - **Global Partnership on Marine Litter (GPML):** The GMPL was launched at the **Earth Summit** in 2012 in response to a request set out in the **Manila Declaration.**
    - Under the Manila Declaration, 65 signatories reaffirmed their **commitment to develop policies to reduce and control wastewater, marine litter** and **pollution from fertilizers.**
  - **G7 Summit:** At the 2015 **G7 summit** in Bavaria, Germany, the risks of microplastics were acknowledged in the Leaders' Declaration.
  - **GloLitter Partnerships Project:** Launched by the **IMO** and **FAO**, it aims to **prevent and reduce marine plastic litter from shipping and fisheries.**
    - 30 countries including India have joined this global initiative to tackle marine litter.
  - **London Convention, 1972:** The **1972 Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matter** was signed to control all sources of marine pollution and prevent pollution of the sea through regulation of dumping into the sea of waste materials.
    - The **1996 Protocol to the London Convention** (the London Protocol) and the **1978** Protocol to the **International Convention for the Prevention of Pollution from Ships (MARPOL)** are other similar initiatives.
  - **World Environment Day, 2018:** It was hosted in India, the world leaders vowed to "Beat Plastic Pollution" & eliminate its use completely.
  - **Plastic Pacts:** The **Plastics Pacts** are business-led initiatives to transform the plastics packaging value chain for all formats and products.
    - They bring together everyone from across the plastics value chain to implement practical solutions.
    - **The first Plastics Pact was launched in the U.K. in 2018.**
- **India-Specific Initiatives:**
  - **Elimination of Single Use Plastic:** In 2019, the Prime Minister of India pledged to **eliminate all single-use plastic in the country by 2022**, with an immediate ban in urban Delhi.
  - **Important Rules: Plastic Waste Management Rules, 2016** state that every local body has to be responsible for setting up infrastructure for segregation, collection, processing, and disposal of plastic waste.
    - Plastic Waste Management (Amendment) Rules 2018 introduced the concept of **Extended Producer Responsibility (EPR).**
  - **Un-Plastic Collective: Un-Plastic Collective (UPC)** is a voluntary initiative launched by the **UNEP-India, Confederation of Indian Industry and WWF-India.**
    - The Collective seeks to minimise externalities of plastics on the ecological and social health of our planet.

Extended Producer Responsibility (EPR)

- EPR is a **policy approach under which producers** are given a significant responsibility – financial and/or physical – for the **treatment or disposal of post-consumer products.**
- Assigning such responsibility could in principle provide incentives to prevent wastes at the source, promote product design for the environment and support the achievement of public recycling and materials management goals.

India: Happy To Share India's AI-Based Language Platform With SCO

Bhashini Platform

- Digital India BHASHINI, is **India's Artificial Intelligence (AI)-led language translation platform.**
- It **seeks to enable easy access to the internet and digital services in Indian languages**, including voice-based access, and **help the creation of content in Indian languages**.
- It **aims to make Artificial Intelligence and Natural Language Processing (NLP) resources available in the public domain** to be used by -- Indian MSMEs, startups and individual innovators.
- This will **help developers to offer all Indians easy access to the internet and digital services in their native languages**.
- This online platform **also has a separate 'Bhasadaan' section which allows individuals to contribute to multiple crowdsourcing initiatives,** and it is also accessible via respective Android and iOS apps.
- It is **aimed to build and develop an ecosystem where various stakeholders** like institutions, industry players, research groups, academia and individuals **can unite to maintain an 'ever-evolving repository of data, training and benchmark datasets**, open models, tools and technologies.
- The **contribution can be done in four ways -- Suno India, Likho India, Bolo India and Dekho India** -- where users have to type what they hear or have to validate texts transcribed by others.

India initiates safeguard probe on met coke imports

Metallurgical coke

- It is a carbonaceous material produced by **heating bituminous coal in the absence of air.**
- It is produced by heating coal in coke ovens at high temperatures (around 1,000 to 1,200 degrees Celsius).
- It is used as a fuel and reducing agent in the **production of iron and steel.**
- **Properties**
    - It has an **open, porous structure** and may appear glassy in some varieties.
    - It has also a low volatile content or rather low waste product content due to the heat treatment process received.
    - It has a high **carbon content, low ash content, and high strength.**
    - Its porous structure allows for good gas flow and provides structural support in the blast furnace.
- However, the "ash" constituents, that were part of the original bituminous coal feedstock, remain intact in the finished product.

- Met Coke is available in a wide range of sizes; from fine powder (30 mm) to basketball-sized lumps (20 cm).

CMV and ToMV: The two 'mosaic' viruses that hit tomato crop in Maharashtra and Karnataka

The current sharp increase in the price of tomato is due to lower production of the vegetable. How do these viruses infect the crop, and what can be done to prevent it? Tomato growers in Maharashtra and Karnataka have blamed two different viruses for the loss of yields earlier this year. Farmers in Maharashtra have said their tomato crop was impacted by attacks of the **cucumber mosaic virus** (CMV), while growers in Karnataka and other South Indian states have blamed the **tomato mosaic virus** (ToMV) for crop losses.

What are CMV and ToMV?

- The two plant pathogens have similar names and cause similar damage to crops, but they belong to different viral families, and spread differently.
- ToMV belongs to the **Virgaviridae** family and is closely related to the tobacco mosaic virus (TMV). ToMV hosts include **tomato, tobacco, peppers, and certain ornamental plants.**
- CMV has a much larger host pool that includes **cucumber, melon, eggplant, tomato, carrot, lettuce, celery, cucurbits** (members of the **gourd family, including squash, pumpkin, zucchini, some gourds, etc.**), and some ornamentals. CMV was identified in cucumber in 1934, which gave the virus its name.

How do these two viruses spread?

- ToMV spreads mainly through **infected seeds, saplings, agricultural tools** and often, through the hands of nursery workers who have failed to sanitise themselves properly before entering the fields. It would require only a few infected saplings for the virus to take over an entire field in a matter of days.
- CMV is spread by **aphids**, which are sap-sucking insects. CMV too can spread through human touch, but the chances of that are extremely low.
- Conditions of **high temperature followed by intermittent rain**, which allow aphids to multiply, are conducive to the spread of CMV,
- Researchers said these conditions were seen in Maharashtra — the late rabi crop (planted in January-February) faced a sudden bout of rain followed by extreme heat.

How do the viruses affect the crop?

- Both viruses can cause almost 100 per cent crop loss unless properly treated on time. The foliage of plants infected with ToMV shows alternating **yellowish and dark green areas**, which often appear as blisters on the leaves. Distortion of leaves and twisting of younger leaves are also symptoms. The fruit develops necrotic spots, which leads to overripening. Younger plants are dwarfed, and fruit setting is affected.
- CMV too causes **distortion of leaves**, but the pattern is different. Often leaves at the top and bottom are distorted while those in the middle remain relatively blemish-free. In cucumber, the virus causes a mosaic-like pattern of alternating yellow and green spots. In tomato, fruit formation is affected, and in some cases the fruit is distorted and small.
- While specific effects vary depending on the host, overall, CMV causes

stunting and lower production.

Controlling CMV is more difficult, given the large number of hosts the virus can live on. The best way is to stop the **aphids**, which can be done by spraying quick acting **insecticides** or **mineral oils** on the plants. Irritating the aphids can spread the virus to other fields.

60 sheep and goats die, 200 fall sick due to contagious animal disease in Himachal's tribal belt.

Peste Des Petits Ruminants (PPR)

- PPR is a **highly contagious viral disease of sheep and goats** with **high mortality.**
- It is **caused by a virus of the family paramyxoviridae and genus morbillivirus.** It is closely related to other members of the genus, including the rinderpest virus, measles virus, and canine distemper virus.
- **Symptoms**:
    - PPRV causes disease with an **array of clinical signs**. It also **causes immunosuppression**, which makes affected animals more likely to pick up other infections.
    - **Clinical signs of PPR**: **Fever, Eye and nasal discharges**, **Sores in the mouth**, **Diarrhoea, Listlessness**, Respiratory signs (coughing and pneumonia), Abortion and death, with case **fatality rates as high as 90%** (though more commonly around 20%).
- **Transmission:**
    - PPR is mainly spread during **close contact when a susceptible animal inhales** the **virus from infected animals' coughing and sneezing**.
    - Transmission can also occur **indirectly through contact with infected objects** (fomites) **such as feed troughs, bedding** etc.
    - **Sources of PPRV include secretions from the eyes, nose, and mouth** of infected animals, **as well as their faeces**.
- Once introduced, the **virus can infect up to 90 percent of an animal herd**, and the disease **kills anywhere from 30 to 70 percent of infected animals**.
- The PPR virus **does not infect humans.**
- **Disease prevalence:**
    - PPR was **first described in 1942 in Côte d'Ivoire**. Since then, the disease has spread to large regions in **Africa, the Middle East and Asia**.
    - **In India,** the disease outbreaks have been reported in **Himachal Pradesh, Andhra Pradesh, West Bengal, Telangana, Karnataka** and **Chhattisgarh**.
- **Currently, a global initiative driven by the** Food and Agriculture Organization of the United Nations (**FAO**) and the **World Organisation for Animal Health** (OIE) **exists to eradicate PPR by 2030.**

Climate change unveils new methane source: Groundwater springs of Norway

- Climate change has exposed a new source of methane in the Arctic: groundwater springs. As global warming drives glaciers to retreat, methane-rich groundwater springs are punching through the surface in the Arctic, the

study published
- Methane, a greenhouse gas, is 84 times more potent than carbon dioxide on a 20-year timescale.
- In Svalbard, a Norwegian archipelago in the Arctic, groundwater springs could be emitting more than 2,000 tonnes of methane annually.
- These springs are not part of the **global methane budget**. The global methane budget estimates the amount of methane released through sources and captured through sinks.
- The water in all but one site had high levels of dissolved methane, which escapes into the atmosphere. Further, these springs emit this greenhouse gas year-round, the researchers noted.
- The rocks are most likely regulating the springs' emissions. For example, areas where groundwater emerged from **shale rocks** were found to be methane hotspots.
- High methane concentrations near shale rocks suggested a geologic or thermogenic (heat) source of gas, which moves upwards through fractures in the rocks and gathers under the glacier. A lot more methane gas could be trapped under glaciers, waiting to escape, the researchers explained.

NTPC commissions 660 MW unit of Barh plant in Bihar

Barh Super Thermal Power Project (STPP)
- STPP is a **3GW supercritical coal-fired power station** being **developed by India's state-owned National Thermal Power Corporation** (NTPC) **in Barh, Bihar.**
- The power plant will house a t**otal of five coal-fired power generating units of 660MW capacity each.**
- The mega power project is being **developed in two stages**, **with stage one comprising three units** for a total installed c**apacity of 1,980MW** and **stage two involving two units for a total capacity of 1,320MW.**
- The **plant utilizes supercritical pressure technology** to obtain improved thermal efficiency while **reducing greenhouse gas emissions.**
- **Source of water:** Barh town is **located closer to the River Ganga** which is the source of water for the coal-fired thermal power facility.
- **Source of Coal:**
    - The **coal required for stage one** operation of the project will be procured **from the Central Coal Fields**, a subsidiary of India's state-owned Coal India Limited (CIL).
    - **Coal for the stage two** operations **comes from the NTPC Chatti-Bariatu coal mine** located in

Supercritical pressure technology
- Supercritical (SC) and ultra-supercritical (USC) **power plants operate at temperatures and pressures above the critical point of water**,**e., above the temperature and pressure at which the liquid and gas phases of water coexist in equilibrium**, at which point there is no difference between water gas and liquid water.
- This r**esults in higher efficiencies – above 45%.**
- SC and ultra -supercritical USC **power plants require less coal per megawatt-hour**, **leading to lower emissions** (including carbon dioxide and

mercury), **higher efficiency and lower fuel costs per megawatt.**

Kerala teenager dies of lethal 'brain eating amoeba'

Naegleria fowleri

- It is **an amoeba (single-celled** living organism) that **lives in soil and warm freshwater, such as lakes**, rivers, and hot springs.
- It is commonly called the **"brain-eating amoeba".**
- Naegleria fowleri **is a heat-loving (thermophilic) organism**, meaning it thrives in heat and likes warm water. It grows **best at high temperatures up to 115°F (46°C)** and can survive for short periods at even higher temperatures.

How does it infect ?

- It infects people when **water containing the amoeba enters the body through the nose.**
- This typically happens **when people go swimming, diving** or when they put their heads under fresh water, like in lakes and rivers.
- The **amoeba then travels up the nose to the brain**, where it **destroys the brain tissue and causes** a devastating infection called **primary amebic meningoencephalitis (PAM).**
- **PAM is a** very **serious infection of the central nervous system** that's almost always fatal. The **fatality rate is higher than 97% even with treatment.**
- **Cause of death:** The infection **destroys brain tissue, causing brain swelling** and death.
- Naegleria fowleri **infections may also happen when people use contaminated tap water to cleanse their noses** during religious practices or rinse their sinuses (sending water up the nose).
- There is **no evidence that Naegleria fowleri can spread through water vapor or aerosol droplets** (such as shower mist or vapor from a humidifier).
- People **cannot be infected** with Naegleria fowleri **by drinking contaminated water.**
- Naegleria fowleri infection **does not spread from person to person**, **nor does it manifest symptoms when contracted in other forms.**

Treatment:

- The US-based Centres for Disease Control (**CDC**) **recommends treatment with a combination of drugs**, often including **amphotericin B, azithromycin, fluconazole, rifampin, miltefosine,** and dexamethasone.
- These drugs have been used to treat patients who survived.

Understanding solar flares: How explosions on Sun's surface can lead to radio blackouts

Solar flares

- These are **magnetic plasma ejected** at great speed from the solar surface.
- They occur during the release of magnetic **energy associated with sunspots** ('dark' regions on the Sun that are cooler than the surrounding photosphere), and can last for a few minutes or hours.
- These flares can be divided into various categories based on **their brightness in X-ray wavelengths**

- There **are five different classes of solar flares**: **A, B, C, M, and X.**
- Each class is at least ten times more potent than the one before it.
- X-class flares are large and M-class are **medium-sized flares** typically result in brief radio blackouts that affect the Earth's Polar Regions.
- C-class flares are slight and have little effect on the Earth.

Impact of Solar Flares on Earth

- The energy particles released by solar flares into space impact the ionosphere and radio communications at the Earth.
- They can even affect **power grids and navigation signals** and endanger astronauts and spacecraft.

WHO Raises Deadly Enterovirus Infection Alarm across Europe

Enteroviruses

- Enteroviruses are a **group of viruses that can cause various infectious illnesses** and are responsible for annual epidemics.
- **There are many kinds of enteroviruses**, including coxsackieviruses, echoviruses, polioviruses, and the hepatitis A virus.
- All enteroviruses are **antigenically heterogeneous and have wide geographic distribution.**
- They **can infect anyone**, but are **more likely to cause illnesses in people with weak immune systems, as well as infants**, children, and teens **who don't have immunity against a virus** yet because it's their first exposure to it.
- **Illness is usually mild** but has been f**ound to affect neonates differently and sometimes more severely** than older children and adults.
- **Transmission**: There are **multiple transmission routes**, particularly in the neonatal period, including i**ntrapartum by exposure to maternal blood, secretions, and/or stool, or postnatally from close contacts** with infected caregivers.
- **Symptoms**:
    - **Most people** with an enterovirus infection **don't get sick**.
    - For those who do, symptoms **depend on the type of enterovirus and which part of the body it affects.**
    - **Most often a child will simply have a fever or mild cold symptoms** such as runny nose, sneezing, coughing, or muscle aches.
- **Treatment**:
    - There is **no specific treatment for enterovirus infection.**
    - The **focus is on easing symptoms** until the infection has run its course, which usually takes only a few days.

What is Microsoft's planned 'quantum supercomputer'?

Quantum Computing

- It is an area of computer science that **uses the principles of quantum theory.**
- **Quantum theory explains the behavior of energy and material on the atomic and subatomic levels.**
- Quantum computers have the **capability to sift through huge numbers of possibilities** and **extract potential solutions to complex problems** and

challenges.

- **How does it work?**
  - Where classical computers **store information** as bits with either 0s or 1s, **quantum computers use qubits.**
  - While **classical bits always represent either one or zero**, a **qubit can be in a superposition of one and zero simultaneously** until its state is measured.
  - In addition, the **states of multiple qubits can be entangled**, meaning that they are linked quantum mechanically to each other.
  - **Qubits can be made by manipulating atoms, electrically charged atoms called ions, or electrons, or by nanoengineering so-called artificial atoms**, such as circuits of superconducting qubits, **using a printing method called lithography.**

Superposition and Entanglement

- They are two features of quantum physics **on which quantum computing is based**.
- They **empower quantum computers to handle operations at speeds exponentially higher** than conventional computers **and with much less energy consumption.**
- **Superposition**:
  - **A qubit places the quantum information** that it contains **into a state of superposition.**
  - This refers to a **combination of all possible configurations of the qubit.**
  - **Groups of qubits in superposition can create complex, multidimensional computational spaces.**
  - Complex problems can be represented in new ways in these spaces.
- **Entanglement**:
  - **Pairs of qubits can be made to become entangled.**
  - This means that the t**wo qubits then exist in a single state.**
  - **In such a state, changing one qubit directly affects the other** in a manner that's predictable.
  - **Quantum algorithms are designed to take advantage of this relationship** to solve complex problems.
  - While doubling the number of bits in a classical computer doubles its processing power, **adding qubits results in an exponential upswing in computing power and ability.**

PAU develops new wheat variety to keep diabetes, obesity in check

PBW RS1

- It contains **high amylose starch content.**
- Resistant starch (RS) won't cause an immediate and rapid rise in glucose levels.
- The high amylose and resistant starch, instead, ensure that glucose is released more slowly into the bloodstream.
- Amylose **starch content** known to reduce risks **of type-2 diabetes** and cardiovascular diseases.
- Food prepared from its whole grain **flour also have lower glycemic index**.

Type 2 Diabetes

- It is the condition in which the **human body doesn't use insulin well**and can't keep blood sugar at normal levels.
- It develops over many years and is usually diagnosed in adults (but more and more in children, teens, and young adults).

Glycemic index

- It is a rating system for foods **containing carbohydrates.**
- It shows **how quickly each food affects your blood sugar** (glucose) level when that food is eaten on its own.

IISc. scientists develop composite semiconductor for next-gen foldable phones and wearable devices

- Traditional semiconductor devices – such as **transistors**, the building blocks of most electronic circuits – used in display units are either made of **amorphous silicon or amorphous oxides**, both of which are not flexible and strain tolerant.
- Adding **polymers** to the oxide semiconductors may increase their flexibility, but there is a limit to how much can be added without compromising the semiconductor's performance.
- In the current study, published in Advanced Materials Technologies, researchers have found a way to fabricate a composite containing a significant amount of polymer – up to 40% of the material weight – using a solution-process technique, specifically inkjet printing.
- In contrast, previous studies have reported only up to 1-2% polymer addition. Interestingly, the approach enabled the semiconducting properties of the oxide semiconductor to remain unaltered with the polymer addition.
- The large quantity of polymer made the composite semiconductor highly flexible and foldable without deteriorating its performance.
- The composite semiconductor is made up of two materials – a water-insoluble polymer, such as ethyl cellulose that provides flexibility, and indium oxide, a semiconductor which brings in excellent electronic transport properties.

How researchers came up with the new material

- To design the material, researchers mixed the polymer with the oxide precursor in such a way that interconnected oxide nanoparticle channels are formed (around phase-separated polymer islands) through which electrons can move from one end of a transistor (source) to the other (drain), ensuring a steady flow of current.
- The key to form these connected pathways, the researchers found, was the choice of the right kind of water-insoluble polymer that does not mix with the oxide lattice when the oxide semiconductor is being fabricated.
- This phase separation and the formation of polymer-rich islands helps in crack arrest, making it super flexible.
- Semiconductor materials are usually fabricated using deposition techniques, such as **sputtering**. Instead, Prof. Dasgupta's team uses inkjet printing to deposit their material onto various flexible substrates ranging from plastic to paper. In the present study, a polymer called Kapton was used.

Plans afoot to set up first desalination plant for potable water in Puduhcerry

The Public Works Department (PWD) in Puducherry has planned to set up a one MLD (million litres per day) desalination plant on a pilot basis in the city, to overcome the depletion of groundwater sources and to meet the ever-expanding drinking water requirements of residents in the urban agglomeration limits.

Desalination Plants:

- A **desalination plant** turns salt water into water that is fit to drink.
    - **Desalination** is the process of **removing salts from water** to produce water that meets the quality (salinity) requirements of different human uses.
- Most commonly used **technology** for the process is **reverse osmosis.**
    - An external pressure is applied to push solvents from an area of high-solute concentration to an area of low-solute concentration through a semi-permeable membrane.
    - The **microscopic pores** in the membranes allow water molecules through but leave salt and most other impurities behind, releasing clean water from the other side.
- These plants are mostly set up in areas that have access to **sea water.**
- **Advantage of Desalination Plants:**
    - It can extend water supplies beyond what is available from the **hydrological cycle,** providing an **"unlimited", climate-independent** and **steady supply** of high-quality water.
    - It can **provide drinking water** in areas where no natural supply of potable water exists.
    - As it generally **meets or exceeds** standards for **water quality,** water desalination plants can also **reduce pressure on freshwater supplies** that come from **areas** (over exploited water resources) that need protecting.
- **Disadvantage of Desalination Plants:**
    - **Costly to build and operate** desalination plants as the plants require huge amounts of energy.
        - **Energy costs** account for **one-third to one-half of the total cost** of producing desalinated water.
        - Because energy is such a large portion of the total cost, the **cost is also greatly affected by changes in the price of energy.**
    - **The environmental impact** is another disadvantage to water desalination plants. Disposal of the salt removed from the water is a major issue.
        - This discharge, known as **brine,** can change the salinity and lower the amount of oxygen **(Hypoxia)** in the water at the disposal site, stressing or killing animals not used to the higher levels of salt.
        - In addition, the desalination process **uses or produces numerous chemicals including chlorine, carbon dioxide, hydrochloric acid and anti-scalents** that can be **harmful in high concentrations.**
- **Opportunities:** The environmental problem can be changed into an economic opportunity as:
    - The **discharge (brine)** can also contain **precious elements like**

uranium, strontium as well as sodium and magnesium which have the potential to be mined.
    - **Brine** has been used for **aquaculture,** with **increases in fish biomass of 300%.** It has also been successfully used to cultivate the **dietary supplement Spirulina,** and to irrigate forage shrubs and crops.
- **Use of Desalination Plants in India:**
    - It has largely been limited to countries in the **Middle East** and has recently started being used in parts of the **United States and Australia.**
    - In India, **Tamil Nadu** has been the pioneer in using this technology, setting up two desalination plants near **Chennai in 2010 and then 2013.**
    - The other states that have proposed these plants are **Gujarat and Andhra Pradesh.**

7-year-old Kollam girl affected by rare Brucellosis; shifted to SIT hospital

Brucellosis Disease

- Brucellosis is a **bacterial infection that spreads from animals to people.**
- It is **caused by various Brucella species, which mainly infect cattle**, swine, goats, sheep and dogs.
- Worldwide, **Brucella melitensis is the most prevalent species causing human brucellosis**.
- **Brucellosis is found globally** and is a reportable disease in most countries. It **affects people of all ages** and both sexes.
- However, **Person-to-person transmission is rare.**
- **Transmission**:
    - **Most commonly,** people are infected by **eating raw or unpasteurized dairy products.**
    - **Sometimes**, the bacteria that cause brucellosis can **spread through the air or through direct contact with infected animals.**
- **Symptoms**: Brucellosis typically causes **flu-like symptoms, including fever, weakness, malaise and weight loss.**
- **Treatment**:
    - The infection can **usually be treated with antibiotics.**
    - However, treatment **takes several weeks to months, and the infection can recur**.

What is Guillain-Barre syndrome? All you need to know as Peru declares national emergency amid surge in cases

Guillain-Barre syndrome

- It is a **rare autoimmune disorder** where the body's immune system mistakenly attacks the peripheral nerves.
- It is more common in adults and males, but it can affect people of all ages.
- **Symptoms**
    - The first symptoms of Guillain-Barré syndrome include **weakness or tingling sensations.** They usually start in the legs, and can spread to the arms and face.
    - For some people, these symptoms can lead to paralysis of the legs,

arms, or muscles in the face.

- **Causes**
  - It is often **preceded by an infection.**
  - This could be a bacterial or viral infection.
  - The most frequently associated infections include **Campylobacter jejuni, Epstein-Barr virus (EBV), cytomegalovirus (CMV**), and the bacteria responsible for pneumonia and urinary tract infections.
  - It may also be triggered by vaccine administration or surgery.
- **Diagnosis**
  - There is no known cure for this syndrome.
  - The most commonly used treatment is **intravenous immunoglobulin (IVIG),** which is made from donated blood that contains healthy antibodies.
  - This helps calm down the immune system's attack on the nerves.

Evidence of superbug found in Delhi's stray dogs

Candida auris

- It is a **multi-drug resistant fungus** that is capable of **causing invasive infections** in the human body.
- It was first identified **in Japan in 2009**
- The fungus has been reported in more than 40 countries, including the United States, United Kingdom, South Africa, and Australia.
- **How is it contracted?**
  - It is primarily contracted in **healthcare settings such as hospitals and nursing homes.**
  - It is generally thought to be spread through **contact with contaminated surfaces** or by person-to-person transmission.
  - The fungus can either colonize a specific region of the body, such as the skin, rectum, or mouth, without causing symptoms or it can cause severe invasive infections by entering the bloodstream or wounds.
- **Symptoms**
  - Its symptoms are often similar to those of other common diseases, such **as fever and chills** that do not go away after treatment with antibiotics.
- **Treatment**
  - It is resistance to multiple classes of antifungal drugs.
  - This makes treatment challenging and often requires the use of **combination therapies.**
  - Antifungal drugs called **echinocandins** are used to treat this infection;

New plant species that grows in saline conditions of Kutch discovered

Salsola Oppositifolia Desfontani

- It is a species that belongs to the family of **Amaranthaceae.**
- **Features**
  - It is a **perennial shrub that grows** in saline, arid to semi-arid environments.
  - It is a **succulent shrub** that can grow one to two metres tall and have a smooth, cylindrical, woody base.

  - It is rarely prostrate and unlike other species of Salsola, **does not have any hairs.**
  - As the name oppositifolia suggests, the leaves of this plant grow opposite each other in the stem.
  - It is a **halophyte plant** -a plant adapted to growing in saline conditions.
- This species, earlier known from Italy, Northern Africa, Palestine, Spain and Western Sahara.
- It has been reported for the first time from India based on the collection made from Khadir Bet, Kutch, Gujarat at 15.5-m altitude.
- It is **the sixth species of Salsola genus** to be discovered in India.
- Five other species of Salsola genus which have been recorded in India are **Salsola kali, Salsola hatmanii, Salsola monoptera, Caroxylon imbricatum** (Salsola baryosma) and Halogeton glomeratus (Salsola glomerata).
- Plants of the Salsola genus have salty juice stored in their leaves.
- **Uses**
  - Salsola oppositifolia is used as a raw material for **manufacturing soda ash.**
  - Other Salsola species are used in **manufacturing lye and soaps.**
  - Research has established that the species of this genus are rich in **pharmacological properties also.**

SOCIETY

President of india presents bhoomi samman 2023

- The 9 state Secretaries and 68 District Collectors were presented with "Bhoomi Samman awards who have excelled in achieving saturation of the core components of Digital India Land Records Modernization Programme (DILRMP).

Bhoomi Samman Awards:

- It aims to acknowledge and encourage outstanding performance in the implementation of the **Digital India Land Records Modernization Programme** (DILRMP).
- Madhya Pradesh has secured the first position in the field of Digital India Land Records modernization in the country.
- 15 districts of Madhya Pradesh have been **awarded Platinum Grading** for 100 percent achievement in all the components of Digital India Land Records Management Programme.
- It is a fine example of Centre-State cooperative federalism based on trust and partnership, as the grading system is largely based on reports and inputs of the States/UTs in the core components of computerization and digitization of land records.

DILRMP

- It is a **central sector scheme** being implemented by the Department of Land Resources under the **Ministry of Rural Development.**
- **Aim:** It attempts to build upon the commonalities that exist in the arena of land records in various States to develop an appropriate Integrated Land Information Management System (ILIMS) across the country.
- The ILIMS integrates all the processes and lands records databases with the banks, financial institutions, circle rates, Registration Offices and other sectors.
- **Major components:** Computerization of land records, Survey/re-survey, Computerization of Registration.

Green promise: Silver cockscomb isn't a troublesome weed for Karnataka's Soliga tribe

- For the Soligas, known for their traditional knowledge of ecology, silver cockscomb is a nutritious leafy green vegetable that grows well even on fallow land and in drought-like conditions
- **Silver cockscomb** is a beautiful but troublesome weed. It can spread quickly and suppress the growth of other crops, affecting their yield. It also attracts insects, caterpillars, worms and moths that can harm crops.
- In Karnataka's Chamarajanagara district, where silver cockscomb is referred to as **anne soppu**, farmers of the **Soliga tribe** say controlling the weed can cost up to Rs 2,000 per acre (0.4 hectare) per year. Yet they do not consider silver cockscomb a weed.
- For the Soligas, known for their traditional knowledge of ecology, silver cockscomb is a nutritious leafy green vegetable that grows well even on fallow land and in drought-like conditions.
- Also known as lagos spinach, the weed belongs to the Amaranthaceae family,

which includes economically important plants like spinach (Spinacia oleracea), beetroot and quinoa. The plant is known as Celosia argentea in scientific lexicon, *kurdu* in Marathi and *pannai keerai* in Tamil.

Healthy add-on

- Although it is of the same family as spinach, it does not pose the same risk to kidneys. Spinach leaves are high in calcium, oxalates, vitamin K and potassium, which can impair kidney function and lead to formation of kidney stones.
- In comparison, silver cockscomb leaves have lower levels of oxalic acid (0.2 per cent) and phytic acid (0.12 per cent), says the World Vegetable Center.
- Though scientists are discovering the benefits of silver cockscomb now, communities worldwide have long known its usage and benefits. Believed to have originated in tropical Africa, according to the Royal Botanic Gardens, Kew, UK, silver cockscomb grows abundantly in South and Southeast Asia, Latin America and parts of the US and Australia.

Soligas

- Soligas are an indigenous tribe of Karnataka, inhabiting the peripheral forest areas near Biligiri Rangana Hills and Male Mahadeshwara in the Chamarajnagar district of Karnataka.
- The Soligas were dependent on hunting and shifting agriculture traditionally.
- They are the first tribal community living inside the core area of a tiger reserve in India to get their forest rights officially recognised by a court of law.

Govt's mental health helpline Tele-Manas receives over 2 lakh calls since launch

National Tele Mental Health Programme

- Tele Mental Health Assistance and Networking Across States (Tele MANAS) **has been launched during October 2022.**
- **Aims**: It aims to **provide free tele-mental health services all over the country round the clock**, particularly catering to people in remote or under-served areas.
- There are **42 active Tele Manas cells across 31 states and Union Territories**.
- The service is **accessible through the toll-free numbers** with options to choose **preferred languages** (20 languages included till now).
- Tele-MANAS will be **organised in two tier system:**
    - **Tier 1:** It **comprises of state Tele-MANAS cells** which include **trained counsellors and mental health specialists.**
    - **Tier 2: It will comprise of specialists at District Mental Health Programme (DMHP)/Medical College resources for physical consultation** and/or e-Sanjeevani for audio visual consultation.
- **Services offered by Tele MANAS:**
    - **Tele counselling by trained counsellors**.
    - **Tele Consultation by Mental Health professionals** when required.
    - **Referral Services to other Mental Health Establishments** such as Medical Colleges, District Mental Health Program (DMHP) services and speciality institutes.

National Mental Health Programme (NMHP)

- The Government of India has **launched the National Mental Health Programme (NMHP) in 1982**, with the following objectives:
    - To **ensure the availability and accessibility of minimum mental healthcare** for all in the foreseeable future, **particularly to the most vulnerable** and underprivileged sections of the population;
    - To **encourage the application of mental health knowledge in general healthcare** and in social development;
    - To **promote community participation in the mental health service development** and to stimulate efforts towards self-help in the community.
- The **District Mental Health Program (DMHP) was launched under NMHP in the year 1996.** The DMHP was based on 'Bellary Model' with the **following components:**
    - **Early detection & treatment**.
    - **Training: imparting short-term training to general physicians for diagnosis** and **treatment of common mental illnesses** with limited number of drugs under guidance of specialist. The Health workers are being trained in identifying mentally ill persons.
    - **IEC: Public awareness generation.**
    - **Monitoring**: the purpose is for simple **Record Keeping**.

Jammu To Pioneer India's First Cannabis Medicine Project

Cannabis Medicine Project

- **'Cannabis Research Project' of CSIR-IIIM Jammu is a first of its kind in India initiated under the leadership of Science & Technology Ministry in Private Public Partnership with a Canadian firm**, which has a great potential to put substance of abuse for the good of mankind especially for patients suffering from neuropathies, cancer and epilepsy, malignancies.
- This project of CSIR-IIIM is also important from the perspective of Atma-Nirbhar Bharat as it will be able to **produce export quality drugs meant for different kinds of neuropathies, diabetic pains etc.**
- This project will **explore the therapeutic properties of Cannabis**, a plant which is otherwise prohibited and known for abuse.

Cannabis Cultivation:

- Cannabis, weed, pot, and marijuana all refer to the same group of plants known for their **relaxing and calming effects.**
- Cannabis contains **at least 120 trusted Source active ingredients**, or cannabinoids. The most abundant ones are **cannabidiol (CBD) and delta-9-tetrahydrocannabinol (THC).**
    - Cannabidiol (CBD) - This is a psychoactive cannabinoid, yet it's **non-intoxicating and non-euphoric.**
    - **THC-** This is the **main psychoactive compound** in cannabis.
- **Legal provisions in India:**
    - The **central law** that deals with cannabis is the **Narcotic Drugs and Psychotropic Substances Act, 1985.**
    - The NDPS Act **prohibits the sale and production of cannabis resin and flowers**, but the use of leaves and seeds of the cannabis plant is permitted.

- However, different **states have their own laws** relating to the consumption, possession, sale or purchase of it.
- States like Uttarakhand, Uttar Pradesh, Manipur, Madhya Pradesh and Himachal Pradesh have started making the policy and rules for the use of Cannabis for scientific purposes.

CSIR-Indian Institute of Integrative Medicine(CSIR-IIIM):

- It is the **oldest scientific research institute** in India with a history of discovering mint way back in 1960s, the centre **of purple revolution** and now the Cannabis Research Project.
- It was first established as a research and production centre **in 1941** but later taken over by the Council of Scientific & Industrial Research (CSIR) in 1957.
- **Mandate:** To discover **new drugs and therapeutic approaches from Natural Products**, both of plant and microbial origin, enabled by biotechnology, to develop technologies, drugs and products of high value for the **national and international markets.**

Bengaluru becomes first Indian city to join World Cities Culture Forum

World Cities Culture Forum

- It was founded in **2012 by Justine Simons OBE**, London's Deputy Mayor for Culture & the Creative Industries.
- It is a global network of cities that **share research and intelligence, and explore the role** of culture in future prosperity.
- The network currently **has 40 cities spanning six continents**.
- Bengaluru being the latest addition is set to join the league of cities like New York, London, Paris, Tokyo and Dubai among others.
- World cities **culture summit hosted on a rotating basis** by city partners, an unprecedented gathering of city leaders sharing ideas and knowledge about culture's role in public policy in a world city context.

Bengaluru

- Bengaluru (formerly Bangalore) **is a megacity,** the capital of the Southern state of Karnataka and the fastest growing city in India.
- Its population has grown from one million in 1950 to over 16 million in 2023.
- It is commonly referred to as the **'Silicon Valley of India'** because of its role as the nation's leading information technology exporter,
- It is home to more than **30 government and private museums** that showcase the city's rich history, art and culture.
- Most recently, South India's **first major private art museum**, the Museum of Art and Photography (MAP), opened in February 2023.
- Bengaluru's distinction lies in being a rare city where both North Indian (Hindustani) and South Indian (Carnatic) **classical music thrive.**
- As the "**Garden City of India**", Bangaluru has many green spaces including two nationally recognised botanical gardens**, Lal Bagh and Cubbon Park** that act as green lungs for the city.

Magicpin starts selling tomatoes for Rs 70 per kg through ONDC partners

National Cooperative Consumers Federation of India (NCCF)

- It was **established on 16th October 1965** to function as the **apex body of consumer cooperatives** in the country.

- It is an organization to **promote consumer cooperative movement in the country**, aspires to **facilitate the voluntary formation and democratic functioning of cooperatives**, based on self-reliance and mutual aid for overall economic betterment and financial autonomy.
- It is r**egistered under the Multi-State Co-operative Societies Act, 2002.**
- NCCF **functions under the Ministry of Consumer Affairs,** Food and Public Distribution, Government of India.
- **Headquarters: New Delhi**
- Structure:
    - The **management of NCCF vests in the Board of Directors.**
    - The **ultimate authority** of NCCF vests **in the hands of the General Body.**
    - **Board of Directors exercises all the powers of NCCF except those reserved for General Body.**
    - The current **sanctioned strength of the Board of Directors is 21.**

Open Network for Digital Commerce (ONDC)

- It is an o**pen-source network** set up to **enable buyers and sellers to transact with each other irrespective of the e-commerce platform** on which either of them is registered.
- It will **enable local commerce across segments,** such as mobility, grocery, food order and delivery, hotel booking and travel, among others, **to be discovered and engaged by any network-enabled application.**
- It is an **initiative of the Department for Promotion of Industry and Internal Trade (DPIIT) under the Ministry of Commerce and Industry.**
- It **comprises buyer-side apps w**here consumers can place orders, **seller-side apps** that onboard merchants and display their listings, **and logistics platforms that handle deliveries.**
- **Benefits**:
    - It **offers small retailers an opportunity to provide their services** and goods to buyers a**cross the country** through an e-commerce system.
    - ONDC enables merchants to save their data to **build credit history and reach consumers.**
    - It is expected to **digitise the entire value chain, promote the inclusion of suppliers, derive efficiencies in logistics** and enhance value for consumers.
    - ONDC protocols **would standardize operations** like cataloguing, inventory management, order management and order fulfilment.

In Red Corridor along A.P.-Chhattisgarh border, a tribe keeps its customs, memories alive

- In the dense forest nearly 10 km from the main road on Andhra Pradesh-Chhattisgarh border in Kunavaram mandal of the district, three stone memorials greet visitors to the tiny village of Ramachandrapuram, inhibited by the **Gutti Koya** tribespeople.
- Gutti Koya tribe fleeing the Naxal-hit regions in Chhattisgarh during the 2005-11 conflict between Chhattisgarh government-sponsored Salwa Judum and Naxalites.

- This settlement comprises those who fled the erstwhile Dantewara district of Chhattisgarh and now falls in India's Red Corridor, where Left Wing Extremist groups are still active.
- It is the tribespeople's custom to place a stone in memory of a deceased dignitary of the settlement to express their gratitude for their services. They bury the bodies of only three persons in our village—*Vejji* (physician), *poojari* (priest) and the community head. When others die, their bodies are cremated in the forest.
- When anyone holding these positions die, the villagers will search for a stone (the size of the deceased person) in the nearby stream and bring it to the forest, where it is kept in that person's memory. The family of the deceased dignitary would also organise a feast for the entire villagers for installing the memorial.
- As of now, the village does not have any official graveyard as it did not exist prior to the tribespeople's migration. The villagers have, however, designated a forest patch as their graveyard, where they perform last rites for their dead.
- Under the stone memorial, the family of the deceased has placed a few things that the man loved the most when he was alive—a knife, a sickle, Mahua liquor and some clothes. In every community ritual, liquor extracted from the Mahua flower is kept at the memorial
- The Gutti Koya tribe appoints only men to these positions. They earn a living through animal husbandry and minor forest produce.

Koya Tribe:

- Koya tribe is the **largest adivasi tribe of Telangana** and listed as Scheduled Tribe in Telangana.
- The community is **spread across Telugu speaking states of Telangana and Andhra Pradesh.**
- Koyas popularly call themselves as **Dorala Sattam (Lords group) and Putta Dora (original lords).** Koyas call themselves "Koitur" in their dialect, like Gonds.
- **Habitat and livelihood:**
    - The Godavari and Sabari rivers which are flowing through their area of habitation exercise profound influence on Koyas' economic, social and cultural life.
    - The Koyas are **mainly settled cultivators.** They grow Jowar, Ragi, Bajra and other millets.
- **Language:**
    - Many koya People have forgotten their Koya Dialect and adopted Telugu as their mother tongue but some in other parts still speak Koya dialect.
- **Religion and festival:**
    - Lord Bhima, Korra Rajulu, Mamili and Potaraju are the important deities to Koyas.
    - Their main festivals are Vijji Pandum (seeds charming festival) and Kondala Kolupu (festival to appease Hill deities).
    - Koyas perform a robust colourful **dance called Permakok ata** (Bison horn dance) during festivals and marriage ceremonies.

What it takes to enforce lane discipline on the roads

- Following a public interest litigation by a citizen about road accidents resulting from lane indiscipline, the Madras High Court recently directed the Greater Chennai Traffic Police to put checks in place to combat the problem.
- As per Indian Road Congress standards, Subramanian says, each lane should be 3.5 metres wide. Considering that we need four lanes — one each for cars, two-wheelers, heavy vehicles and a service road — and also footpath space of 1.5 metres on both sides, that is an impossiblity on most roads

'Invest in technology'

- Chandigarh is the closest that I can think of as a city where a system of lane markings has been implemented effectively. The city has roads designed with every stakeholder in mind, which includes cyclists, pedestrians and vendors. This has made the job of the police easier as signboards clearly mention where vehicles can be parked, which lane to take etc.. adding the police there is also proactive in using technology.

Indian Road Congress

- Indian Road Congress (IRC) is the apex body of highway engineers in the country. The IRC was established in December 1934 on the recommendations of the Indian Road Development Committee, popularly known as the Jayakar Committee, set up by the government. Its aim is to develop roads in India.
- The IRC was formally registered as a society under the Societies Registration Act, 1860 on September 24, 1937.
- Established in 1934 with 73 members, the IRC currently has over 50 lakh affiliates (direct/indirect) and over 17,300 registered members, including central and state governments, public sector, research institutes, local bodies, private sector, recipients Engineers and practitioners from all stakeholders of the road sector from multilateral and institutional organizations such as contractors, consultants, equipment manufacturers, machinery manufacturers, material manufacturers and suppliers, industrial associations, World Bank, ADB, JICA, JRA, IRF etc.

Chloride levels posing risk to housing in NCR, experts call for relook of building norms

- While the quality of raw materials, such as cement, steel bars, sand and bricks etc., is vital for residential construction, that of water is often overlooked. However, a report published in early June by the Indian Institute of Technology (IIT), Delhi, has raised concerns over the standard of water used in the National Capital Region.
- In its report, the Department of Civil Engineering, IIT Delhi, said it found chloride in the concrete, noting this could have happened due to "the presence of chloride in water or aggregate used in concrete".
- Chloride, when in contact with water, leads to initiation of corrosion of embedded steel reinforcement

Living dangerously

In February 2022, two women were killed when a sixth-floor apartment in an 18-storey tower of Chintels Paradiso housing society in Gurugram Sector 109 collapsed and the debris fell down to the first floor. The district administration set up a committee to table a report, which found that the affected tower was unsafe for

inhabitation and unfeasible for any repair due to the high chloride levels in the concrete.

Chloride in Drinking Water

- Chloride is a naturally occurring element that is common in most natural waters and is most often found as a component of salt (sodium chloride) or in some cases in combination with potassium or calcium.
- The presence of chloride in groundwater can result from a number of sources including the weathering of soils, salt-bearing geological formations, deposition of salt spray, salt used for road de-icing, contributions from wastewaters and in coastal areas, intrusion of salty ocean water into fresh groundwater sources.
- In PEI, chloride levels in groundwater are relatively usually fairly low, but can become elevated in areas near the coast, or in areas of heavy salting of roads.

What are the health concerns

- Chloride is considered to be an essential nutrient for human health and the main source of chloride is from foods, with drinking water making up only a small portion of normal dietary intake.
- Chloride in drinking water is not harmful, and most concerns are related to the frequent association of high chloride levels with elevated sodium levels. The drinking water guideline for chloride levels of 250 mg/L

International Buddhist Confederation to celebrate Ashadha Purnima as Dharma Chakra Pravartana Divas

Ashadha Purnima

- The day is **also celebrated as Guru Purnima and it falls every year on the full moon day of the month of Ashadha as per the Indian lunar calendar.**
- The day is also **celebrated as Esala Poya in Sri Lanka and Asanha Bucha in Thailand**.
- The day is **remembered for the first teaching of Gautam Budha after attaining Enlightenment to the first five ascetic disciples (pancavargiya) on at 'Deer Park', Risipatana Mrigadaya in the present day Sarnath**, near Varanasi.
- This day is **also aptly observed as Guru Purnima by both Buddhists and Hindus as a day to mark reverence to their gurus**.
- This day also **marks the beginning of the rainy season retreat for the Monks and Nuns also starts with this day.**
- The season **lasts for three months from July to October**. During the season they remain in a single place, generally in their temples dedicated to intensive meditation.

Delhi traffic police's elaborate plan ahead for Kanwar Yatra

Every year, during the Hindu lunar month of Shravan, devotees travel on–foot from GauMukh, Gangotri Dham and Haridwar to offer holy Ganga water at Shiva Temples on Shravan Shivratri

During these days, due to the movement of Kanwarias and setting up of "Kanwar Camps" on roadsides, traffic congestion and obstruction will be experienced at several places.

Kanwar Yatra

- The Kanwar Yatra is a pilgrimage organised in the Hindu calendar month of Shravana.
- Saffron-clad Shiva devotees generally walk barefoot with pitchers of holy water from the Ganga or other holy rivers.
- Devotees carry the pitchers of holy water on their shoulders, balanced on **decorated slings known as Kanwars.**
- The water is used by the pilgrims to worship Shiva lingas at shrines of importance, include the 12 Jyotirlingas, or temples such as the Pura Mahadeva and Augharnath Temple in Meerut, Kashi Vishwanath Temple in Varanasi, Baidyanath Dham in Deoghar, Jharkhand etc.
- An important festival with similarities to the Kanwar yatra in North India, called the **Kavadi festival, is celebrated in Tamil Nadu, in which Lord Muruga is worshipped.**
- The legend of the ritual goes back to the 'samudra manthan', narrated in the Bhagavata Purana.

Jyotirlingas

- A Jyotirlinga is a devotional representation of Shiva.
- There are twelve traditional Jyotirlinga shrines in India.

Iceland is the world's most peaceful country; check where India stands

Global Peace Index

- It is **released annually by the Institute for Economics and Peace (IEP).**
- 2023 Global Peace Index (GPI) **ranked 163 independent states and territories according to their level of peacefulness.**
- It measures the state of peace **across three domains:**
  - **Societal safety and security;**
  - **Ongoing domestic and international conflic**t;
  - **Militarization;**
- **Highlights of Global Peace Index 2023:**
  - The **average level of global peacefulness deteriorated by 0.42 per cent**.
  - I**celand is the most peaceful country in the world** – a title it has held since 2008. It is accompanied at the top by Denmark, Ireland, New Zealand, and Austria.
  - **Conversely, Afghanistan is the least peaceful country in the world** for the eighth consecutive year. It is followed by Yemen, Syria, South Sudan, and the Democratic Republic of the Congo.
  - I**ndia has occupied the 126th spot in the rankings, two higher** than its previous position.
  - The report stated that I**ndia experienced an improvement of 3.5 per cent** in overall peacefulness over the past year, **owing to improvements in violent crime, neighbouring countries' relations, and political instability.**
  - Among other countries, **Nepal, China, Sri Lanka, United States of America, and Pakistan, and have been ranked 79, 80, 107, 131, 146**, respectively.

Performance Grading Index: Punjab, Chandigarh best performers in school

education, says Union edu ministry report

Performance Grading Index

- It was first released for the year 2017-18 and so far it has been released up to the year 2020-21.
- It assesses the **performance of school education system** at the State/UT level by creating an index for comprehensive analysis.
- **Aim of PGI 2.0:** To propel States & UTs towards undertaking multi-pronged interventions that will bring about the much-desired optimal education outcomes covering all dimensions.
- The PGI 2.0 structure comprises of **1000 points across 73 indicators** grouped into 2 categories viz., **Outcomes, Governance Management (GM).**
- These categories are further divided **into 6 domains,**, Learning Outcomes (LO), Access (A), Infrastructure & Facilities (IF), Equity (E), Governance Process (GP) & Teachers Education and Training (TE&T).
- PGI 2.0 for 2021-22 classified the States/UTs into ten grades viz., highest achievable Grade is **Daksh,** which is for State/UT scoring more than 940 points out of total of 1000 points.
- The **lowest grade is Akanshi-3** which is for score up to 460.
- Indicators of PGI 2.0 have been aligned to policy initiatives and interventions introduced post implementation of National Education policy (NEP) 2020 for proper tracking the progress.
- The PGI 2.0 is expected to help States and UTs to pinpoint the gaps and accordingly prioritize areas for intervention to ensure that the school education system is robust at every level.

What is the Farmers Distress Index?

- **Aim:** The main aim behind creating such an index is **to minimise the agrarian distress** in the form of crop loss / failure and income shock.
- The index will try to **anticipate this distress and prevent** its spread from a few farmers to the village or block level by pre-warning different stakeholders, including central, state, local and also non-government agencies.

Methodology to track distress

- The first step will be to **look for incidence of farmers distress** like localised cases of issues with debt repayment, death by suicide, pest attacks, drought, floods, migration, among others.
- Following this, contacts of **marginal and small farmers or tenant farmers** from the area will be collected to conduct telephonic interviews, which will have 21 standardised questions to gauge early signs of distress.
- The answers will be mapped against **seven indicators:**
- Exposure to droughts, floods, crop failure due to pest attacks, livestock deaths
- Debt
- Adaptive capacity of farmer and local government through different schemes
- Land holding and irrigation facilities.
- Sensitivity, mitigation and adaptation strategies like growing of contingency crops if main crop fails.
- Triggers for immediate distress like health-related expenditure.
- Socio-psychological factors and impacts.

What will the index look like

- The index will have **values from 0-1.** A value between 0-0.5 will indicate **'low distress'**, 0.5-0.7 will indicate **'moderate' distress** and above 0.7 will indicate **'severe' distress.**
- If the index is severe, it will identify which component, among the seven, is more severe and contributes maximum to farmers' distress.
- The index is currently being worked out in the form of a mobile or desktop application.
- After completion of the ongoing work, CRIDA will be handing over the index to the central government and it will be made available to different state governments, agriculture departments, rural development departments, agriculture universities

App with live heatmaps to help reduce road fatalities

eDAR Project

- The Integrated Road Accident Database (iRAD) / e-Detailed Accident Report (eDAR) Project is an initiative of the **Ministry of Road Transport and Highways** (MoRTH), Government of India and is **funded by World Bank.**
- **Objective:** The project aims to **develop an Integrated Road Accident Database** (iRAD), to enrich the accident databases from every part of the country.
- The project would generate various types of insights by analysing the collected road accident data across the country through implementation of data analytics technique.

How it works?

- The mobile application will **enable police personnel** to enter details **about a road accident, along with photos and videos**, following which **a unique ID will be created for the incident.**
- Subsequently, an engineer from the Public Works Department or the local body will receive an alert on his mobile device.
- He or she will then visit the accident site, examine it, and feed the required details, such as the road design.
- **Data thus collected** will be **analysed by a team at IIT-M**, which will then suggest if corrective measures in road design need to be taken.

Niti Aayog report claims decrease in multidimensional poverty

- It claims that **about 13.5 crore people** came out of multidimensional poverty during the period, assessed by identifying.
- It said that **rural areas witnessed the fastest decline in poverty** from 32.59% to 19.28%, primarily due to decrease in the number of multidimensionally poor in States such as Bihar, Uttar Pradesh, Madhya Pradesh, Odisha, and Rajasthan. Delhi, Kerala, Goa and Tamil Nadu have the least number of people facing multidimensional poverty
- Along with the Union Territories. Bihar, Jharkhand, Meghalaya, Uttar Pradesh and Madhya Pradesh top the chart where the percentage of total population who are multidimensionally poor is high.
- Multidimensional **poverty in urban areas**, during the same period, **saw a decrease** from 8.65% to 5.27%.

- **Uttar Pradesh** registered the **largest decline** in number of poor with 3.43 crore people escaping multidimensional poverty.
- Between 2015-16 and 2019-21, the MPI value has nearly halved from 0.117 to 0.066 and the intensity of poverty has reduced from 47% to 44%.

National Multidimensional Poverty Index

- It is prepared based on the **latest National Family Heath Survey of 2019-21** and is the second edition of the National Multidimensional Poverty Index (MPI).
- Totally **12 parameters of health, education and standard of living** are examined in the report.
- These include nutrition, child and adolescent mortality, maternal health, years of schooling, school attendance, cooking fuel, sanitation, drinking water, electricity, housing, assets, and bank accounts.
- The report follows **Alkire-Foster methodology** developed by its technical partners -- the **Oxford Poverty and Human Development Initiative** (OPHI) and **United Nations Development Programme** (UNDP).

Centre plans nationwide events under 'Meri Maati Mera Desh' campaign in August

Meri Maati Mera Desh campaign

- Under this campaign **soil collected from different parts of the country** in August will be used to develop a garden along the Kartavya Path in Delhi.
- Events have been planned at the panchayat, village, block, urban local body, and State and national levels, respectively.
- The five-point agenda includes the **installation of a shilaphalakam** (memorial plaque), as per specifications, bearing the "names of those who have made the supreme sacrifice".
- Work for the shilaphalakam may be executed through the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), leveraging local materials and resources.
- **'Vasudha Vandhan'** envisages every gram panchayat or village renewing "**Mother Earth by planting 75 saplings** of indigenous species and developing an Amrit Vatika".
- **'Veeron Ka Vandan'** will **felicitate freedom fighters**, and the families of deceased freedom fighters.
- Young volunteers and others will collect soil from every panchayat/village and bring it to the block, from where the **'Mitti Kalash'** will be transported to Delhi.
- In urban areas, events will be organised at local bodies, notified area councils, Cantonment Boards, and town panchayats from August 9 and 15, and in bigger municipalities and municipal corporations from August 16 to 20.
- The 'Mitti Kalash' are to be brought ceremoniously to the larger municipalities/corporations and transported to Kartavya Path.

What is Urea Gold launched by PM Modi in Rajasthan's Sikar ahead of polls

Urea Gold

- It is a **new variety of Urea coated with Sulphur.**
- It is being introduced to **address the Sulphur deficiency in soil** and **save**

input costs for the farmers.

- Urea Gold **surpasses the existing Neem-coated urea in terms of both economic viability and efficiency.**
- **How Urea Gold Is Better Than Others?**
    - Sulphur-coated urea facilitates a **gradual release of nitrogen**, thereby **enhancing its availability and uptake by crops.**
    - The **inclusion of humic acid** in Urea Gold further **extends its lifespan as a fertilizer.**
    - This product **not only substitutes traditional urea consumption** but also **reduces overall fertilizer usage.**
    - According to the report, 15 kg of Urea Gold provides comparable benefits to 20 kg of conventional urea, making it a more efficient and effective choice for farmers.

Neem-coated urea

- **Urea is a commonly used nitrogen-based fertilizer** that provides essential nutrients to plants to promote healthy growth.
- **Neem-coated urea** is a specialized form of **urea fertilizer that has been coated with neem oil.**
- **Benefits:**
    - The neem coating on urea **slows down the release of nitrogen into the soil**. This controlled release **helps reduce nitrogen leaching and volatilization**, leading to **improved nitrogen use efficiency by plants.**
    - It would **bring down the quantity of urea per acre** and consequent **reduction in input cost to farmers.**
    - The **emission of nitrous oxide is also brought down significantly**.
    - **Neem oil**, derived from the neem tree (Azadirachta indica), **has natural pesticidal properties.**

DEFENCE & SPACE

India-made C295 to start rolling out 2026 from Vadodara, says Airbus

C295 Transport Aircraft

- It is a **new-generation tactical airlifter in the light and medium segment** that will **replace the ageing Avro aircraft of the Indian Air Force.**
- It was **designed and built by Airbus**, a **European multinational aerospace corporation**.
- It is robust and reliable but also **highly versatile in terms of the number of different missions it can perform**.
- The aircraft, with a **flight endurance of up to 11 hours**, can carry out **multi-role operations under all weather conditions.**
- It has a **rear ramp door for quick reaction** and **para-dropping of troops and cargo**.
- **Short take-off/land from semi-prepared surfaces** is another of its features.
- **Types of Missions:**
    - It is known to be a superior aircraft **used for tactical transport of up to 71 troops or 50 paratroopers.**
    - **Air-to-Air refuelling**: It **can be converted into an air tanker** that can **deliver up to 6,000 kg of gasoline to fixed and rotary wing receivers** by adding a detachable refuelling kit.
    - **Airborne Early Warning (AEW**): It has a **cutting-edge radar with 360-degree coverage t**o give a complete picture of the airspace in its **Airborne Early Warning variant.**
    - **Water-Bomber**: It can be **transformed into a powerful water bomber that can put out forest fires with up to 7,000 litres of water** due to a flexible roll-on/roll-off system.
    - **Armed/Ground ISR (Intelligence Surveillance and Reconnaissance**): A close-air-support operation that **uses an ISR with a multi-mission radar** that can also be weaponized.
    - The aircraft can be **utilised for casualty or medical evacuation** as well as airdropping loads and paratroopers.
    - It is equipped to **handle special missions, disaster relief operations, and maritime patrol responsibilities.**

European satellite being made to crash intentionally on Earth

Aeolus Wind Satellite

- Aeolus is a satellite mission **launched by the European Space Agency (ESA) to study Earth's winds and their influence** on the planet's climate and weather patterns.
- The mission is **named after Aeolus, the ruler of the winds in Greek mythology**.
- Aeolus was **launched on August 22, 2018**, **from the Guiana Space Centre** in French Guiana.
- It is a **1,360-kilogram satellite**.
- **Mission Objectives:**
    - The primary goal of the Aeolus mission is to **measure global wind profiles from space.**

- It aims to **provide accurate and comprehensive data on wind patterns** in the Earth's atmosphere **to improve weather forecasting, understand climate dynamics**, and enhance our **knowledge of the Earth's atmospheric circulation**.
- It is the **first satellite mission to acquire profiles of Earth's wind on a global scale**.

- **Instrumentation**:
  - Aeolus is equipped with a **single instrument called the Atmospheric Laser Doppler Instrument (ALADIN).**
  - ALADIN is a **Doppler wind lidar**, which stands for **Light Detection and Ranging**, that will **measure the winds sweeping around the planet**.

North Korea fires 'several cruise missiles' into sea

Yellow Sea

- It is a **marginal sea of the western Pacific Ocean.**
- **Location:**
  - The Yellow Sea is **situated between mainland China to the west and north**, the **Korean Peninsula to the east**, and the **Shandong Peninsula and Liaodong Peninsula to the south.**
  - It **connects with the Bohai Sea to the northwest**.
- **Size**: Also referred to in China as Huang Hai and in North and South Korea as the West Sea, the Yellow Sea is **870 kilometres long and 556 kilometres wide.**
- **Depth**: It is **one of the largest shallow areas of continental shelf** in the world with an **average depth of 44 metres** and a **maximum depth of 152 metres**.
- **Inflow**: Several major rivers, including the **Yellow River and the Yangtze River**, discharge into the Yellow Sea, carrying significant amounts of sediment and nutrients.
- **Islands**: The Yellow Sea is dotted with numerous islands, the largest of which include **Jeju Island (South Korea**), **Shandong Peninsula islands (China**), and **Ganghwa Island (South Korea).**
- **Climate**: The climate is characterized by **very cold, dry winters and wet, warm summers.**
- **Currents**:
  - The **warm current of the Yellow Sea is a part of the Tsushima Current**, which **diverges near the western part of the Japanese island of Kyushu** and **flows** at less than 0.5 mile (0.8 km) per hour northward **into the middle of the sea.**
  - **Along the continental coasts**, **southward-flowing currents prevail**, **which strengthen markedly in the winter monsoon period**, when the water is cold, turbid, and **of low salinity.**

Indian group proposes radical new way to settle universe expansion dispute

A group of scientists may have found a way to determine the rate of expansion of the universe also known as the Hubble constant.
Two details are required to calculate the value of the Hubble constant: the distance

between the observer and astronomical objects, and the velocity at which these objects are moving away from the observer as a result of the expansion of the universe. So far, scientists have used three methods to get these details

Hubble Tension and Hubble Constant

- Astrophysicists have known about the expansion of the Universe for about 100 years. However, scientists disagree about the rate of the expansion, a problem known as the "**Hubble tension.**" The problem results from a disagreement between two methods used to measure the Hubble constant.
- One of the major problems of cosmology has been to **determine the value of the Hubble constant.** The tension arises because **the various methods applied to determine its value have yielded different values of what, in the end, must be a single number**.
- The Hubble constant (or Hubble–Lemaître constant) is the name given to the **present expansion rate of the Universe.**
- The Hubble constant (H0) is named after the astrophysicist who, together with Georges Lemaitre, discovered the phenomenon in the late 1920s.
- It's measured in **kilometers per second per megaparsec (km/s/Mpc),** where 1 Mpc is around 3.26 million light years.
- The current best direct measurement of the Hubble constant is 73.8 km/sec/Mpc (give or take 2.4 km/sec/Mpc including, both random and systematic errors), **corresponding to a 3% uncertainty.**

Eye On China, India Hands Over Missile Corvette INS Kirpan To Vietnam

Cam ranh bay

- **Location**: Cam Ranh Bay is a **deep-water bay** located in Khánh Hòa Province, **Vietnam, on the South China Sea.**
- **Size**: It is approximately **20 miles (32 km) long from north to south** and up to **10 miles (16 km) wide.**
- **Depth**: The bay is up to **164 feet (50 m) deep**, making it **one of the deepest natural harbours in Southeast Asia.**
- **Facilities**: The port has **two main piers, one for general cargo and one for oil tankers.** It also has a number of other facilities, including a **repair yard, a fuel depot, and a container terminal.**
- It is a **major refuelling and repair station for ships** in the South China Sea.
- **Historical Significance:**
    - **During the colonial era**, it was **controlled by the Champa Kingdom** and later **became part of the Vietnamese territories**.
    - In the **19th century**, the **French established a major military presence** in the bay.
    - **During the Vietnam War**, Cam Ranh Bay gained significant importance as a **strategic military base for both the United States and South Vietnam**. The **United States constructed extensive facilities**, including an airbase and a deep-water port, **to support its military activities during the war**.
    - **Following the end of the Vietnam War** in 1975, Cam Ranh Bay **came under the control of the Socialist Republic of Vietnam.**
    - The **Soviet Union subsequently leased** the former American facilities **and established a major naval base there.**

- The **Soviet Navy maintained a presence** in Cam Ranh Bay throughout the Cold War **until the early 2000s.**

INS Kirpan

- It is an **indigenously-built in-service missile Corvette.**
- It is a **Khukri class missile corvette commissioned** into the Navy **on January 12, 1991.**
- **Features**:
  - It has a **displacing capacity of** close to **1,400 tonnes.**
  - It is capable of a **speed of more than 25 knots.**
  - The Khukri class are **equipped with Diesel Engines assembled in India**.
  - The ship is fitted with a **medium-range gun, 30 mm close-range guns**, chaff launchers, and surface-to-surface missiles.
  - It performs a **wide variety of roles**, including **coastal and offshore patrol**, coastal security, **surface warfare, anti-piracy**, and Humanitarian Assistance and Disaster Relief (HADR) operations.

Indian Navy equipping ships with cutting-edge 'Made in India' tech

Software Defined Radio (SDR)

- SDR is a **radio communication system that employs reconfigurable software-based components for the processing and conversion of digital signals.**
- Unlike traditional radio communication systems, these radio devices are **highly flexible and versatile.**
- This is an **emerging technology** used to connect ever-increasing wireless world.

Software-Defined Radio Tactical (SDR-Tac):

- Equipped with several multimedia capabilities, the **indigenous SDR-Tac provides real-time voice, data and video information.**
- It is **built indigenously by the Navy's Weapons and Electronics Systems Engineering Establishment (WESEE).**
- **What does SDR-Tac do?**
  - SDR-Tac is a **four-channel multi-mode**, **multi-band, 19-inch rack-mountable, ship-borne software-defined radio system.**
  - It is intended to **serve ship-to-ship, ship-to-shore, and ship-to-air voice-data communication** for network-centric operations.
  - It **supports the simultaneous operation of all four channels** covering V/UHF- and L-Band.
  - This SDR system **houses multiple types of waveforms for narrow-band and wide-band applications.**
  - **Each ship will act as a relay wherein the data can jump from one ship to another.**
  - **To transfer voice, data or video, the link device picks up the best-suited available network. It ensures that data reaches its destination.**

China successfully tests high-thrust engine for moon landing

Long March 10 Rocket

- It is **China's new carrier rocket** designed for **manned moon landing missions.**
- The rocket will be **capable of ferrying a crew module along with a lunar lander to Earth-Moon transfer orbit.**
- **Features:**
    - It has a **modular design,** consisting of a **service capsule, a return capsule and an escape tower,** making it like a **miniature space station on its own.**
    - The command module and living quarters form one half, while the energy and the power modules form the other half.
    - The flexible approach **allows for components to be reused.**
    - The crew capsule has been designed for operations in orbit around the Moon, as well as the Earth. The **crew module has a capacity of between four and seven humans.**
    - The vehicle will **use liquid hydrogen, liquid oxygen and kerosene as propellants.**
    - It will have a **length of 92 meters,** and will be able to **deliver a minimum of 27 tonnes to the Earth-Moon transfer orbit**.
    - There is a**lso a configuration of the vehicle without a booster that can ferry Taikonauts** (Chinese word for astronaut) **to the Tiangong space station**.

Tiangong space station

- **Tiangong** (Chinese for "Heavenly Palace") is a **modular space station being constructed by the China National Space Administration (CNSA).**
- It is the **first space station built by China**.
- Tiangong is **currently in low Earth orbit (LEO**), and it is expected to be operational until 2028.
- It is a **three-module space station.** The **core module Tianhe launched in April 2021**, followed by the Wentian and Mengtian experiment modules in 2022.
- The station is about the **size of the International Space Station (ISS),** and it can **accommodate up to three astronauts.**
- China is **only the third country to have put both astronauts into space and to build a space station,** after the Soviet Union (now Russia) and the US.

Hubble Sees Boulders Escaping from Asteroid Dimorphos

DART Mission

- **NASA's DART mission** was a **spacecraft designed** to test a method of **deflecting an asteroid for planetary defense, using the "kinetic impactor" technique** (in simplest terms means **smashing a thing into another thing**).
- DART was the **first-ever space mission to demonstrate asteroid deflection** by kinetic impactor.
- **The target** of the spacecraft **was a 160-meter-wide asteroid known as Dimorphos**, which is a **moonlet in orbit around the larger asteroid, Didymos**.
- It was **launched in November 2021.**
- DART spacecraft **successfully collided with Dimorphos on 26 September**

2022, altering the asteroid's orbit by 33 minutes.
- It is the **first-time humanity intentionally changed the motion of a celestial object** in space.

Boulders
- It is a **geological term for a rock fragment that is larger than 25.6 centimetres** (10.1 inches) in diameter.
- Boulders **can be made up of various types of rocks**, including igneous, sedimentary, and metamorphic rocks.
- The **composition** of a boulder **depends on the geology of the area** in which it formed.

ISRO to launch PSLV-C56 carrying Singapore's DS-SAR and six other satellites on July 30

PSLV-C56
- The PSLV-C56 carrying DS-SAR satellite along with six co-passengers will be launched from the Satish Dhawan Space Centre in Sriharikota.
- It is configured in **its core-alone mode**, similar to that of C55.
- It would launch DS-SAR, a 360 kg satellite into a Near-equatorial Orbit (NEO) at 5 degrees inclination and 535 km altitude.
- *DS-SAR satellite*
    - It is developed under a partnership between DSTA (representing the Government of Singapore) **and ST Engineering.**
    - It will be used to support the satellite imagery requirements of various agencies within the Government of Singapore.
    - ST Engineering will use it for multi-modal and higher responsiveness imagery and **geospatial services for their commercial customers.**
    - It carries a Synthetic Aperture Radar (SAR) payload developed by Israel Aerospace Industries (IAI).
    - This allows the DS-SAR to provide for all-weather day and night coverage and is capable of **imaging at 1m resolution at full polarimetry.**
- Along with DS-SAR, the PSLV-C56 will carry
    - **VELOX-AM:** A 23 kg technology demonstration microsatellite.
    - **ARCADE** : Atmospheric Coupling and Dynamics Explorer (ARCADE), an experimental satellite.
    - **SCOOB-II:** A 3U Nano satellite flying a technology demonstrator payload;
    - **NuLIoN** : An advanced 3U Nano satellite enabling seamless IoT connectivity in both urban and remote locations;
    - **Galassia-2:** A 3U Nano satellite that will be orbiting at low earth orbit.
    - **ORB-12 STRIDER:** Satellite is developed under an International collaboration.

President & Prime Minister pay tribute to armed forces on Kargil Vijay Diwas

Kargil Vijay Diwas
- It is celebrated on **July 26 every year.**
- The day **commemorates the victory of the Indian armed forces in the Kargil War** fought against Pakistan.

- The day is observed to **pay tribute and honour the bravery and sacrifice of the soldiers** in the war of 1999.
- The year **2023 marks the 24th anniversary** of Kargil Vijay Diwas.

Kargil War

- It was **fought between India and Pakistan at the Line of Control (LoC)in the Kargil district** of Jammu and Kashmir.
- **Surprise Attack:**
  - The Kargil War was an unexpected **intrusion by Pakistani forces into Indian territory.**
  - They **occupied key vantage points in the Kargil region**, leading to intense military engagements.
- **Codename Operation Vijay:** The Indian Army fought bravely and **recaptured the famous 'Tiger Hill' and other important posts around under 'Operation Vijay'** by evicting the Pakistani troops in the 1999 Kargil War.
- **High Altitude Warfare:** It was fought at **extreme altitudes**, with some of the battlegrounds **reaching heights of over 18,000 feet**.
- **Duration**: It lasted for approximately **three months.**
- **Armaments**:
  - The **Indian Army employed heavy artillery**, **air power** as well as major **infantry operations** during the Kargil War.
  - **In a first, the Indian side used the Bofors FH-77B howitzers** to shoot down enemy positions nested at top of the mountains.
  - **Israel provided their Unmanned Aerial Vehicles (UAVs)** to India during the conflict.
- It was the **first ever war to be broadcasted live on TV** channels in India.
- **The End of Conflict:** The war came to an end on **July 26, 1999,** when **India successfully pushed back the Pakistani forces** from the occupied positions.
- **Casualties**: As per official figures, **around 500 Indian soldiers** laid down their lives while **at least 1,000 Pakistani troops** were also killed.
- It was the **last war that happened between India and Pakistan.**

BHEL synchronises 660 MW Unit-2 of Maitree thermal power project in Bangladesh

Maitree Super Thermal Power Project (STPP)

- **Location**:
  - It is a **1,320MW coal-fired power station** under construction in **Rampal, Bangladesh.**
  - It is being developed on an 1,834-acre site on the **bank of Passur River,** approximately **14km away from the Sundarbans.**
- It is being **developed by Bangladesh India Friendship Power Company (BIFPCL),** a **50:50 joint venture** between **India's state-run National Thermal Power Corporation (NTPC)** and **Bangladesh Power Development Board (BPDB).**
- The construction of the **project commenced in April 2017**.
- It will be **one of the biggest coal-fired power plants in Bangladesh**, along with the Payra Power Plant in Pataukhali, which commenced test production in January 2020.
- **Plant make-up:**

- The plant will **consist of two ultra-supercritical coal-fired units** of **660MW capacity each.**
- It will have a **stack height of more than 275m.**
- The design features a **twin-flue steel-lined reinforced concrete chimney**.
- Both the units will be **equipped with flue gas desulfurization (FGD)** and **dry bottom ash-handling systems to control emissions.**

- **Finance:**
  - It is being financed through a **£1.3bn ($1.6bn) loan from** the Export-Import **(EXIM) Bank of India.**
  - **BIFPCL entered into a loan agreement with the EXIM** Bank of India in March 2017.
- **Contractors involved:**
  - **BHEL was awarded** an engineering, procurement, and construction **(EPC) contract worth £1.15bn ($1.5bn)** for the plant **in July 2016.**
  - **BHEL subcontracted global technology company GE for the supply of pressure part components** for the project in May 2017.

NASA's IXPE Discovers Twisted Magnetic Field Fueling a Distant Black Hole's Energetic Jet

Markarian 421

- It is a **supermassive black hole** firing a jet of high-energy particles aimed directly at Earth.
- It is about 400 million light-years away from the earth
- It is located in the **constellation Ursa Major.**

Supermassive black hole

- They have a mass greater than about **50,000 times the mass of our sun.**
- These black holes are far too large to have formed from the gravitational collapse of a single star.
- These are **always found at the centre of a galaxy** and almost all galaxies have a supermassive black hole at its centre.

Imaging X-ray Polarimetry Explorer (IXPE)

- It is an international collaboration **between NASA and the Italian Space Agency.**
- It studies the **most extreme and mysterious objects in the universe** – supernova remnants, supermassive black holes, and dozens of other high-energy objects.
- It is the first satellite dedicated to measuring **polarized X-rays from objects**, such as neutron stars and supermassive black holes, to reveal previously hidden details of the universe.

Rare Ureilite Meteorite formed Dhala structure in MP

Ureilite

- 'Ureilites' are a rare **class of primitive meteorites** that constitute just a **tiny fraction of meteorites on Earth.**
- It is **named after the locality** where the **first specimen was discovered**, **the Novo Urei village in Russia.**
- **Composition**:

    - They **consist of silicate rock**, **mostly olivine and pyroxene**, **interspersed with less than 10% of carbon** (diamond or graphite), **metal sulphides and a few fine-grained silicates.**
    - They contain **elongated cavities** generally **stretched in the same direction**.
    - **Lack of Chondrules**: **Unlike many other stony meteorites**, **ureilites do not contain chondrules**, which are small, spherical grains that formed in the early solar system.
- **Primitive Nature**: Ureilites are considered primitive meteorites **because their composition closely resembles the material from which the solar system formed**.

Dhala Crater

- It is the **oldest and the largest impact crater in India.**
- It is estimated to have **formed some 2500 million years ago.**
- **Named after the village Dhala**, the crater is an eroded leftover of the original impact structure.
- **Location**: It is located in **Shivpuri district in Madhya Pradesh.**
- **Size**: It is a massive **11 km in diameter**, making it the **largest in Asia.**

Meteor, a meteoroid, and a meteorite

- **Meteoroids**: They are **objects in space** that range in **size from dust grains to small asteroids.**
- **Meteors**: **When meteoroids enter Earth's atmosphere** (**or that of another planet**, like Mars) at high speed **and burn up**, **the fireballs or "shooting stars" are called meteors**.
- **Meteorite**: When a **meteoroid survives a trip through the atmosphere and hits the ground, it's called a meteorite.**

Osiris-Rex adjusts course to get closer to Earth with asteroid samples

OSIRIS-REx

- **It is a NASA spacecraft mission** designed to **study the near-Earth asteroid called Bennu.**
- The name OSIRIS-REx stands for "**Origins, Spectral Interpretation, Resource Identification, Security, Regolith Explorer.**"
- **Goal**: To **collect a sample weighing at least 2.1 ounces** (59.5 grams) **from** asteroid 101955 **Bennu** (formerly known as 1999 RQ36) and then **bring the sample to Earth.**
- The mission will **help scientists investigate how planets formed** and how life began, as well as **improve our understanding of asteroids** that could impact Earth.
- It is the **first U.S. spacecraft to collect a sample from an asteroid.**
- It was **launched on Sept. 8, 2016.**
- It **reached its asteroid target in 2018 and is bringing a small sample to Earth** for study.
- The samples **will arrive on Earth in 2023**. **An extended mission will take the spacecraft into** orbit around **near-Earth asteroid Apophis in 2029.**

Asteroid Bennu

- It is located about **200 million miles away** from the Earth.
- It was **discovered by** a team from the **NASA-funded Lincoln Near-Earth**

Asteroid Research team in 1999.

- **It is a B-type asteroid**, implying that it **contains significant amounts of carbon and various other minerals.**
- Around **20-40 percent of Bennu's interior is empty space,** and scientists believe that it was **formed in the first 10 million years of the solar system's creation**, implying that it is **roughly 4.5 billion years old**.
- Bennu is **believed to have been born in the Main Asteroid belt** between Mars and Jupiter, and because of gravitational tugs from other celestial objects and the slight push asteroids get when they release absorbed sunlight, **the asteroid is coming closer to Earth.**

Asteroid

- An asteroid is **a small rocky object that orbits the Sun.**
- These objects are **remnants from the early formation of our solar system**, dating back billions of years.
- **Most asteroids are found in the region between the orbits of Mars and Jupiter, known as the asteroid belt**, but they can **also be found in other regions** of the solar system.

Indigenously-built Indian naval ship to visit Sri Lanka

- Indian naval ship '**Khanjar**', an indigenously-built Missile Corvette of the Khukri class, will make a three-day visit to Sri Lanka's eastern harbour of Trincomalee from Saturday to further people-to-people connect and familiarise the people with the Indian Navy.
- The visit is significant in view of the potential for cooperation between India and Sri Lanka for augmenting the capabilities of the Sri Lanka Navy for efficiently addressing shared challenges for maritime security in the region

Indigenous Destroyer INS Visakhapatnam Docks In Oman's Muscat For Maritime Cooperation

- It is the l**ead ship and the first of the Indian Navy's Visakhapatnam-class stealth guided-missile destroyers.**
- It was **commissioned on November 21, 2021,** is one of the largest destroyers in Indian Navy service.
- **Features:**
    - **Size**: It measures **163m in length, 17m in breadth.**
    - **Displacement: 7,400 tonnes.**
    - **Propulsion**: It is propelled by **four powerful Gas Turbines**, in a Combined Gas and Gas (COGAG) configuration.
    - **Speed**: It is capable of achieving speeds in **excess of 30 knots.**
    - The ship has e**nhanced stealth features** resulting in a r**educed Radar Cross Section (RCS)** achieved through efficient shaping of **hull, full beam superstructure design**, **plated masts and use of radar transparent materials** on exposed decks.
    - The ship is e**quipped to fight under Nuclear, Biological and Chemical (NBC) warfare conditions.**
    - Named after the historic city of Andhra Pradesh on the east coast, Visakhapatnam, the 'City of Destiny', the ship has a **total complement of about 315 personnel.**

NASA's spacecraft Voyager 2 'unable to receive commands or transmit data back to Earth'

Voyager 2 Spacecraft

- It is a space probe launched by NASA on August 20, 1977.
- It is **part of the Voyager program**, which **also includes Voyager 1.**
- P**rimary mission:** To **study the outer planets of our solar system and their moons**, and then **continue on an interstellar mission.**
- It is the **second spacecraft to enter interstellar space.** On Dec. 10, 2018, the spacecraft **joined its twin—Voyager 1**—as the **only human-made objects to enter** the space between the stars.
- It c**arries a Golden Record, a phonograph record** containing sounds and images from Earth, intended **to be a message to any potential extraterrestrial civilizations** it might encounter in the future.
- **Firsts**:
    - It is the o**nly spacecraft to study all four of the solar system's giant planets** at close range.
    - It **discovered a 14th moon at Jupiter.**
    - It was the **first human-made object to fly past Uranus.**
    - **At Uranus,** Voyager 2 d**iscovered 10 new moons and two new rings.**
    - It was the f**irst human-made object to fly by Neptune.**
    - **At Neptune,** Voyager 2 **discovered five moons, four rings, and a "Great Dark Spot."**

Interstellar Space

- Interstellar space, also known as **interstellar medium or interstellar void**, is the **vast expanse of space that exists between stars in a galaxy.**
- It is the region of space **beyond the influence of any individual star's gravity and magnetic fields.**
- It is primarily **composed of very low-density gas, dust, cosmic rays, and magnetic fields.**

Two Indian military aircraft visit Australia's strategic Cocos Islands

Cocos (Keeling) Islands

- The Cocos (Keeling) Islands lie in the **eastern Indian Ocean**, about 2,900 kilometers (1,800 miles) northwest of the **Australian city of Perth.**
- It comprises of coral atolls and islands, the archipelago includes **North Keeling Island and the South Keeling Islands.**
- The territory's administrative headquarters are on West Island in the southern atoll.
- **Climate:** Warm and humid climate.
- **Vegetation:** The vegetation consists chiefly of coconut palms, which were formerly cultivated for copra on plantations.
- The northern atoll consists of Australia's most remote Commonwealth National Park, the **Pulu Keeling National Park.**
- On North Keeling and Horsburgh islands, coarse grass serves as a ground cover.
- The **inhabitants** of this Island are predominantly the descendants of the original plantation workers, **mostly of Malay origin.**
- **Administration:** An administrator appointed by the Australian governor-

general is the senior governmental official in the Cocos. The islands became an Australian territory under the Cocos (Keeling) Islands Act 1955.

Nord Security joins the United Nations Global Compact

United Nations Global Compact (UNGC)

- UNGC is a **call to companies** everywhere t**o align their operations and strategies with Ten Principles in the areas of human rights, labour, environment and anti-corruption.**
- **Launched in 2000**, UNGC is the **largest corporate sustainability initiative in the world**, with more than 15,000 companies and 3,000 non-business signatories based in over 160 countries, and more than 70 Local Networks.
- This **UN-led initiative promotes activities that contribute to sustainable development** goals to create a better world.
- **The Ten Principles of the UN Global Compact:**
    - **Derived from core United Nations conventions and declarations**, the Ten Principles of the UN Global Compact a**re recognized and endorsed in numerous intergovernmental resolution**s and outcome documents, **including General Assembly resolutions.**
    - **Companies that join** the compact **are expected to integrate these principles into their corporate strategies**, culture, and day-to-day operations.
    - Companies are **also expected to advocate the principles publicly** and communicate with stakeholders on progress toward meeting the principles.
    - **Any company that commits to upholding the principles may join the compact**, **which is not legally binding** and is purely voluntary.
    - **The 10 principles for businesses**, as stated on the UN Global Compact's website, **are the following:**
    - **Human Rights:**
        - **Principle 1:** Businesses should **support and respect** the protection of internationally proclaimed **human rights**; and
        - **Principle 2:** make sure that they are **not complicit in human rights abuses.**
    - **Labour**:
        - **Principle 3**: Businesses should **uphold the freedom of association** and the effective **recognition of the right to collective bargaining**;
        - **Principle 4**: the **elimination of all forms of forced and compulsory labour**;
        - **Principle 5**: the effective **abolition of child labour**; and
        - **Principle 6**: the **elimination of discrimination** in respect of employment and occupation.
    - **Environment**:
        - **Principle 7:** Businesses should support a **precautionary approach to environmental challenges;**
        - **Principle 8:** undertake initiatives to promote greater **environmental responsibility**; and
        - **Principle 9:** encourage the development and diffusion of

environmentally friendly technologies.

- **Anti-Corruption:**
  - **Principle 10:** Businesses should **work against corruption in all its forms**, including extortion and bribery.

Defence ministry inks Rs 2,725 cr contract with MDL for refit of submarine

- It belongs to **Shishumar class** of submarines and has a speed of 22 knots.
- It is a **Sub-Surface Killer** (SSK) Class **diesel-electric** submarine.
- These submarines are developed by the German yard Howaldtswerke-Deutsche Werft (HDW).
- The first two of these vessels (INS Shishumar and Shankush) were built by HDW at Kiel, while the remainder (Shalki and Shankul) have been built at **Mazagon Dock Limited (MDL) Mumbai.**
- The ships were commissioned between 1986 and 1994.
- These submarines have a **displacement capacity of 1660 tons** when surfaced.

Submarines

- Submarines are any naval vessel that is capable of propelling itself beneath the water as well as on the water's surface.
- This is a unique capability among warships, and submarines are quite different in design and appearance from surface ships.

NASA Welcomes India as 27th Artemis Accords Signatory

Artemis Accord

- Artemis, named after the **Greek Moon goddess,** represents a comprehensive agreement drawn up by the US to bring together nations that share a common vision for civil space exploration.
- It serves as a framework for cooperation and collaboration in space exploration, building upon the foundation of the **Outer Space Treaty of 1967.**
- The Artemis Accords were jointly launched by the United States Department of State and NASA on October 13, 2020, with seven partner countries, such as **Canada, Italy, Japan, Luxembourg, UAE, and the UK**.
- The Accords have been signed by 26 countries as of June 23, including the original eight. These include traditional US allies like **Japan, Australia, the UK, France,** and **Canada**, but also countries with relatively less developed space programmes like **Colombia, Rwanda, Nigeria,** and **Mexico**.
- The principles of the Artemis Accords include
  - peaceful exploration,
  - full transparency in space activity,
  - including public release of scientific data,
  - interoperability of systems to enhance safety and sustainability,
  - emergency assistance to personnel in distress,
  - preserving outer space heritage,
  - extracting and utilising space resources in compliance with the Outer Space Treaty, and
  - The safe disposal of orbital debris.
- The Artemis programme includes plans for a **base on the lunar surface**,

multiple spacecraft to ferry humans and **cargo**, an orbiting space station, and a constellation of satellites to help with navigation and communication. The first Artemis crewed mission to the moon's surface is likely in 2026.

- NASA is also keen to emphasise that the Artemis programme will take the first woman, and the "**first person of colour**", to the moon.
- By joining the Artemis Accords, ISRO gains access to valuable technologies and opportunities for scientific and technological advancements. Collaboration with NASA would enable **knowledge-sharing and technology transfer** and **enhance India's space exploration efforts.**
- The joint mission to the **International Space Station (ISS)** in 2024, coupled with the **Gaganyaan human module flights,** would set the stage for India to raise its space aspirations

Scientists discover that universe is awash in gravitational waves

Gravitational Waves

- Gravitational waves were first detected in 2015 using an experiment involving Laser **Interferometer Gravitational Observatory (LIGO)** detectors.
- But those waves were of high frequency and believed to have been produced by the merger of two relatively small black holes that took place about 1.3 billion years ago.
- Scientists have been looking for low-frequency gravitational waves for decades. They believed that such ripples are perpetually rolling through space like **background noise.**
- **Pairs of supermassive black holes,** sitting at the centre of galaxies, merge across the universe, generating gravitational waves. This breakthrough provides enough data to suggest that there is a gravitational wave background which exists in our universe.
- To discover low-frequency gravitational waves, scientists used entirely different technologies that were carried out by radio astronomers representing five different international teams, including **Indian Pulsar Timing Array (InPTA).**
- The researchers used **six large radio telescopes** around the world, including the one in Pune, to study objects called **pulsars,** distant rapidly-rotating neutron stars that emit pulses of radiation, observed from the Earth as bright flashes of light.
- These bursts take place at exact intervals, and therefore scientists use pulsars as **'cosmic clocks.**
- After examining 25 pulsars over 15 years, Scientists have proposed that the observed inconsistencies were due to deformities caused in space-time by gravitational waves. These irregularities showed consistent effects of the presence of gravitational waves.

LIGO

- **LIGO** is an international network of laboratories that detect the ripples (**gravitational waves)** in space-time produced by the movement of large celestial objects like **stars and planets**.
- These ripples were first postulated in **Albert Einstein's general theory of relativity,** which encapsulates our current understanding of how gravitation works.

- The **LIGO detectors** are sensitive to distance changes that are several orders of magnitude smaller than the **length of a proton.**
- The experiment works by releasing **light rays simultaneously** in both chambers. Usually, the light should return at the same time in both chambers.
- However, if a gravitational wave passes through, one chamber elongates while the other squishes, resulting in a **phase difference** in the returning light rays. Detecting this phase difference confirms the presence of a gravitational wave.

Space-time

- In Special Theory of Relativity, Einstein proposed that space and time don't exist as independent entities, combining the three dimensions (height, width and depth) of space and one dimension of time into a single four-dimensional continuum, known as space-time.

INS Rana & INS Sumedha undertook Maritime Partnership Exercise with French Navy ship FS Surcouf in Bay of Bengal

India-France Maritime Partnership Exercise

- INS Rana, **a guided missile destroyer** and INS Sumedha, **an indigenously built offshore patrol vessel** were from the Indian Navy side.
- The French Navy's **La Fayette class frigate Surcouf** participated in a variety of activities with Indian Navy ships.
- The Exercise included **tactical manoeuvres, replenishment at sea approaches**, air defence against fighter aircraft and cross deck helicopter operations.
- **Location**: Bay of Bengal.
- The Partnership Exercise signifies the strong navy-to-navy links, interoperability and strong bonds **between Indian Navy and French Navy.**
- **Other Exercises with France**:
  - **VARUNA:** NAVAL EXERCISE
  - **FRINJEX:** MILITARY EXERCISE
  - **GARUDA:** AIR FORCE EXERCISE

Successful Completion of Marine Engineering Specialisation Course at INS Shivaji

INS Shivaji

- It is an **Indian Naval station placed in Lonavala, Maharashtra.**
- It **homes the Naval College of Engineering which trains officers of the Indian Navy and the Indian Coast Guard.**
- Indian Navy already **operates a primary damage manipulate simulator Akshat** at INS Shivaji **to train its officers and sailors on damage manage on a warship at sea.**
- **Indian Navy's Nuclear, Biological and Chemical Defence School and Center for Marine Engineering Technology** also are also based here.
- INS Shivaji had its humble **beginning as replacement for the 'Stokers' Training School' at HMIS Dalhousie,** in Naval Dockyard, **Bombay**.
- **Commissioned with the aid of the then Governor of Bombay, Sir John Colville, as HMIS Shivaji on 15 February 1945, it has become INS Shivaji**

on 26 January 1950.

Philippine Army Explores BrahMos Missile Deal With India To Strengthen Maritime Defence

Brahmos Missile

- It is a **supersonic cruise missile.**
- It is a **joint venture between** the Defence Research and Development Organisation **(DRDO) of India and NPOM of Russia**.
- It is **named after the rivers Brahmaputra and Moskva.**
- **Features**:
    - It is a **two-stage missile** with a **solid propellant engine in the first stage** and a **liquid ramjet in the second.**
    - The system has been designed with **two variants for Anti-Ship and Land-Attack roles.**
    - Brahmos is **one of the fastest cruise missiles currently operationally** deployed with the **speed of Mach 2.8,**which is nearly **3 times more than the speed of sound.**
    - It has a **launch weight of 2,200-3,000 kg**.
    - It **operates on the "Fire and Forgets" principle**, adopting varieties of flights on its way to the target.
    - BrahMos is **equipped with stealth technology** designed to make it less visible to radar and other detection methods.
    - It has an **inertial navigation system (INS) for use against ship targets**, and an **INS/Global Positioning System for use against land targets**.

Japan-India Maritime Exercise 2023 (JIMEX 23).

JIMEX 2023

- This edition marks the 11th anniversary of JIMEX, since its **inception in 2012.**
- This exercise will witness the participation of **INS Delhi, INS Kamorta**, fleet tanker INS Shakti, a submarine, maritime patrol aircraft P8I and Dornier, ship-borne helicopters and fighter aircraft.
- The exercise will be conducted over **six days in two phases.**
- A harbour Phase at Visakhapatnam comprising professional, sports and social interactions.
- The two navies will jointly hone their war fighting skills at sea and enhance their interoperability through complex multi-discipline operations in the surface, sub-surface and air domains.
- JIMEX 23 provides an opportunity to learn from each other's best practices and facilitates operational interactions between IN and JMSDF to foster mutual cooperation and reaffirm their shared commitment towards maritime security in the region.

Other Exercises between India and Japan

- **Malabar:** India and Japan with the United States and Australia participate in the naval war gaming exercise named Malabar.
- **SHINYUU Maitri** (Air Force)
- **Dharma Guardian** (Military Exercise)

IN - US n salvage and explosive ordnance disposal exercise

EXERCISE – SALVEX

- **Indian Navy – US Navy** have been participating in joint Salvage and EOD exercises **since 2005.**
- It is the **Seventh edition of SALVEX.**
- The exercise saw participation from both the navies which included the ships – INS Nireekshak and USNS Salvor in addition to Specialist Diving and EOD teams.
- It also saw conduct of joint training exercises towards enhancing **interoperability, cohesiveness** and gaining from best practices mutually in Maritime Salvage and EOD operations.
- The constructive engagements on operational terms enhanced the skill-sets of the Diving teams in a number of diverse disciplines such as **mine detection and neutralisation, wreck location and salvage.**

Other exercises conducted between India and US

- **Malabar Exercise:** It is a quadrilateral naval exercise of India, USA, Japan and Australia
- **Exercise Tiger Triumph:** It is a humanitarian Assistance and Disaster Relief exercise.
- **Yudh Abhyas:** It is a joint military exercise

What is a 'Gravity Hole'? Can Indian Ocean's 'Gravity Hole' open doors to secrets of Earth's origin?

Gravity hole

- The gravity hole is a region of the ocean where **the effects of gravity are less than usual.**
- It occurs at the bottom of the ocean where there are **gravitational anomalies.**
- **Why it occurs?** These anomalies are caused by variations in the **gravitational pull of the Earth** due to differences in the density of the materials that make up the Earth's crust.
- The Indian Ocean is home to one of the most profound gravitational anomalies on Earth known as **the Indian Ocean Geoid Low (IOGL).**
- It was **discovered in 1948** during a ship-based gravity survey by Dutch geophysicist Felix Andries Vening Meinesz.
- It is found in a large section of over three million sq. km in the Indian Ocean seafloor, located around **1,200 km southwest of India's southern tip.**
- It is estimated to have formed **approximately 20 million years ago.**
- Researchers said that the IOGL comprises **slabs from the Tethys Ocean**, a long-lost sea that plunged into the depths of the planet millions of years ago.
- The Tethys Ocean, which once separated the supercontinents of Gondwana and Laurasia is believed to have perturbed the African Large Low Shear Velocity province

Solar shooting stars: Scientists left stunned by 'rain of fireballs' on Sun

Solar shooting stars

- These are massive **clumps of plasma** that plummet to the Sun's surface at incredible speeds.
- These looks like a massive rain of fireballs that play a **key role in heating up**

the corona which is the outermost part of the Sun's atmosphere.
- The researchers observed these solar shooting stars using the **Solar Orbiter spacecraft** of the **European Space Agency.**
- This is the first time such impacts have been spotted.
- These observations were made from a close distance of just 30 million miles from the sun.

coronal rains formed on Sun
- The Coronal rain which is plasma firework displays consisting of gas with temperatures exceeding two million degrees Fahrenheit.
- Instead of water, **coronal rains form when localised temperature drops**, causing solar plasma to condense into dense lumps.
- These lumps then fall to the cooler surface of the Sun, known as the photosphere, as fiery rain at speeds of up to 220,000 miles per hour.

Significance of this observation
- This could help solve the mystery of why the corona, the outermost part of the Sun's atmosphere, is hotter than the layers beneath it.

What are cluster bombs, US sending to Ukraine and over 100 countries have banned it

Cluster bombs
- A cluster bomb is a type of weapon that is **designed to disperse smaller bombs** over a large area.
- They are also known as cluster munitions, with the smaller bombs referred to as submunitions or bomblets.
- They can be **dropped from air or fired from ground/sea**, dispersing dozens or hundreds of bomblets across a large area.
- These explosions pose a grave threat to anyone in the vicinity, causing death or severe injuries.
- Some bomblets **fail to detonate immediately**, leaving behind unexploded ordnance that can harm or kill people for years to come
- The use of cluster bombs **has been widely condemned internationally**.
- Over 100 countries have ratified the **Convention on Cluster Munitions.**

Convention on Cluster Munitions
- It was adopted in Dublin on 30 May 2008 and opened for signature in Oslo on 3 December the same year.
- It prohibits all **use, stockpiling, production and transfer of cluster munitions**.
- Separate articles in the Convention concern destruction of stockpiles, clearance of contaminated areas, assistance to victims, submission of transparency reports, and adoption of domestic legislation.
- The Convention **became binding international law** when it entered into force on 1 August 2010.
- Till date a total of 123 States have joined the Convention – 111 States Parties and 12 Signatories.
- **India** is **not a signatory** to this convention.

Naval Group working on qualifying DRDO-developed Air Independent Propulsion system for installation on Scorpenes

The French defence firm has invested over ₹100 crore for three workshops for maintenance of critical systems of Scorpene submarines in India

Indigenous AIP module

- The Navy has drawn up plans to install Air Independent Propulsion (AIP) modules on all Scorpene submarines as they go for their refit beginning with ***INS Kalvari*** likely by end next year to enhance their endurance. The indigenous AIP module has been tested on shore and recently DRDO and Naval Group signed an agreement to integrate the AIP module on the Scorpene.
- They are actively supporting the DRDO in qualifying indigenous supplier of liquid oxygen tank and preparation of the future stage of "**Jumboisation**" [making the new hull, integrate safely the AIP, cut the submarine and join it with new AIP section] during submarine's normal refit.

ART & CULTURE

A fascinating fusion of rock art at Rudragiri hillock

Rudragiri hillock

- It is located in Guntur district of **Andhra Pradesh.**
- It is nestled amidst the **Eastern Ghats**, features five naturally formed rock shelters at its foothills, facing westward.
- These shelters served as living quarters for people during the **Mesolithic age** around 5000 B.C and they bear witness to the luminous rock paintings of that era.
- Two natural caves at the **southern end** of the hillock also exhibit exceptional murals from the renowned **Kakatiya kingdom.**
- **Key findings:**
    - The **first cave** presents a narrative mural portraying the intense battle between the **Vanara brothers, Vali and Sugriva**. Both figures stand on the battlefield wielding maces, their faces displaying fierce determination. Rama, positioned behind Sugriva, shoots arrows at Vali.
    - A **Ramayana fresco depicting Hanuman** lifting the Sanjeevani hill with his right-hand painted A conch and fire altars can be seen to his right and another prehistoric painting to the left.
    - In the **middle cave,** a grand sketch of Hanuman, accompanied by sacred symbols of the **conch (Sankha**) and the **fire altar (Yagna Vedi),** captures visitors' attention. Hanuman is depicted carrying the Sanjivani hill in his right hand, symbolising his mission to save Lakshmana's life.
    - The **third cave** houses the **prehistoric rock paintings** from the **Mesolithic** era.
    - Interestingly, the Kakatiya artist chose the same rock shelter to superimpose the elegant figure of Hanuman, who is portrayed in a unique **'Anjali' posture**, folding his hands in a divine offering.
- The illustrious **Ganapati Deva Maharaja** (1199-1262 AD), the founder of Muppavaram temple and a prominent figure of the Kakatiya dynasty, likely **patronised the rich ancient mural heritage** found at Rudragiri.

Mesolithic period

- It is also called **Middle Stone Age** which existed between the Palaeolithic (Old Stone Age) and the Neolithic (New Stone Age).
- **Timeframe:** This period is generally considered to have occurred between **approximately 12,000-10,000 years ago**
- **Lifestyle:** During the Mesolithic period, human societies were **predominantly hunter-gatherer communities.**

Handmade cloth toys recreate Assam's Bodo culture

The plastic-free cloth toys in traditional attire tell the story of the Bodo community of Assam. After all, the **dokhona** is a traditional attire of Bodo women and the **gamcha** is a handmade towel woven specifically men in Assam.

Assamse Gamocha

- Assamese Gamocha is a traditional handwoven cotton towel, which is an integral part of Assamese culture and tradition.

- It is a **rectangular piece of cloth**. The towel comes in various colors and designs, and the **most popular among them are the red and white ones with a Phulam known as the 'Gamocha design'.**
- The word 'Gamocha' is derived from the Assamese word **'Ga' (body) and 'Mocha' (wipe), which means a towel to wipe the body.** The weavers use a traditional loom called the **'Taat Xaal'** to weave the towel.
- **Recognition:**
    - The Assamese Gamocha has gained national and international recognition for its unique design and cultural significance. It was granted the **Geographical Indication (GI) tag**, which is a recognition of its origin and unique characteristics.
    - The GI tag ensures that the Gamocha is protected from imitations and helps to promote the local weavers and their traditional weaving techniques.
- **Cultural Significance:**
    - The Assamese Gamocha is a **symbol of Assamese culture and tradition.** The towel is used in various ways in daily life, and each use has a specific cultural significance.
        - It is used as a **headscarf by women during traditional ceremonies and functions**, and it is a **sign of respect and honor when it is presented to someone as a gift.**
        - The Gamocha is also used during the **Bihu festival**, which is the most important festival of Assam. It is **draped around the neck of the Bihu dancers**, and it is an essential part of their costume. The towel is also used as a symbol of unity and brotherhood during the Bihu festival.

Bengali Gamcha

- Bengali Gamcha traditional handwoven cotton towel, which is an integral part of Assamese culture and tradition. It is a **rectangular piece of cloth.** It comes in a **red-and-white chequered pattern.**

ASI to restore Safdarjung tomb dome in Delhi by July-end

Safdarjung Tomb

- Safdarjung Tomb is the **last garden tomb constructed in the late Mughal Empire Style**.
- **Location**: At the Intersection of Safdarjung Road and Aurobindo Marg, **New Delhi, India.**
- It was **built in 1753- 54 as mausoleum of Safdarjung**, the viceroy of Awadh under the Mughal Emperor, Mohammed Shah. **It was built by his son, Nawab Shujaud Daula**.
- **Architecture:**
    - Also known as **'Safdarjung ka Maqbara**,' the tomb is **built on a square plan and has a central dome** and **is made of marble and sandstone.**
    - The **dome is surrounded by four smaller domes and four minarets**.
    - The **exterior of the tomb is decorated** with intricate **latticework and calligraphy**.
    - The **interior of the tomb is decorated with marble and gold leaf**.
    - The **tomb is surrounded by lush green gardens.** The **garden is in the**

Mughal Charbagh garden style, and is a **smaller version of the garden of Humayun Tomb**.

Safdarjung

- **Safdarjung (1708 – 5 October 1754**), whose full name was Mirza Muqim Abul Mansur Khan, was a **major figure in the Mughal court during the declining years of the Mughal Empire.**
- He became the **second Nawab of Awadh** when he **succeeded Saadat Ali Khan I** (his maternal uncle and father-in-law) **in 1739.**
- **In 1739, Safdarjung was appointed the Prime Minister of the Mughal Empire** by **Emperor Muhammad Shah**.
- He **served as Prime Minister for five years**, during which time he helped to stabilize the Mughal Empire and to improve its relations with other powers in the region.
- **After his term as Prime Minister, Safdarjung returned to Awadh**, where he **ruled as Nawab for the next 15 years.**
- He was a **capable ruler, and he helped to make Awadh one of the most prosperous provinces in the Mughal Empire.**
- He **built many mosques, madrasas, and other public buildings in Awadh**, and he also supported the arts of music, poetry, and painting.
- **He died in 1754**, and he was buried in Safdarjung Tomb, Delhi.

Bengal tribal politics heats up after Ol Chiki figures in PM 'Mann Ki Baat'

Ol Chiki script

- It was created in 1925 by **Raghunath Murmu** (1905-1982), writer and teacher from what is Mayurbhanj State (now part of Odisha) in India as a way to write Santhali a Munda language.
- Ol Chiki is also known as **Ol Cemet', Ol Ciki, Ol** or the Santhali alphabet.
- It was created as a way to promote Santhali culture.
- The script was first publicized in 1939 at the Mayurbhanj State exhibition.
- Murmu published over 150 books in Santhali in the Ol Chiki script, including novels, poetry, drama, grammars, dictionaries and other information about the language and script.
- Santhali is also written with the Latin, Odia, Bengali and Devanagari alphabets.
- Santhali language is spoken mainly in Jharkhand and West Bengal states in northern India, and also in northwestern Bangladesh, eastern Nepal and Bhutan.

Hul Diwas

- The Santhal rebellion or 'Hul' – literally, revolution – began in 1855 two years before the uprising of 1857.
- It was an "organised war against colonialism" led by the Santals, standing against the myriad forms of economic oppression
- It was led by two brothers Sidhu and Kanhu.
- It saw the participation of as many as 32 caste and communities rallying behind them.

Statues depicting life of indigenous Todas, native wildlife lend colour to Udhagamandalam town

The statues are being put up as part of a beautification project, under 'Ooty 200', to mark the bicentenary of the first colonial expedition to the Nilgiris
The life of the indigenous Toda community as well as their culture, including the stone-lifting competition that is held in the toda '**munds**' (villages). The beautification work is part of a number of projects being undertaken by the Nilgiris district administration as part of the 'Ooty 200' celebrations, to mark the bicentenary of the first colonial expedition to the Nilgiris, led by British administrator, **John Sullivan**.
As part of the project, statues of Nilgiris' wildlife, including elephants and deer have also been installed near HPF. Similar exhibits, with Indian gaur also feature in garden squares and traffic islands in the town. Artists from Coimbatore were also brought to the Nilgiris to paint murals along walls and revetments on various buildings and along the sides of the road within the town.

- Toda Tribe is a **pastoral tribe** of the **Nilgiri Hills** of **southern India.**
- The Toda language is **Dravidian** but is the **most unusual and different** among the languages belonging to the Dravidian family.
- They **live in settlements** of from three to seven small **thatched houses.**
- They **traditionally trade dairy products,** as well as **cane and bamboo articles,** with the other Nilgiri peoples.

Toda Embroidery

- In the Toda language it is called ***pohor.***
- The traditional Toda dress is a **distinctive shawl** which is called ***putukuli.***
    - Considered a **grand garment,** it is only **worn for special occasions** like visits to the temple, festivals and finally as a shroud.
- The embroidery is **done by Toda women** and has **distinctive red and black** (and **occasionally blue) thread work in geometric designs** on **unbleached white cotton fabric.**
- It has got a **Geographical Indications (GI) Tag.**

Odisha Recommends Inclusion Of 'Kui' Language In 8th Schedule

- Kui (also known as Kandh, Khondi, Khond, Khondo), is a **South-Eastern Dravidian language spoken by the Kandha community.**
- It is **primarily spoken in the state of Odisha.**
- It is **closely related to other languages in the Dravidian family, such as Gondi and Kuvi**. It was **also referred to as the Kuinga language** during the historical period.
- With 941,988 registered native speakers, it figures at **rank 29 in the 1991 Indian census**.
- **Script**: Kui is **traditionally written using the Odia script**, which is also used for writing the Odia language.

8th Schedule of the Indian Constitution:

- It l**ists the official languages of India.**
- Although there are hundreds of languages spoken across the country, the eighth schedule **recognises a total of 22 languages as the official languages.**
- **Languages in 8th Schedule:**
    - The 22 languages now included in the eighth section of the Constitution are, **Manipuri, Maithili, Kashmiri, Hindi, Kannada,**

Gujarati, Konkani, Malayalam, Assamese, Marathi, Nepali, Bengali, Punjabi, Sanskrit, Sindhi, Telugu, Tamil, Odia, Urdu, Bodo, Dogri, and Santhali.

- **Fourteen** of these languages **were originally listed in the Constitution**. **Sindhi** was introduced **in 1967, Konkani, Manipuri, and Nepali in 1992**, and **Santali, Dogri, Maithili, and Bodo by the 92nd Amendment Act of 2003.**

At G20 meet, a Guinness effort to shine light on Karnataka's Lambani craft

- Over 450 women artisans and cultural practitioners from Lambani community inhabiting Karnataka came together to create embroidered patches with Sandur Lambani embroidery, creating 1,755 patchwork pieces.

Lambani embroidery patches

- The Lambani embroidery is **an intricate form of textile embellishment** characterised by colourful threads, mirror-work and stitch patterns.
- It is practised in **several villages of Karnataka** such as Sandur, Keri Tanda, Mariyammanahalli, Kadirampur etc.
- The Lambani craft tradition involves stitching together small pieces of discarded fabric to create a beautiful fabric.
- This embroidery had also found a place in the list of **products with Geographic Indication (GI) tag in the country.**

Lambani People

- The Lambanis are also known as Banjaras and most of them are found in **Telangana, Andhra Pradesh and Karnataka states in South India.**
- This community settled across the country with different names, have permanently abandoned their nomadic lifestyle and settled in their **settlements called Tandas.**
- **They speak Gor Boli** also called Lambadi which belongs to the Indo-Aryan Group of Languages. Lambadi has no script.
- They celebrate the **festival of Teej during Shravanam** (in the month of august). In this festival young unmarried Banjara girls pray for a good groom.
- **Fire dance and Chari** are the traditional dance forms of the banjara people.

FACTS FOR PRELIMS

India to resume operations at stalled hydrocarbon block in Iraq, which has been under force majeure since 2003.

Force Majeure

- Force majeure is a French term that **literally means "greater force."**
- The concept of force majeure **refers to an extraordinary event rendering the legal obligations** between two or more contractually bound parties **impossible to fulfil.**
- It is **related to the concept of an act of God**, **an event for which no party can be held accountable. This type of event must be entirely beyond the parties' reasonable control.**
- As a precautionary measure against breach of contract, **many commercial agreements contain force majeure contract clauses enumerating a list of major events** that could **result in non-performance of contractual duties**.
- Notable events **include war, riots, criminal activity, epidemics, pandemics**, and other unforeseeable events.
- For force majeure to apply, these hindering circumstances **must be beyond a party's reasonable control.**
- The **contracting parties must** also **prove their reasonable efforts to mitigate the circumstances that have rendered the fulfilment of their duties impracticable**.
- Such events may **result in the parties delaying their obligations** for a period of time, **revising the contract terms**, **or agreeing on the contract's cancellation**.
- While force majeure has **neither been defined nor specifically dealt with**, **in Indian statutes**, some reference can be found in **Section 32 of the Indian Contract Act, 1872 (the "Contract Act") envisage**s **that if a contract is contingent on the happening of an event** which event becomes impossible, **then the contract becomes void.**
- Force majeure **conflicts with the concept of "pacta sunt servanda**," a principle in international law **that agreements must be kept and not wriggled out of.**

DGFT implements the Advance Authorisation Scheme, allows duty-free import of inputs for export purposes

Advance Authorisation Scheme

- It allows **duty free import of inputs**, which are physically incorporated in an export product. In addition to any inputs, packaging material, fuel, oil, catalyst which is consumed / utilized in the process of production of export product, is also be allowed.
- They are **not allowed to sell** the products **in the domestic market.**
- The Advance Authorization is **valid for 12 months** from the date of issue of such Authorization.
- **Eligibility:**
    - This scheme is available to **either a manufacturer exporter directly** or a merchant exporter tied with a supporting manufacturer.
    - It includes physical exports, intermediate supply, supplies made to

specified categories of deemed exports.

- **Duties exempt:** The inputs imported are exempt from duties like Basic Customs Duty, Additional Customs Duty, Education Cess, Anti-dumping duty, Safeguard Duty and Transition Product-Specific Safeguard duty, Integrated tax, and Compensation Cess, wherever applicable, subject to certain conditions.

Universal Postal Union to evaluate UPI platform for cross-border remittances

Universal Postal Union (UPU)

- It is a **United Nations specialized agency** and the **postal sector's primary forum for international cooperation.**
- It was established by the **Treaty of Bern of 1874.**
- UPU is the **second oldest international organization** worldwide**.**
- **Mandate**: To **ensure universal access to postal services.**
- **Headquarters: Bern, Switzerland**
- **Functions:**
    - It **coordinates postal policies among member nations** in addition to the **worldwide postal system.**
    - It **sets the rules for international mail exchanges** and makes **recommendations to stimulate growth in mail, parcel and financial services** volumes and improve the quality of service for customers.
    - It helps to **ensure a truly universal network** of up-to-date products and services.
    - It fulfils an **advisory, mediating and liaison role** and **provides technical assistance** where needed.
- **Member countries:**
    - **Any member country of the United Nations may become a member** of the UPU.
    - **Any non-member country** of the United Nations **may become a UPU member,** provided that **its request is approved by at least two-thirds of the member countries of the UPU.**
    - The UPU **now has 192 member countries.**
- **Structure**: UPU consists of **four bodies,**
    - **The Congress:** It is the **supreme authority** of the UPU and **meets every four years.**
    - **The Council of Administration:** It e**nsures the continuity of the UPU's work between Congresses**, **supervises its activities** and studies regulatory, administrative, legislative and legal issues.
    - **The Postal Operations Council:** It is the **technical and operational mind** of the UPU and **consists of 48 member** countries elected during Congress.
    - **The International Bureau: Fulfilling a secretariat function**, the International Bureau **provides logistical and technical support** to the UPU's bodies.

Bharat Bill Pay's business grew threefold in just 2 years: CEO Nupur Chaturvedi

Bharat Bill Payment System (BBPS)

- BBPS is an **integrated bill payment system** or a platform which acts as a

connect between various billers and users.

- It is a **one-stop ecosystem for payment of all bills** providing an interoperable and accessible **"Anytime Anywhere" Bill payment service to all customers across India** with certainty, reliability and safety of transactions.
- It offers customers the **convenience of payment by cataloguing various utility providers under one platform.**
- It acts as a **central reference for a customer who wants to make different payments** — whether utility bills, loan repayments, FasTag recharge, and so on.
- **Different Payment Channels:**
    - Bharat BillPay transactions can be **initiated through multiple payment channels like Internet, Internet Banking, Mobile**, Mobile-Banking, Mobile Wallets Bank Branch, Agents and Business Correspondents etc.
    - It provides **instant confirmation of payment via an SMS or receipt.**
- **Who are the stakeholders?**
    - BBPS was **conceptualised by the Reserve Bank of India in 2013** and is a **product of the National Payments Council of India (NPCI).**
    - It was **piloted in 2016** and **went live a year later.**
    - **By 2019, BBPS onboarded all recurring payments**.
- **Components**: There are **two key components** in the BBPS system,
    - **Bharat Bill Payment Central Unit (BBPCU):** The **BBPCU is NPCI**, which **lays downs the operating procedures and standards for BBPS.**
    - **Bharat Bill Payment Operating Units (BBPOUs):** BBPOUs **adhere to the rules set by BBPCU**. They **are the banking and non-banking entities** that handle the payments load.
    - **Then, there are billers (utility providers) and agents**, either as institutions or individuals, who provide services primarily on the collection side, to BBPOUs.

Henley Passport Index: India moves up 7 ranks to 80th place, Singapore replaces Japan as most powerful passport

Henley Passport Index 2023

- The Henley Passport Index is the original, authoritative **ranking of all the world's passports according to the number of destinations their holders can access without a prior visa.**
- It is **published by Henley & Partners**, a global citizenship and residence advisory firm, in **partnership with the International Air Transport Association (IATA).**
- The index **includes 199 different passports and 227 different travel destinations**.
- The index is based on exclusive **data from the International Air Transport Association (IATA)** and enhanced by Henley & Partners' research team.
- **Highlights of Henley Passport Index 2023:**
    - **Singapore has topped** the passport rankings with **visa-free access to 192 global destinations.**

- With visa-free access to 190 destinations, three European countries – **Germany, Italy and Spain – share the second rank on the list.**
- **Japan, the previous top-rank holder, slipped down to the third rank**. Japan shares the rank with Austria, Finland, France, Luxembourg, South Korea and Sweden.
- **With 101, 102 and 103 ranks respectively, Syria, Iraq and Afghanistan are the world's weakest passports**. **Pakistan is on the 100th spot**.

- **India's rank:**
  - India has **climbed seven places to 80th rank** from 87 last year.
  - It **shares the spot with Senegal and Togo**, with **visa-free access to 57 destinations.**

First ever "Credit Guarantee Scheme" for Livestock Sector

Credit Guarantee Scheme

- It aims to **strengthen the credit delivery system** and ensure smooth access to finance for **entrepreneurs engaged in the Livestock sector.**
- *Objective*.
  - The main objective is to encourage lenders to focus **on the viability of projects and provide credit facilities** based on the primary security of the assets being financed.
  - By providing access to financial assistance, it promotes investments in various areas of the livestock sector, such as dairy and meat processing, animal feed plants, breed improvement technology, waste management, and veterinary vaccine and drug manufacturing facilities.
- *Funding*
  - The DAHD has set up a **credit guarantee fund trust of Rs 750 crore**, which will **cover up to 25 per cent of credit facilities** extended to eligible MSMEs by lending institutions.
  - The trust, formed in partnership with **NAB Sanrakshan Trustee Company** Private Ltd, a subsidiary of NABARD, **ensures credit guarantee for MSMEs** under the AHIDF scheme.
- *Key features include:*
  - Interest **subvention of three per cent**
  - Loan of up to 90 per cent of the total project cost from any Scheduled Bank, National Cooperative Development Corporation (NCDC).
- **Who is eligible for the scheme?** The scheme targets underserved sections of society, including **first-generation entrepreneurs** and **underprivileged individuals**, who often lack collateral security for their ventures.

In single-day record, Ranjit Sagar Dam generates 153.97 lakh units

Ranjit Sagar Dam (RSD)

- The Ranjit Sagar Dam, **also known as the Thein Dam**, is a major **water reservoir and hydroelectric power projec**t located **on the Ravi River in the state of Punjab**.
- It is located about **24 kilometres (15 miles) from the international border with Pakistan**.

- The dam was constructed to harness the waters of the Ravi River and was **completed in 2000.**
- It is a **concrete gravity dam with a height of about 162 meters** (531 feet) and **a length of approximately 518 meters** (1,699 feet).
- The dam **creates a vast reservoir known as the Ranjit Sagar Lake or Thein Lake**. The reservoir has a **storage capacity of around 0.97 billion cubic meters** (789,000 acre-feet) and helps regulate water flow for various purposes.
- It has an **installed capacity of 600 megawatts (MW).**

Ravi River

- **Origin**: It originates in the western Himalayas in the Multhan tehsil of **Kangra district of Himachal Pradesh.**
- It then **flows through the Indian state of Punjab and enters Pakistan**, where it eventually **joins the Chenab River in the province of Punjab**.
- **Length**: **The total length** of the Ravi River is approximately **720 kilometres** (447 miles). **Around 158 kilometres** (98 miles) of the river's course **lie in India**, and the remaining 562 kilometres (349 miles) flow through Pakistan.
- **Tributaries**: The Ravi River is fed by several tributaries, including the **Bhadal, the Ujh, the Tarnah, and the Basantar rivers in India,** and the Aik, the Bara, and the Beas rivers in Pakistan.

Spectacular waterspout in Russia goes viral on the internet

- A waterspout is a **tornado-like column or funnel of violently rotating air** that usually **forms over the surface of the sea.**
- It is **a non-supercell tornado over water having a five-part life cycle,**
  - **formation of a dark spot on the water surface**;
  - **spiral pattern** on the water surface;
  - **formation of a spray ring**;
  - **development of the visible condensation funnel**;
  - and ultimately, **decay**;
- Waterspouts **form mostly in tropical and subtropical areas**. But regions, including Europe, Middle-East, Australia, New Zealand and Antarctica also report these on rare occasions.
- They may **assume many shapes** and **often occur in a series, called a waterspout family.**
- **Key characteristics of waterspouts include**:
  - **Funnel cloud:** Waterspouts **have a visible funnel-shaped cloud** that **extends downward from a parent cloud** or the base of the thunderstorm.
  - **Water connection:** Waterspouts have a **visible connection to the water's surface**, **drawing water or spray upward into the vortex**.
  - **Duration:** Waterspouts **can be relatively short-lived**, ranging from a few minutes to an hour or so.
  - **Size**: Waterspouts are **typically much smaller in scale compared to tornadoes**, with diameters ranging from tens to a few hundred meters.
- They are classified into **two main types**: **tornadic waterspouts** and **fair-weather waterspouts.**
- **Tornadic waterspouts:**

  - They are **tornadoes that form over water**, **or move from land to water**.
  - They have the **same characteristics as a land tornado**.
  - They are **associated with severe thunderstorms**, and are often **accompanied by high winds and seas**, large hail, and frequent **dangerous lightning**.
- **Fair weather waterspouts**:
- They **usually form along the dark flat base of a line of developing cumulus clouds**.
- This type of waterspout is generally **not associated with thunderstorms.**
- While **tornadic waterspouts develop downward in a thunderstorm**, a **fair-weather waterspout develops on the surface of the water and works its way upward.**
- By the time the funnel is visible, a fair-weather waterspout is near maturity.
- Fair weather waterspouts **form in light wind conditions so they normally move very little.**

Tornado

- A tornado is a **narrow, violently rotating column of air that extends from a thunderstorm to the ground.**
- Because wind is invisible, **it is hard to see a tornado unless it forms a condensation funnel made up of water droplets, dust and debris.**

Logistics Data Bank Project Meeting held to review measures

Logistics Data Bank Project

- This project was launched on 2016 at the Jawaharlal Nehru Port, Mumbai.
- **Objectives:** The project launched to make India's logistics sector more efficient through the use of Information Technology.
- **Implementing Agency:** It is being implemented through a Special Purpose Vehicle called **Delhi Mumbai Industrial Corridor Development Corporation Logistics Data Services Ltd.** (DLDSL) - that is jointly (50:50) owned by the Delhi Mumbai Industrial Corridor (DMIC) Trust and Japanese IT services major NEC Corporation.
- **Key features:**
  - Every **container is attached to** a **Radio Frequency Identification Tag** (RFID) tag and then tracked through RFID readers - aids **importers and exporters in tracking their goods in transit.**
  - This has, in turn, cut the overall lead time of container movement as well as reduced transaction costs that consignees and shippers incur.
  - The project covers "the entire movement (of containers) through rail or road till the Inland Container Depot and Container Freight Station.
  - The service **integrates information available** with the agencies across the supply chain to provide detailed, real-time information within a single window.
- It is billed as a major 'ease of doing business' initiative aimed at boosting India's foreign trade and ensuring greater transparency.
- **Nodal Ministry:** Ministry of Commerce and Industry.

Airbus pitches A-400M transport aircraft for IAF's Medium Transport Aircraft

contest

Airbus A400M

- It is a **European-built military transport aircraft**.
- The aircraft is **manufactured by Airbus Defence and Space**, a division of the European aerospace and defence firm Airbus.
- It combines the capability to **carry strategic loads with the ability to deliver even into tactical locations** with small and **unprepared airstrips**.
- It can **carry large cargo, vehicles, troops, and paratroopers** or be configured for **medical evacuation (MEDEVAC) missions**.
- **Features**:
    - A powerful **turboprop engine** that gives the A400M the **ability to operate from short, unimproved airfields.**
    - **Maximum takeoff weight: 141 metric tons** (309,000 pounds)
    - **Maximum payload: 37 metric tons** (41 short tons).
    - It can **carry up to 116 fully equipped troops** or 66 **stretchers and 25 medical attendants. T**he cargo hold can take **nine standard military pallets**.
    - **Range: 8,900 kilometres** (5,530 miles)
    - **Speed: 780 kilometres per hour** (485 miles per hour)
    - The aircraft is equipped with **in-flight refuelling capabilities**.
    - The aircraft's independent navigation system comprises an **inertial reference system (IRS) integrated with a global positioning system (GPS).**
    - It features **an advanced glass cockpit with modern avionics** and control systems.

Turboprop aircraft

- A turboprop aircraft uses a **turbo-prop engine rather than a piston-powered engine** or a jet engine.
- They **have one or more gas-turbine engines connected to a gearbox that turns the propeller(s) to move the aircraft on the ground and through the air.**
- Turboprop aircraft **have lower operating costs** than jets because **they burn less fuel**, but they are **also slower than jets.**

World's biggest permafrost crater in Russia's Far East thaws as planet warms

Batagaika Crater

- It is located in **Russia's Far East** that forms the world's biggest **permafrost crater.**
- Scientists believe that the crater is the result of a melting permafrost land, which was frozen during the Quaternary Ice Age 2.58 million years ago,
- It began to form after the surrounding forest was cleared in the 1960s and the permafrost underground began to melt, causing the land to sink.
- It is also called as "**gateway to the underworld**," by some locals in Russia's Sakha Republic It has a scientific name: a mega-slump.
- This is produced by higher air temperatures, warming climate and anthropogenic impact.
- It holds clues to prehistoric life on Earth. Researchers believe the exposed ice and soil along the crater's edges could hold **up to 200,000 years of**

geological and biological history.

- **Impact on Environment**
  - The soil beneath the slump, which is about 100 metres deep (328 feet) in some areas, contains an "enormous quantity" of organic carbon that will release into the atmosphere as the permafrost thaws, further fuelling the planet's warming.

Invasive weed threatens elephant habitats in Tamil Nadu

Ludwigia Peruviana

- It is popularly called primrose willow, Ludwigia Peruviana, is a **native of Central and South America.**
- Its flower is **pale yellowish in colour** and the plant grows to a height of about 12 feet.
- It is an aquatic plant, which is now challenging the existence of local vegetation in various swampy areas around the world.
- The rapid large-scale spread of the weed — which was **probably introduced as an ornamental plant for its tiny yellow flowers**
- It **grows faster in wetlands** than other harmful weeds.
- The pre-monsoon temperature and monsoon rains help this weed grow faster.
- It has shaken the **balance of these perennial foraging grounds**, limiting the growth of grass and native plants that are palatable to elephants and other animals including gaur.
- It is among **the 22 priority invasive plants in Tamil Nadu.**
- Unlike other invasive plants, Ludwigia poses a unique challenge as **it grows in swamps** and there is little scope to use machinery which may further destroy the ecosystem.
- Even if Ludwigia is pulled out manually, the soft plant easily breaks and it spreads again from the root or broken stems that fall in the swamp.

Tiger orchids, largest orchid species, bloom at Kerala's Jawaharlal Nehru botanic garden

Tiger orchid

- It is **the largest orchid species** in the world.
- It is called Tiger Orchid because of its splendid flowers which sport striking brown spots against a yellow backdrop, bringing to mind tigers.
- After 8-12 years of growth, Grammatophyllum speciosum produces **flowers in alternate years in its natural habitat.**
- It is often grown as an ornamental orchid in gardens and parks for its attractive foliage and large flowers.
- It **flowers in January or July**, but plants do not flower every year.
- The plant was **listed by the Guinness Book of World Records** as the world's tallest orchid, with specimens recorded up to 7.62 metres in height
- **Distribution:** Malaysia, Indonesia, Thailand, Myanmar and Laos.
- **Habitat:** They grow **in Terrestrial** (Primary Rainforest, Freshwater Swamp Forest, Riverine) habitats.
- **Preferred Climate Zone:** Tropical, Sub-Tropical / Monsoonal.
- **Conservation status**
  - **CITES :** Appendix II

NITI Aayog launches ICED 3.0 - Power Line Magazine

India Climate Energy Dashboard (ICED) 3.0

- It is the country's **one-stop platform for near real-time data on the energy sector**, **climate**, and related economic datasets **based on government published sources**.
- It was **developed by NITI Aayog in collaboration with the** energy and climate think-tank **Vasudha Foundation.**
- **Features:**
    - Developed as a user-friendly platform, ICED 3.0 **enables users to freely access and analyses datasets using an analytical engine.**
    - It will **facilitate insights and enhance understanding about** the energy and **climate sectors while identifying the key challenges**.
    - The Portal will **draw insights from the available data parameters** and hence immensely **useful in monitoring the progress of India's clean energy transition** journey.
    - This dashboard **offers more than 500 parameters**, **over 2000 infographics**, and a **number of interactive visualizations**, allowing users to gain a holistic understanding of India's energy sector.
    - Besides energy and climate, the **dashboard also offers information on economy and demography for comparative study** and its combined analysis **along with the energy and climate issues.**

Scientists unveil method to power devices using air humidity!

Hygroelectricity

- Hygroelectricity is the **generation of electricity from the humidity of the air.**
- It is **a type of renewable energy** that has the potential to be a major source of power in the future.
- **How it works?**
    - The key to harvesting electricity from humid air lies in a **tiny device comprising two electrodes and a thin layer of material filled with nanopores**.
    - **These nanopores**, each less than 100 nanometres in diameter, **allow water molecules from the air to pass through the device.**
    - **As these molecules move from an upper chamber to a lower chamber, they interact with the edges of the nanopores**, **leading to a buildup of electric charge imbalances** between the chambers.
    - This process **effectively transforms the device into a miniature battery**, generating continuous electricity.
- **Just as clouds create electrical charges and give rise to lightning** bolts during storms, this revolutionary **device converts air humidity into usable electricity.**
- **Advantage of Hygroelectricity**: Unlike other renewable energy sources such as solar and wind, **air humidity is continuously available, making it a sustainable reservoir of energy**.
- **Challenges:**
    - Currently, the fingernail-sized device **can only produce electricity equivalent to a fraction of a volt.**

- **Scaling up the technology** to meet practical energy demands **is a significant hurdle.**

Electrode

- An electrode is a **solid conductor that conducts electricity to and from an electrolyte,** which is an electrically conductive solution or molten salt.
- Electrodes are **used in** many different applications, including **batteries, electrochemical cells, and electroplating.**
- There are two **main types of electrodes: anode and cathode.**
- The **anode is the electrode where oxidation occurs**, and the **cathode is the electrode where reduction occurs**. **Oxidation is the loss of electrons**, and **reduction is the gain of electrons.**
- In a battery, the **anode is the negative terminal**, and the **cathode is the positive terminal.**
- When the battery is connected to a circuit, **electrons flow from the anode to the cathode**. This flow of electrons **creates an electric current**.

Nanopores

- Nanopores are **tiny holes that are typically on the order of a few nanometres** in diameter.
- They can be **found in a variety of materials,** including biological cells, synthetic membranes, and even graphene.

Government introduces National Dental Commission Bill in Lok Sabha

National Dental Commission Bill, 2023

- The Bill seeks to **repeal the Dentists Act, of 1948**.
- The bill also **aims to make dental education affordable** and **make quality oral healthcare accessible.**
- It seeks to **replace the Dental Council of India with the National Dental Commission** (NDC).
- **National Dental Commission (NDC):**
  - It will **draft policies and maintain quality standards in dental education and** the **profession.**
  - The new commission will also **regulate fees for 50% seats in private dental colleges.**
  - **Composition**:
    - The composition of the NDC will be **similar to that of the National Medical Commission (NMC)**, which had replaced the Medical Council of India.
    - **The head office** of the National Dental Commission shall be **at New Delhi** and it will **consist of a chairperson; eight ex officio members; and 24 part-time members**.
    - They will be **appointed by the central government**.
    - **Members of NMC, health ministry, AIIMS**, New Delhi will be **among the** eight **ex-officio members.**
    - **Out of 24 part-time members, a total of 19** members will be appointed on rotational basis **from amongst the nominees of the states and union territories for two years.**
    - **Other five members** who will be appointed for four years will **include two dental faculties** from any central or state or

autonomous government institutes; **three members who have special knowledge** and professional experience **in areas including management, law, medical ethics,** health research, consumer or patient rights advocacy, science and technology and economics.
    - According to Bill, the **commission's members will declare their assets and liabilities at the time of entering and demitting office** and also declare all professional and commercial engagements.
- **Dental Advisory Council:**
    - Under the provisions of the bill, the **central government will constitute an advisory body** – the **Dental Advisory Council**.
    - The council will **advise the commission and will also be the platform through which states and UTs will put forth their views**.
    - **It will also advise the Commission** on measures to "en**hance equitable access to dental education** and uniform system of examination."
- The Bill will make **provision for an exit test for dentists on the lines of the National Exit Test** that is likely to be implemented **for those completing MBBS.**

Drought-hit Panama Canal restricts daily crossings in water-saving move

Panama Canal

- It is a **constructed waterway** that **connects the Atlantic and Pacific oceans across the Isthmus of Panama.**
- It is one of the two most strategic artificial waterways in the world, the other being the Suez Canal.
- It is **approximately 80 kilometres long.**
- The canal was **built by the United States** between 1904 and 1914, and it was **officially opened on August 15, 1914.**
- It is **owned and administered by the Republic of Panama** since the **oversight of the Canal was transferred from the United States to Panama in 1999.**
- The Panama Canal **consists of a series of locks that raise and lower the water level** to facilitate the passage of ships through the continental divide.

Isthmus

- An isthmus is a **narrow strip of land connecting two larger land masses which is bounded by water on two sides.**
- The word has its origins from the **Greek word isthmós which means "neck."**
- **Two notable isthmuses are the Isthmus of Panama which separates the continents of North America and South America and the Isthmus of Suez which divides Africa from Asia.**

KRS breaches 100-ft mark, thanks to copious rain in Kodagu

Krishnaraja Sagar (KRS) Dam

- It is a type of **gravity dam.**
- **Location**: It is located below the c**onfluence of river Kaveri with its**

tributaries, Hemavati and Lakshmana Tirtha, in the district of **Mandya in Karnataka.**

- **Usage**:
  - The water from the Dam is used for **irrigation in Mysore and Mandya** and is the main source of **drinking water for Mysore, Mandya and Bengaluru city.**
  - It also ensures **power supply to the Shivanasamudra hydroelectric power station**.
  - The **water released** from this dam **flows into the state of Tamil Nadu** and is **stored in the Mettur dam** in the Salem district.
- **History**:
  - The dam was **constructed during the rule of** the Maharaja of Mysore, **Krishnaraja Wadiyar IV, and it was named in his honour**.
  - **The construction** of the KRS Dam **began in 1911** and it was **completed in 1931.**
  - The dam was **designed by Sir M. Visvesvaraya**, a famous Indian engineer.
- **Features:**
  - It was **built using a mixture of surki mortar and limestone**.
  - It is **2,621 meters (8,600 ft) long** and **40 meters (130 ft) high.**
  - It **has arch type 177 Iron sluices,** and **some of them have automatic doors**.
  - Its **reservoir is about 130 Sq. Kms**, which was the largest in Asia at the period when it was built.
  - **Brindavan Gardens**, an ornamental garden, is **attached to the dam.**

Kaveri river

- Kaveri, also spelt Cauvery, is a **sacred river of southern India**. **It is known as the Ganga of South India.**
- **Origin**: It rises on **Brahmagiri Hill of the Western Ghats** in southwestern **Karnataka state**.
- It **flows in a southeasterly direction** for 765 km through the states of Karnataka and Tamil Nadu and **descends the Eastern Ghats in a series of great falls.**
- **The Cauvery basin** extends over the **states of Tamil Nadu, Karnataka, Kerala and the Union Territory of Puducherry.**
- The **river drains into the Bay of Bengal** at Poompuhar in the Mayiladuthurai district of Tamil Nadu.
- **Major left bank tributaries**: **Harangi, the Hemavati, the Shimsha and the Arkavati**.
- **Major right bank tributaries**: **Lakshmantirtha, the Kabbani, the Suvarnavati**, the Bhavani, the Noyil and the Amaravati

One in three PM-JAY hospitals inactive since scheme's launch

- Out of 27,000 hospitals empanelled for Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (PM-JAY) since its 2018 launch, only 18,783 remain active, the latest health ministry data showed.

Pradhan Mantri Jan Arogya Yojana

- It is the world's **largest health insurance/ assurance scheme** fully financed

by the government.
- The **households included** are based on the deprivation and occupational criteria of **Socio-Economic Caste Census 2011 (SECC 2011)** for rural and urban areas respectively.
- It provides a **cover of Rs. 5 lakhs per family per year** for secondary and tertiary care hospitalization across public and private empanelled hospitals in India.
- It provides **cashless access to health care services** for the beneficiary at the point of service, that is, the hospital.
- There is **no restriction on the family** size, age or gender.
- Benefits of the scheme are portable across the country i.e.; a beneficiary can visit any empanelled public or private hospital in India to avail cashless treatment.
- The scheme being implemented **by the National Health Authority.**

Byculla railway station gets UNESCO's Asia Pacific Cultural Heritage award

UNESCO's Asia Pacific Cultural Heritage award

- The UNESCO Asia-Pacific Awards for Cultural Heritage Conservation is supported by a partnership between **UNESCO and Ng Teng Fong Charitable Foundation since 2021.**
- UNESCO introduced the new category, 'Special Recognition for Sustainable Development', in 2020, together with an updated set of Awards Criteria.
- It is to acknowledge the role and contribution of cultural heritage to sustainable development within the broader framework of the UN 2030 Agenda.
- Since 2000, UNESCO Asia-Pacific Awards for Cultural Heritage Conservation have been recognizing **the achievement of the private sector and public-private initiatives** in successfully **conserving or restoring structures, places** and properties of **heritage value** in the region.

Byculla Railway station

- It was originally built in 1853.
- The first train of the country passed through Byculla station almost one-and-a-half centuries ago.
- It has been restored to its original **Gothic, heritage, architectural glory.**

MoD proposes excision of 58 cantonment boards, including SCB

Cantonment Board

- It is an organization established to **administer and manage the civilian population living in cantonment areas.**
- It operates in accordance with the **provisions of the Cantonment Act of 2006** and falls under the jurisdiction of the Union Defence Ministry.
- The boards comprise **elected representatives** as well as ex-officio and nominated members as per the Cantonments Act, 2006.
- **Composition of the board**
    - A cantonment board **consists of eight elected members**, three nominated military members, three ex-officio members (station commander, garrison engineer and senior executive medical officer), and one representative of the district magistrate.

    - The station commander of the cantonment is the ex-officio president of the board and an officer of the Indian Defence Estates Service (IDES) or Defence Estates Organisation is the chief executive officer and member-secretary of the board.
    - The boards have a term of five years.
- The boards are **classified into four categories** depending on their size and population.
    - Category I cantonments are those with populations above 50,000;
    - Category II between 10,000 and 50,000;
    - Category III between 2,500 and 10,000,
    - Category IV with populations below 2,500.
- There are a **total 66 cantonment boards** are present in India.
- A cantonment differs from a military station—the latter is exclusively devoted to the use and accommodation of military personnel and is established under an executive order.
- The cantonment, on the other hand, is an area that comprises both military and civilian populations.

Will the Gulf Stream really collapse by 2025?

- The Gulf Stream is a **swift and warm ocean current** that flows **along the eastern coast of North America and crosses the Atlantic Ocean towards Europe**.
- **Key characteristics:**
    - **Location**: It **originates in the Gulf of Mexico** and is primarily **formed by** the **convergence of warm waters from the Caribbean Sea and the Gulf of Mexico**. It then **travels northward** along the eastern coast of the United States.
    - **Direction**: It follows a **north-eastward path across the western North Atlantic Ocean.**
    - **Warmth**: The current **carries warm water from the tropics** (around 25 to 28°C or 77 to 82°F) **to higher latitudes.**
    - **Width and Speed**: The Gulf Stream is **several hundred kilometres wide** and can flow at an **average speed of about 2.5 meters per second**. However, its speed can vary depending on the location and other factors.
    - **Depth**: The current is **also very deep**, **extending to depths of up to 1,000 meters**.
- **Importance and Impact:**
    - **Climate Regulation**: It **moderates the temperatures along the eastern coast of North America**, **keeping the coastal areas warmer in winter and cooler in summer** compared to inland regions at the same latitudes. Since the Gulf Stream also extends toward Europe, **it warms Western European countries as well.**
    - **Weather Patterns**: The **warm and moist air above the Gulf Stream can lead to the formation of low-pressure systems**, which may d**evelop into storms or hurricanes**. It can also **contribute to the formation of fog** in certain areas.
    - **Maritime Navigation:** The Gulf Stream has been a crucial factor in

maritime navigation for centuries. It provides a f**ast and efficient route for ships travelling between North America and Europ**e, as it **aids in faster travel times due to its speed.**
    - **Ocean Circulation:** The Gulf Stream **is an essential part of** the larger oceanic circulation system known as the **Atlantic Meridional Overturning Circulation (AMOC).** The **AMOC plays a vital role in redistributing heat** around the Earth **and regulating global climate patterns**.

Atlantic Meridional Overturning Circulation (AMOC)

- It is a **large system of ocean currents operating In the Atlantic**, which **circulates the waters between the north and the south.**
- It is characterized by a **northward flow of warm, salty water in the upper layers** of the Atlantic, and a **southward flow of colder, deep waters** that are **part of the thermohaline circulation.**
- **How it operates:**
    - As **warm water flows northwards** in the Atlantic**, it cools, while evaporation increases its salt content.**
    - **Low temperature and a high salt content raise the density of the water, causing it to sink deep into the ocean.**
    - **The cold, dense water deep below slowly spreads southward**. Eventually, **it gets pulled back to the surface and warms again,** and the **circulation is complete**.
- **Significance**: AMOC **ensures the oceans are continually mixed**, and heat and energy are distributed around Earth.

Ocean Current

- An ocean current is a **continuous, directed flow of seawater within the Earth's oceans**.
- These currents are **like rivers within the ocean, moving large volumes of water** in specific patterns and directions.
- They are a **crucial component of the Earth's climate system** and play a **vital role in regulating global climate, distributing heat** around the planet, and **influencing weather patterns.**
- Ocean currents can be **formed by various factors, including wind, temperature, salinity (salt content), and the Earth's rotation.**

UK opens second ballot for Young Professional visa scheme for Indians

Young Professionals Scheme

- It was conceived as **part of an India-U.K. Migration and Mobility MoU** signed in May 2021 and was **announced in November at the G20 summit in Bali.**
- It was formally **launched in February 2023.**
- It will **permit up to 3,000 of their degree-holding citizens aged between 18 and 30 to live and work in each other's countries for two years.**
- This scheme **makes India the first visa-national country to benefit from the scheme**.
- **Features of India Young Professionals Scheme visa:**
    - It **allows Indian citizens between 18 and 30** years old to **live and work in the UK for up to 2 years.**

- It will enable candidates to **enter the UK at any time while their visa is valid** and **leave and return anytime during their stay**.
- A person **must be selected in the** India Young Professionals Scheme **ballot before they can apply for a Young Professionals Scheme visa.**
- **To be eligible** for the India Young Professionals Scheme visa,
  - You have to be an **Indian national** aged between **18 and 30 years.**
  - You must **have a bachelor's degree or above**.
  - You must **have 2,530 pounds in savings.**
  - You **must not have any children under the age of 18** who live with you or whom you are financially supporting.
- In case the applicant is issued a visa, they **must enter the UK within six months of the date on which the visa was issued**. Once in the UK, the **applicant can:**
  - **Study**for certain degree programs, such as post-graduation or research in sensitive subjects in the UK, an additional certificate under the Academic Technology Approval Scheme (ATAS) needs to be applied before starting the course or research.
  - **Work in most jobs.**
  - **Be self-employed and set up a company** - as long as your premises are rented, your equipment is not worth more than £5,000 and you do not have any employees.

Rail Vikas Nigam Ltd. offer-for-sale over-subscribed, institutional buyers place bids worth ₹2,000 crore

Offer for Sale

- It is a simpler **method of share sale through the exchange** platform for listed companies.
- The mechanism was first introduced by **India's securities market regulator Sebi** in 2012.
- **Aim:** To make it easier for promoters of publicly-traded companies to cut their holdings and comply with the minimum public shareholding norms by June 2013.
- The method was **largely adopted by listed companies**, both state-run and private, to adhere to the Sebi order.
- Later, the government started using this route to divest its shareholding in public sector enterprises.
- In an OFS, promoters of a company will dilute their stake by selling their shares to retail investors, companies, Foreign Institutional Investors (FIIs) and Qualified Institutional Buyers (QIBs) on an exchange platform.
- **Features of Offer for sale**
  - Unlike a follow-on public offering (FPO), where companies can raise funds by issuing fresh shares or promoters can sell their existing stakes, or both, the OFS mechanism is **used only when existing shares are put on the block.**
  - **Only promoters or shareholders holding** more **than 10 per cent** of the share capital in a company can come up with such an issue.

- The mechanism is available to 200 top companies in terms of market capitalisation.
- In an OFS, a **minimum of 25 per cent** of the shares offered, **are reserved for mutual funds** (MFs) and insurance companies.
- At any point, no single bidder other than these two institutional categories is allocated more than 25 per cent of the size of the offering.
- A minimum of **10 per cent of the offer** size is reserved **for retail investors.**
- A seller can offer a discount to retail investors either on the bid price or on the final allotment price.
- It is mandatory for the company to inform the stock exchanges two banking days prior to the OFS about its intention.

Ship carrying nearly 3000 cars ablaze off Dutch coast, crew member dead

North Sea

- It is a **sea in northern Europe** and is **part of the Atlantic ocean**.
- **Borders**: It is bordered by the **United Kingdom and Norway** to the west, **Denmark** to the south, **Germany**, the **Netherlands**, **Belgium**, and **France** to the east, and the **Faroe Islands** and **Norway's Svalbard archipelago** to the north.
- The North Sea **connects to the Atlantic Ocean via the English Channel** in the southwest and the **Baltic Sea in the east via the Kattegat and Skagerrak straits**.
- The **Kiel Canal**, **one of the world's busiest artificial waterways**, **connects the North Sea with the Baltic.**
- **Area**: It covers an area of approximately **570,000 square kilometres** (220,000 square miles).
- **Depth**:
  - It is a **relatively shallow sea** with an **average depth of 90 meters**.
  - The sea's **deepest part** is the **Norwegian trench which is 725 meters deep**.
  - The **shallowest area is the Dogger Bank**, which is only **12 metres deep.**
- **Climate**:
  - It experiences an **oceanic temperate maritime climate** characterized by slightly high temperatures.
  - **Winters are long but cool, while summers are short and mild**.
- **Rivers**: Major rivers that drain into the North Sea include the **Forth, Elbe, the Weser, the Em**s, **the Rhine and Meuse**, the Scheldt, **the Thames, and the Humber.**
- **Ports**: It has **several major ports** located along its coasts, such as **Rotterdam, the busiest port in Europe**, **Antwerp, Hamburg, Bremerhaven** and Felixstowe, all busy container seaports, as well as the Port of Bruges-Zeebrugge, Europe's leading RoRo port.

19-Year-Old Naval Sailor Found Dead Onboard INS Vikrant

INS Vikrant

- It is **India's first indigenously designed and manufactured aircraft carrier**.
- The ship has been **designed in-house by Indian Navy's Warship Design Bureau** and **constructed by M/s Cochin Shipyard Limited.**
- It will strengthen the country's standing as a 'Blue Water Navy' — a maritime force with global reach and capability to operate over deep seas.
- With it, **India also joins the elite group of nations – the US, Russia, France, the UK and China** – who are **capable of designing and constructing aircraft carriers**.
- **Features**:
    - **Dimension**: It has an approximate **length of 262 meters** (860 feet) and a **breadth of 62 meters** (203 feet).
    - **Displacement**: Its full-load displacement is **43,000 tonnes.**
    - **Propulsion**: It is powered by **four gas turbine engines.**
    - **Speed**: It has a top speed of **52 km/h (32 mph).**
    - **Endurance**: **8,600 miles** (13,890 kilometres)
    - **Aircraft capacity**: It can **accommodate up to 30 fixed-wing aircraft**, including fighter jets, and rotary-wing aircraft, such as anti-submarine warfare helicopters and utility helicopters.

INS Vikrant

- **INS Vikrant**, with pennant number R11, was the **first-ever aircraft carrier that was operated by the Indian Navy.**
- The ship was **officially laid down in 1943** and was b**eing built for the Royal Navy as HMS (Her Majesty's Ship) Hercules** when the constitution was put on hold after World War II ended.
- Like many other ships at the time, the under-construction HMS Hercules was **put up for sale by the United Kingdom and was purchased by India in 1957.**
- The **construction work was completed** and the ship was **commissioned in the Indian Navy as INS Vikrant in 1961.**
- The **plan for building an indigenous aircraft carrier started taking shape as the old INS Vikrant neared its decommissioning** in the late 1990s.

Vinesh Phogat and Bajrang Punia to head out to Kyrgystan and Hungary for international training camps

Target Olympic Podium Scheme (TOPS)

- In order to **improve** India's **performance** at **Olympics and Paralympics** it was started the September 2014.
- It is a flagship program of the **Ministry of Youth Affairs and Sports** which is an attempt to provide assistance to India's top athletes.
- It was revamped in 2018 to include a technical support team to manage the TOPS athletes and offer comprehensive assistance.
- The Ministry prioritises the selection of TOPS members, with an emphasis on ensuring representation from high-priority sports such as Archery, Badminton, Boxing, Hockey, Shooting, and Wrestling.
- **Category:** The sports persons are selected mainly in two categories namely; **the Core Group and the Development Group.**
- Out of Pocket Allowance' of **Rs 50,000 per month** is given to the selected Athletes in **Core Group** and **Rs 25,000 per month** to athletes in

Development Group for meeting contingent and miscellaneous expenses.
- To provide assistance to athletes selected under the Scheme, a dedicated body called the **Mission Olympic Cell** was established.
- This body operates under the leadership of the **Director General of the Sports Authority of India.**

Michael Rosen wins this year's PEN Pinter Prize

- It was established in 2009 in memory of Nobel-Laureate playwright **Harold Pinter.**
- The winner must be the **author of a significant body of plays**, poetry, essays, or fiction of outstanding literary merit, written **in English.**
- It is given to a **writer from the UK, Ireland and the Commonwealth** whose work is committed to a fearless exposition of truth about contemporary life.
- The prize is **shared with** an **international writer of courage** selected by English PEN's Writers at Risk Committee in association with the winner.
- This half of the prize is awarded to someone who has been persecuted for speaking out about their beliefs.
- Some of the previous award-winning writers are Malorie Blackman(2022), Tsitsi Dangarembga (2021) Hanif Kureishi (2010), Salman Rushdie (2014), and Lemn Sissay (2019).

Revive Bengaluru's raja kaluves instead of Mekedatu project

Mekedatu Reservoir Project

- The Mekedatu **multi-purpose (drinking and power) project** involves building a balancing **reservoir near Kanakapura in Ramanagara district of Karnataka**.
- It is **4 km from the Tamil Nadu border and 100 km from Bengaluru.**
- The estimated Rs 9,000-crore project, once completed, is **aimed at ensuring drinking water to Bengaluru and neighbouring areas** (4.75 TMC) and it can also **generate 400 MW of power.**
- Named after the village where the project is expected to be constructed, the **reservoir will have a capacity of 284,000 million cubic feet (TMC).**
- The project is **proposed at the confluence of Cauvery with its tributary Arkavathi.**
- **Issue:**
    - **Tamil Nadu — the lower riparian state — has claimed that the project is against the interest of the state's water requirement.**
    - The lower riparian state has to give its no-objection for any project that comes up on the Cauvery as per the Cauvery tribunal and Supreme Court order

India, China ramp up infra on north bank of Pangong Tso lake

Pangong Tso lake

- It is one of the most famous lakes in Leh Ladakh, derives its name from the Tibetan word, "Pangong Tso", which means **"high grassland lake".**
- It is also known as Pangong Lake which is a long narrow, **endorheic (landlocked) lake** situated at a height of more than 14,000 ft (4,350 meters) in the Ladakh Himalayas.

- It is the world's **highest saltwater lake.**
- India holds one-third of the 135 km-long boomerang-shaped Pangong lake.
- One-third of the Pangong Lake lies in India and the other two-thirds in China.
- It is also **known to change colours**, appearing blue, green, and red at different times.

An intriguing exhibition of British-India maps, organised recently by the Asiatic Society of Mumbai

While satellites have taken over the role of mapping in the last 40 years, the most precise method of measuring terrain in the previous two centuries was the **Triangulation survey**.

Like GPS, national triangulation surveys were incredible technological and administrative achievements but often mired in political intrigue. This was especially true in colonised lands like India, as evident from an exhibition titled *"Mapped!"* (May 5-June 4), displayed at the Asiatic Society of Mumbai.

Daunting task

- The principle behind triangulation surveys is calculating the length of a triangle's sides if we know both the length of the base and the angles between the sides. Having calculated the length of two sides in this fashion, we can now use them as bases of new triangles in a spreading network that comprehensively covers a large area.
- The first triangulation survey in India, which later expanded into the **Great Trigonometrical Survey**, was initiated in Madras in 1802 by William Lambton. In 1818, by which time the East India Company
- However simple the idea behind triangulation, in practice mapping a country as massive as India is only possible if the triangles are themselves enormous. Workers of the GTS had access to **theodolites**, precision instruments invented in the late 18th century to calculate horizontal and vertical angles between two visible points, but finding vantage points of visibility at great distances was far from easy.

Lucid and informative notes

- "**A Map of Hindoostan or the Mogul Empire**" published by James Rennell on **January 1, 1788**. This was one of the first nearly accurate maps of India.
- There were places the survey leaders wanted to go to but could not, such as Tibet, which was sealed off from foreigners. That is the ostensible reason why Mount Everest is one of the only two Himalayan peaks (the other being K2/Godwin-Austen) that does not retain its traditional name in English.
- Apparently, a number of local names were floating around and the lack of access to the Roof of the World meant no definitive appellation could be found. And so, the second Superintendent of the GTS received the honour, above his own protestations, of being identified in the world at large with the loftiest spot on the planet.

Scotland's iconic Orkney Islands considering quitting Britain to become part of Norway

Orkney Islands

- It is an archipelago consisting of 70 individual islands, of which only 20 are inhabited.

- The Orkney Islands can be found roughly 10 miles off the **north coast of Scotland.**
- The islands have been inhabited since **prehistoric times** and are home to numerous archaeological sites, including Neolithic stone circles, chambered tombs (such as Maeshowe).
- The four monuments that **make up the Heart of Neolithic Orkney** are unquestionably among the most important Neolithic sites in Western Europe.
- These are the Ring of Brodgar, Stones of Stenness, Maeshowe and Skara Brae.
- Heart of Neolithic Orkney is designated as **UNESCO world Heritage site.**

Archipelago

- An archipelago is a term used to **describe a group or chain of islands** that are closely scattered in a body of water, such as a sea, ocean, lake, or river.
- These islands are typically **formed through geological processes** such as volcanic activity, tectonic movements, or the accumulation of sediment.

Forest dept. embarks on project to conserve, augment fish wealth of Periyar Tiger Reserve

Periyar Tiger Reserve (PTR)

- **Location**: It is located in the **Western Ghats of Kerala.**
- It was **declared a Tiger Reserve in 1978.**
- It gets its **name from the River Periyar** which **has its origin deep inside the reserve.**
- Two **main rivers, Pamba and Periyar drain the reserve.**
- It is home to many t**ribal communities including the Mannans and the Palians.**
- **Terrain**: **Hilly and undulating** with a **maximum altitude of 2016 m.**
- **Vegetation**: It consists of **tropical evergreen, semi- evergreen and moist deciduous.**
- **Flora**:
    - There are more than **171 species of grasses.**
    - Important flora includes t**eak, mangoes, rosewood, jamun**, jacarandas, terminalias, tamarind, royal ponciana, bamboo etc.
- **Fauna**:
    - Includes **Elephants, Wild Pigs, Sambar, Gaur, Mouse Dee**r, Dole or Barking Deer, Indian Wild Dog and Tiger.
    - The **major four species of primates are also found** at Periyar - the **rare lion-tailed macaque, the Nilgiri Langur, Gee's Golden Langur, Common Langur** and Bonnet Macaque.
    - It Is also being considered as the **habitat of the elusive Nilgiri Tahr.**

Kashmir Railway on Track: Around 95% Work Completed on Katra-Banihal Section

Udhampur-Srinagar-Baramulla Rail Link (USBRL) Project

- The USBRL Project involves the **construction of a railway line from Udhampur to Baramulla joining the Kashmir valley with the Indian Railways**
- **Aim**: To **connect Kashmir to the rest of the country** and give a push to

development in the Valley.

- **Total Length:272 km**
- The Project was **declared as a "National Project" in 2002.**
- The alignment of USBRL **involves construction of a large number of Tunnels and Bridges** in highly rugged and mountainous terrain with most difficult and complex Himalayan geology.
- This Project involves **38 Tunnels (combined length of 119 Km), the longest Tunnel (T-49)** having a length **of 12.75 Km and is the country's longest transportation tunnel.**
- There are **927 nos. of Bridges (combined length of 13 Km**). These bridges include the **iconic Chenab Bridge (Overall length 1315 m, Arch span of 467 m** and height of 359 m above Chenab river bed) which will be the **highest railway bridge in the world.**
- **Indian railway's first cable-stayed bridge is also being constructed on Anji Khad.**

Anji Khad Bridge

- It is an **under-construction railway bridge in the Reasi district of Jammu and Kashmir.**
- It will be the **first cable-stayed railway bridge in India.**
- **Features**:
    - It is an **asymmetrical cable-stayed bridge balanced on the axis of a central pylon**, and it **has tunnels on both ends.**
    - The **cable-stayed portion of the Anji bridge is 472.25 metres**, while the **total length of the bridge is 725.5 metres**, which is divided into four parts, including an embankment.
    - The **central span of the bridge is 290 metres;** its total deck width will be 15 metres.
    - It **stands at the height of 331 metres** above the Anji river bed.
    - Trains can run up to 100km/h, and the bridge can withstand wind speeds up to 213 km/hr.

US destroys last of its declared chemical weapons stockpile

- The U.S. faced a September 30 deadline to eliminate its remaining chemical weapons under the international Chemical Weapons Convention.

Chemical Weapons Convention

- It is a **multilateral treaty** that bans chemical weapons and requires their destruction within a specified period of time.
- It entered into **force on April 29, 1997.**
- It requires states-parties to declare in writing to the OPCW their chemical weapons stockpiles, chemical weapons production facilities (CWPFs), relevant chemical industry facilities, and other weapons-related information.
- The CWC is open to all nations and currently **has 193 states-parties.**
- **India is a signatory and party** to the Chemical Weapons Convention.
- It has signed the treaty at Paris on 14th day of **January 1993.**
- It is pursuant to provisions of the Convention enacted the Chemical Weapons Convention Act, 2000.

Organisation for the Prohibition of Chemical Weapons (OPCW)

- It is the **implementing body** of the Chemical Weapons Convention (CWC).

- **Mission:** To implement the provisions of the Chemical Weapons Convention (CWC) in order to achieve the OPCW's vision of a world that is free of chemical weapons and of the threat of their use, and in which cooperation in chemistry for peaceful purposes for all is fostered.
- **Headquarters:** Hague, Netherlands.
- It receives states-parties' declarations detailing chemical weapons-related activities or materials and relevant industrial activities.
- It is authorized to perform inspections to verify that signatory states are complying with the convention.
- It also performs **testing of sites and victims of suspected** chemical weapons attacks.