GS SCORE
An Institute for Civil Services

OCTOBER 2023

GS ANALYST

MONTHLY CURRENT AFFAIRS MAGAZINE

- Coverage of Monthly topics for GS Paper 1,2 , 3 & 4
- Key Concepts & Prelims Specific Topics
- Questions for Answer Writing Practice

PRELIMS

- Project Udbhav
- Specialised and Local Laws (SLLs)
- National Turmeric Board
- Bihar Caste-Based Survey
- 'Baiga' Tribal Group gets habitat rights

MAINS

- Supreme Court's decision on Same-sex marriages
- Glacial lake outburst Floods (GLOF)
- Scientists discover "Pontus plate"
- China-Philippines tussle 'Five Eyes' intelligence alliance
- Elevating India-Tanzania Relations

KEY CONCEPTS

- Mission Shakti 4.0
- Global Innovation Index 2022
- Nuclear-powered lander for Saturn's moon Titan
- MicroRNA Therapy
- Matangini Hazra
- Yellow Sea

CONTEMPORARY ISSUE BASED ESSAY

MINDFUL MANIFESTO IS THE CATALYST TO A TRANQUIL SELF

— Disclaimer —

The current affairs articles are segregated from prelims and mains perspective, such separation is maintained in terms of structure of articles. Mains articles have more focus on analysis and prelims articles have more focus on facts.

However, this doesn't mean that Mains articles don't cover facts and PT articles can't have analysis. You are suggested to read all of them for all stages of examination.

CURRENT AFFAIRS MONTHLY

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I am highly obliged towards GS SCORE for its best evaluation and assessment mechanism which helped me to crack UPSC in first attempt.

YASHARTH SHEKHAR (AIR 12, 2021)

I am very thankful to GS Score for realizing my dreams into reality. The well-crafted all India Test Series helped me a lot and augmented my score significantly.

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Section A [MAINS]

- Mental Health Issues amongst Children in India
- India faces a tough battle ahead in protecting its female population from anaemia
- Government issued guidelines to prevent suicide among students
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- Glacial lake outburst Floods (GLOF)
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MENTAL HEALTH ISSUES AMONGST CHILDREN IN INDIA

Context: **As per the National Mental Health Survey (NMHS) conducted in 2015-16, the prevalence of mental disorders among children between ages 13-17 was around 7.3% in both genders, which has been ignored under policies by the government.**

- However, the Parliament is yet to develop a framework for a national-level school mental health Programme.

Key Points of consideration from NMHS:

- The survey **2015-16** showed how young children, especially girls, are vulnerable to **sexual coercion**, unwanted pregnancies, unsafe abortions, physical injuries and digital challenges like cyber-bullying, internet addiction and pornography.
- These risks in turn affect their physical as well as mental well-being.
- 26.8% girls were getting married below the legal age, while **8% of girls** between **ages 15-19** were already **mothers or pregnant**.
- The survey also found that **37% of women** between ages 15-24 have experienced **physical, sexual, or emotional violence** by their husbands.

Need to consider mental health of Children:

- As per a report from **United Nations International Children's Emergency Fund (UNICEF)**, any mental health Programme in schools must include five pillars of support —
  - An enabling learning environment,
  - Access to early intervention and mental health services,
  - Teachers' well-being,
  - Targeted mental health programmes using educational workforce in national,
  - State and local levels and meaningful collaboration between school, family and community.
- Under existing **educational policies, plans and budgets**, UNICEF lays a basic framework for how to build a school mental health programmes:
  - employ dedicated counselors
  - guarantee access to Tele-health mental health services
  - promote government-issued helpline numbers
  - maintain sufficient workforce of teaching and non-teaching staff to ensure teacher well-being
  - promote community-based activities
  - spread awareness on mental health, its issues as part of school curriculum
  - Collaborate with families, communities to better tailor the Programme, monitor children's health - leading to increased confidence, trust in relationships.
- The UNICEF guidelines are still to be achieved in India.

Issues with mental health Programme in India:

- **Severe Shortage of Mental Health Professionals:** India faces a critical scarcity of mental health professionals, with inadequate psychiatrists, nurses, and psychologists.
- **Lack of Comprehensive School Mental Health Programme (SMHP):** Absence of a nationwide SMHP results in limited initiatives, like teacher training and helplines, insufficiently addressing children's mental health.
- **Inadequate Government Funding for Mental Health:** India allocates only **1.3%** of its health expenditure to mental health, a fraction of the total health budget.

Government Initiatives:

- In 1982, India launched the **National Mental Health Programme (NMHP)** to ensure access to minimum mental healthcare for all, encourage inclusion of mental health knowledge in general medical services and to promote community participation in mental health service programmes.
- Under the NMHP, the **District Mental Health Program (DMHP)** was launched in 1996, covering some basic elements — early detection and treatment, training general physicians to diagnose and treat mental illnesses, public awareness and monitoring.
- The National Mental health policy, adopted in 2017, sought to destigmatise mental illnesses, take steps to prevent such illnesses and include those suffering from mental health issues in society.
- In 2018, the government launched the **School Health Programme** under the aegis of the Ayushman Bharat scheme, launched the same year.

Suggestive Measures:

- Focusing on mental health of middle and high school children, the Programme outlines health promotion activities like **meditation and yoga**, bullying prevention, internet safety and media literacy, prevention of substance abuse, violence and mental health awareness.

- Coordination committees at the **block, district, State and national levels** have been tasked with the implementation of the Programme.
- These committees are to comprise of **teachers, district magistrates, education and health officers, state secretaries and Union ministry representatives.**

INDIA FACES A TOUGH BATTLE AHEAD IN PROTECTING ITS FEMALE POPULATION FROM ANAEMIA

Context: **At the recent International Conference on Maternal & Child Health and Nutrition, countries like India, Nepal, Bangladesh, Malaysia, the USA, and the Netherlands witness the power of collective determination united by a shared vision – to combat anemia and malnutrition that continue to cast a shadow over the lives of countless mothers and children all across the world.**

Situation in India:

- **Stunting-** While there was some reduction in stunting rates (35.5% from 38.4% in NFHS4) **13 States** or Union Territories have seen an increase in stunted children since **National Family Health Survey (NFHS4).**
  - This includes **Gujarat, Maharashtra, West Bengal and Kerala.**
- **Malnutrition**- Malnutrition trends across NFHS surveys show that wasting, the most visible and life threatening form of malnutrition has either risen or has remained stagnant over the years.
- **Anaemia**-India also has the highest prevalence of anaemia in the world. The NFHS5 survey indicates that more than **57% of women (**1549 years) and over **67% children** (six59 months) suffer from anaemia.

Though the Indian government's flagship Programme – **Anemia Mukt Bharat**, adopts robust strategies, anemia remains a severe public health concern irrespective of the middle and high-wealth quintile.

About Anaemia

- Anemia is defined as a low number of red blood cells. In a routine **blood test,** anemia is reported as a low **hemoglobin or hematocrit**.
  - Hemoglobin is the main protein in your red blood cells. It carries oxygen, and delivers it throughout your body.

The **World Health Organsiation (WHO)** defines anaemia as a condition where the **number of red blood cells** or the **haemoglobin concentration** within them is lower than normal. This compromises immunity and impedes cognitive development.

- **Symptoms of anemia**: Fatigue or shortness of breath.

Why anaemia is a concern?

- Anaemia affect all age groups which causes lower physical and cognitive growth and alertness among **children and adolescents**, and lesser capacity to learn and play, directly impacting their future potential as productive citizens.
- Anaemia among **adolescent girls (59.1 per cent)** advances to maternal anaemia and is a major cause of maternal and infant mortality and general morbidity and ill health in a community.

What causes anaemia?

- **Imbalanced diet:** Cereal-centric diets, with relatively less consumption of iron-rich food groups like meat, fish, eggs, and dark green leafy vegetables (DGLF), can be associated with higher levels of anaemia.
- **Underlying factors**: High levels of anaemia are also often associated with underlying factors like poor water quality and sanitation conditions that can adversely impact iron absorption in the body.
- **Iron deficiency is major cause**: A diet that does not contain enough iron, folic acid, or vitamin B12 is a common cause of anaemia.
- **Some other conditions:** That may lead to anaemia include pregnancy, heavy periods, blood disorders or cancer, inherited disorders, and infectious diseases.

Reasons for high Anaemia numbers in India:

- **Low vitamin intake**: **Iron-deficiency** and **vitamin B12-deficiency anaemia** are the two common types of anaemia in India.
- **High population and nutrition deprivation**: Among women, iron deficiency prevalence is higher than men due to menstrual iron losses and the high iron demands of a growing foetus during pregnancies.
- **Overemphasis on cereals**: Lack of millets in the diet due to overdependence on rice and wheat, insufficient consumption of green and leafy vegetables could be the reasons behind the high prevalence of anaemia in India.

Anaemia Mukt Bharat:

- The scheme aims to reduce the prevalence of anaemia in India.

- It provides bi weekly iron Folic acid supplementation to all under five children through Asha workers.
- Also, it provides biannual Deworming for children and adolescents. The scheme also establishes institutional mechanisms for advanced research in anaemia.
- It also focuses on non-nutritional causes of anaemia.

Other Initiatives:

- **Surakshit Matritva Aashwasan (SUMAN)** provides assured, dignified, respectful and quality healthcare at no cost and zero tolerance for denial of services for every woman and newborn visiting public health facilities to end all preventable maternal and newborn deaths.
- **Janani Suraksha Yojana (JSY),** a demand promotion and conditional cash transfer scheme for promoting institutional delivery.
- **Under Janani Shishu Suraksha Karyakram (JSSK),** every pregnant woman is entitled to free delivery, including caesarean section, in public health institutions along with the provision of free transport, diagnostics, medicines, other consumables & diet.
- **Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA)** provides pregnant women a fixed day, free of cost assured and quality antenatal check up by a Specialist/Medical Officer on the 9th day of every month.
- **LaQshya** improves the quality of care in labour room and maternity operation theatres to ensure that pregnant women receive respectful and quality care during delivery and immediate post-partum.
- **Monthly Village Health, Sanitation and Nutrition Day (VHSND)** is an outreach activity at Anganwadi centers for provision of maternal and child care including nutrition in convergence with the ICDS.
- **Delivery Points**- Over 25,000 'Delivery Points' across the country have been strengthened in terms of infrastructure, equipment, and trained manpower for provision of comprehensive RMNCAH+N services.
- **MCP Card and Safe Motherhood Booklet** are distributed to the pregnant women for educating them on diet, rest, danger signs of pregnancy, benefit schemes and institutional deliveries.
- **Reproductive and child health (RCH) portal** is a name-based web-enabled tracking system for pregnant women and new born so as to ensure seamless provision of regular and complete services to them including antenatal care, institutional delivery and post-natal care.

Suggestive measures:

- There's a critical need for the government to create **stronger partnerships with non-profits**, especially the ones working ground not just for broader iron-folic acid supplementation programmes but also compliance, targeting all wealth quartiles and more effective **social and behavior change** campaigns that drive positive action.
- To address the issue, we need to allocate sufficient resources to programs like the Integrated Child Development Scheme, mid-day meals, and public distribution schemes, with a **focus on pregnant women and the first 1000 days of a child's life.**
- Promoting healthy eating habits requires considering cultural, social, and economic factors, and we should also combat the impact of advertising unhealthy foods while investing in nutrition-focused interventions and strengthening healthcare resources.
- **Iron fortification can be used**: Fortification of food is a methodology utilized worldwide to address iron deficiency. Iron fortification programs usually involve mandatory, centralized mass fortification of staple foods, such as **wheat flour**.

Conclusion

When a person is anaemic, the capacity of his blood cells to carry oxygen decreases. This reduces the productivity of the person which in turn affects the economy of the country. Therefore, it is highly important to cover Anaemia under **National Health Mission**.

GOVERNMENT ISSUED GUIDELINES TO PREVENT SUICIDE AMONG STUDENTS

Context: **Recently the Union Ministry of Education (MoE) has released draft guidelines titled 'UMMEED (Understand, Motivate, Manage, Empathise, Empower, Develop)', to serve as directions to schools for enhancing sensitivity, understanding, and providing support in case of reported self-harm and preventing suicides.**

About the initiative:

- The draft guidelines for schools to prevent suicide among students, prescribing in its '**plan of action**' includes;

- Setting up of wellness teams,
- Orientation of teachers and family members, and
- Immediate response to students exhibiting warning signs.

- A **school wellness team (SWT)** may be formed under the leadership of the **school principal,** where each member is oriented in handling crisis situations.
- The guidelines recommend an orientation a year **for teachers and family members**, to help build awareness around student suicides.
  - These orientations will be conducted by the schools for the capacity-building of various stakeholders.
- Immediate response to a **student exhibiting warning signs**: The guidelines list the actions that may be taken by an **individual at the school**, or the member of the wellness team on coming across such a case.
- Schools have also been asked to work towards building the capacity of all stakeholders.
- **Other recommendations:**
  - To enhance students' **knowledge and encourage peer support**,
  - Organizing activities on a regular basis for relaxing and reducing stress,
  - Providing channels for expression,
  - Compiling resources to seek support,
  - Integrating mental well-being in school functioning,
  - Creating a safe environment in school and beyond including vigilance at railway tracks, river banks, bridges, cliffs medical shops, etc.

Suicide Warning Signs:

- Most suicidal youth demonstrate observable behaviors that signal their suicidal thinking. These include:
  - Suicidal threats in the form of **direct and indirect statements**.
  - Suicide notes and plans (including online postings).
  - Prior suicidal behavior.
  - Making final arrangements (e.g., making funeral arrangements, writing a will, giving away prized possessions).
  - Preoccupation with death.
  - Changes in **behavior, appearance, thoughts and/or feelings**.

Need for such an initiative:

- Suicide is the leading cause of death among school age youth.
- However, suicide is preventable. Youth who are contemplating suicide frequently give warning signs of their distress.
- Parents, teachers, and friends are in a key position to pick up on these signs and get help.
- Most important is to never take these warning signs lightly or promise to keep them secret.
- When all adults and students in the school community are committed to making suicide prevention a priority-and are empowered to take the correct actions-we can help youth before they engage in behavior with irreversible consequences.

The Role of the School/Educational Institution in Suicide Prevention:

- Children and adolescents spend a substantial part of their day in school under the supervision of school personnel.
- Effective suicide and violence prevention is integrated with supportive mental health services, engages the entire school community, and is imbedded in a positive school climate through student behavioral expectations and a caring and trusting student/adult relationship.
- Therefore, it is crucial for all school staff members to be familiar with and watchful for, risk factors and warning signs of suicidal behavior.
- The entire school staff should work to create an environment where students feel safe sharing such information.
- School psychologists and other crisis response team personnel, including the school counselor and school administrator, are trained to intervene when a student is identified at risk for suicide.
- These individuals conduct suicide risk assessment, warn/inform parents, provide recommendations and referrals to community services, and often provide follow up counseling and support at school.

The Kota Story:

- Kota, a city in Rajasthan, gained notoriety for a high number of **student suicides**, primarily among those preparing for competitive exams **like IIT-JEE and NEET.**
- **Reason for suicide**: The suicides were often attributed to the intense **academic pressure, rigorous coaching, and parental expectations placed on these students, leading to stress, anxiety, and mental health issues.**

According to data, **15 students died by suicide in Kota in 2022**, 18 in 2019, while the figure was 20 in 2018, seven in 2017, 17 in 2016, and 18 in 2015.

- The Kota suicide story prompted discussions on the need for educational reform, including reducing exam stress, providing mental health support, and fostering a more balanced approach to education.

Way forward:

- **Pandemic's Impact on Mental Health**: The COVID-19 pandemic has exacerbated mental health issues across communities, bringing attention to the neglected field of mental health in India.
- **Increased Budget Allocation**: The National Mental Health Programme's budget has increased to Rs.134 crore for 2023-24 from a mere Rs.40 crore before the pandemic.
- **Long-Term Engagement Needed**: Addressing the crisis requires a comprehensive, ongoing effort involving parents, educators, policymakers, and mental health professionals.

Conclusion

As the number of suicides among students is increasing, it shows that there is a lack of safe spaces, compassionate faculty, and individualized support for struggling students. The pressure, guilt, and helplessness they experience often lead to tragic outcomes. Thus, helping those students is the foremost requirement.

SUPREME COURT'S DECISION ON SAME-SEX MARRIAGES

Context: **A majority view on a five-judge Constitution Bench of the Supreme Court refuses to legalise 'same-sex marriages' or 'civil unions' in India mentioning that non-heterosexual couples cannot claim an unqualified right to marry.**

Timeline of the LGBTQIA+ Movement in India:

- During British rule in 1860, **homosexual intercourse** was considered unnatural and was declared a criminal offence under Chapter 16, **Section 377 of the Indian Penal Code (IPC).**
- After independence, on November 26, 1949, the **Right to Equality** was implemented under Article 14 but homosexuality still remained a criminal offence.

Global Scenario:

- Today, at least **12 nations** allow civil unions or registered partnerships for homosexual couples.
- **Croatia, the Czech Republic, Greece, Hungary, Italy, Slovenia, and Estonia** have such laws.
- **Austria, Sweden, Norway, Brazil** and **Chile** are among the nations that **first** recognised the right of same-sex couples to enter into civil unions before recognizing their **legal right to marriage.**

- Decades later, on August 11, 1992, the first known **protest for gay rights** was held.
- In 1999, Kolkata hosted **India's first Gay Pride Parade**. The parade, with only 15 attendees, was named Calcutta Rainbow Pride.
- In 2009, a landmark Delhi High Court decision in the **Naz Foundation v. Govt. of NCT of Delhi** case held that treating **consensual homosexual consummation** between adults as a crime is a violation of fundamental rights protected by India's Constitution.
- In the **Suresh Kumar Koushal and another v. NAZ Foundation** and others case in 2013, the Supreme Court overturned the Delhi High Court Naz Foundation v. Govt. of NCT of Delhi case and **reinstated Section 377 of the Indian Penal Code.**
- In late 2015, MP Shashi Tharoor introduced a bill to **decriminalise homosexuality** but it was rejected by the Lok Sabha.
- In August 2017, the Supreme Court upheld the **right to privacy as a fundamental right** under the Constitution in the landmark **Puttuswamy judgement.** This gave renewed hope to LGBT activists.
- On September 6, 2018, the Supreme Court ruled unanimously that Section 377 was unconstitutional "**in so far as it criminalises consensual sexual conduct between adults of the same sex".**
- The battle against **Section 377** has ended but the bigger battle for equal rights for the LGBT community is still ongoing.

Recent views of the Supreme Court (SC):

- Two judges including the CJI gave their views in favour of same-sex marriage, mentioning that "**Discrimination on the basis of sexual orientation is violative of Article 15 of the Constitution".**
- The minority views of the two judges held that the '**Right to enter into a union'** cannot be restricted on the basis of sexual orientation.
- The majority views of **Justices S.R. Bhat, Hima Kohli and P.S. Narasimha** disagreed on the point, holding that it was for the legislature, and **not the Court,** to formally recognise and grant legal status to non-heterosexual relationships.
- Justice Bhat disagreed with the Chief Justice's interpretation that the right to form a civil union by same sex couples flowed from their **right to choose a partner, right to life and free expression.**
- But all the five judges on the Bench agreed that the **Special Marriage Act of 1954** was **not unconstitutional** for excluding same-sex marriages.

Court's final Verdict:

- The court highlighted that; it cannot initiate the construction of a "**parallel framework**" of the institution of marriage. Such recognition was not based on law.
- The court has broadly ordered that it was for the **Parliament and State legislature** to enact laws on such marriage.
- The court urged the government to form a **high-powered committee** chaired by the Union Cabinet Committee to expeditiously look into genuine human concerns faced by **same-sex partners**.
- Also they suggested that the committee should look into whether queer couples could be treated as members of the same family for the **purpose of ration card; succession; maintenance; opening of a joint bank account; arrangement of last rites of partners; access benefits of rights and benefits of employment, etc.**
- It also clearly mentioned that **Right to marry** is not a Fundamental Right under Article 21 or Article 15.

The right to marriage was a **statutory right** or flowing from a custom.

How union of Couple is defined in Indian Laws?

- A "civil union" is a legal status that bestows upon same-sex couples some **rights and responsibilities** which are allowed to heterosexual **married men and women**.
- Civil union gives couples employment, inheritance, property and parental rights. However, there are some differences between a marriage and a civil union.

Central Government's say:

- During hearings in the case, the Centre had submitted that it would set up **a committee** headed by the Cabinet secretary to look into practical difficulties faced by same-sex couples.
- These include getting rights to Provident Fund, and pension benefits among others.

Earlier Views of Supreme Court on Same-Sex Marriages:

- Marriage as a Fundamental Right (**Shafin Jahan v. Asokan K.M. and others 2018):**
  - While referring to Article 16 of the Universal Declaration of Human Right and the Puttaswamy case, the SC held that the right to marry a person of one's choice is integral to **Article 21** of the Constitution.
  - **Article 16 (2)** in the Indian constitution provides that there cannot be any discrimination on grounds only of **religion, race, caste, sex, descent, place of birth, residence or any of them**.
  - The right to marry is intrinsic to the liberty which the Constitution guarantees as a fundamental right, as the ability of each individual to take decisions on matters central to the pursuit of happiness. Matters of belief and faith, including whether to believe are at the core of constitutional liberty.
- LGBTQ Community Entitled to all Constitutional Rights (Navjet Singh Johar and others v. Union of India 2018):
  - The SC held that members of the LGBTQ community "are entitled, as all other citizens, to the full range of constitutional rights including the liberties protected by the Constitution" and are entitled to equal citizenship and "equal protection of law".

What is the Special Marriage Act?

- The **Special Marriage Act (SMA), 1954** is an Indian law that provides a legal framework for the marriage of people belonging to different **religions or castes.**
- It governs a civil marriage where the state sanctions the marriage rather than the religion.
- The Indian system, where both **civil and religious marriages** are recognized.

- **Applicability:** The applicability of the Act extends to the people of all faiths, including **Hindus, Muslims, Sikhs, Christians, Sikhs, Jains, and Buddhists, across India.**
- **Recognition of Marriage:** The Act provides for the registration of marriages, which gives legal recognition to the marriage and provides a number of legal benefits and protections to the couple, such as inheritance rights, succession rights, and social security benefits.
  - It forbids polygamy and declares a marriage null and void if either party had a spouse living at the time of the marriage or if either of them is incapable of giving valid consent to the marriage due to unsoundness of mind.
- **Written Notice:** Section 5 of the Act specifies that the parties must give written notice to the Marriage Officer of the District and that at least one of the parties must have lived in the district for at least 30 days immediately before the date of such notification.
  - Section 7 of the Act allows "**any person to object to the marriage before the expiration of 30 days from the date of the notice's publication."**
- **Age Limit:** The minimum age to get married under the SMA is **21 years** for **males** and **18 years for females.**

LGBTQAI+ Community:

- The LGBTQAI+ acronym stands **for Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, and Asexual and others.**
- They are the people who don't identify with cisgender heterosexual "ideals".
- In India, the LGBTQIA+ community also includes a specific social group, a distinct community: the Hijras.
- They are culturally defined either as "**neither men, nor women**", or as men who behave like a woman.
- At present they are referred to as **the Third Gender**.

Issues related to 'Third Gender' in India

- **Discrimination in the educational setup and workplace:** The majority of the people in this community is either illiterates or has less education, because of which they are not able to get involved much in the educated section of the society.
  - According to a census which was conducted in 2011 the population of transgender people was 4.9 lakhs and in which only 46% of people were literate which is extremely less compared to the normal population which has a **literacy rate of 74%.**
- **Social exclusion:** Since the transgender communities lack education and employment opportunities they are looked upon as a **lower class** by society resulting in exclusion.
  - Their self-esteem and self-confidence hit really hard because of this exclusion and they end up taking undesirable jobs**.**
- **Lack of legal protection and victims to hate crimes**: The Transgender community is not legally protected as much as any other community and because of this; they are easily victimized for the crimes that they didn't even commit. They undergo a **lot of violence and become victims of hate crimes.**
- **High Unemployment rate:** According to the right to education act, they are categorized as a 'disadvantage group' which means they have 25% reservation as an economically weaker section.

Suggestions:

- **Raise Awareness**: The purpose of awareness campaigns is to promote equality and acceptance of all sexual orientations and expand public opinion about the LGBTQIA+ community.
- **Legal Reforms**: Amendments in the Special Marriage Act, 1954 to allow same-sex couples to legally marry and enjoy the same rights and benefits as opposite-sex couples.
  - Meanwhile bring the contract like agreement so that homosexual people can enjoy similar rights like heterosexuals.
- **Dialogue and Engagement**: Engaging in a dialogue with religious leaders and communities can help bridge the gap between traditional beliefs and modern attitudes towards same-sex relationships.
- **Legal Challenges**: The Indian LGBTQIA+ community can challenge the constitutionality of the current laws that prevent same-sex marriage in court. Such legal challenges can help establish a legal precedent that will pave the way for the legalization of same-sex marriage.
- **Collaboration**: The legalisation of same-sex marriage requires a concerted effort from all stakeholders, including the LGBTQIA+ community, the government, civil society, and religious leaders.
  - By working together, we can create a more inclusive society where everyone has the right to love and marry whomever they choose, regardless of their gender.

Conclusion:

Our country has passed an act (Transgender protection act) that aims at protecting their rights and they are not subjected to any kind of discrimination in **healthcare, education, and employment.** Our responsibility as civilians is to treat them equally and give them equal respect as any other gender.

GLACIAL LAKE OUTBURST FLOODS (GLOF)

Context: **Recently, the Flash floods occurred in Sikkim after the South Lhonak Lake, a glacier lake located in the northwest region of the state, burst due to incessant rains.**

What is Glacial Lake?

- Glacial lakes are large bodies of water that **sit in front of, on top of, or beneath** a melting glacier.
- As they grow larger, they become more dangerous because glacial lakes are mostly dammed by unstable ice or sediment composed of loose rock and debris.

What is Glacial Lake outburst?

- When the boundary around unstable glacial lake breaks, and huge amounts of water rush down the side of the mountains, which could cause flooding in the downstream areas.
- This is called glacial lake outburst floods or GLOF.
- **Factors causing GLOF**:
  - GLOF can be triggered by several reasons, including earthquakes, extremely heavy rains and ice avalanches.
- These lakes are also often found in **steep, mountainous regions**, which means landslides or ice avalanches can sometimes fall directly into the lakes and displace the water, causing it to **over-top the natural dam and flood downstream.**

Features of GLOF:

- They involve sudden (and sometimes cyclic) releases of water.
- They tend to be rapid events, lasting hours to days.
- They result in large downstream river discharges (which often increase by an order of magnitude).

In 2013, one such event took place in **Uttarakhand's Kedarnath** when the region witnessed flash floods along with a GLOF caused by the **Chorabari Tal glacial lake.**

Why glacial lakes are now more susceptible to melting in Sikkim?

- With the rising global temperatures, glaciers in Sikkim Himalayan have been melting rapidly, giving rise to many glacier lakes and expanding the already existing ones in the region.

There are currently more than **300 glacial lakes in Sikkim Himalayan**, according to the Sikkim State Disaster Management Authority.

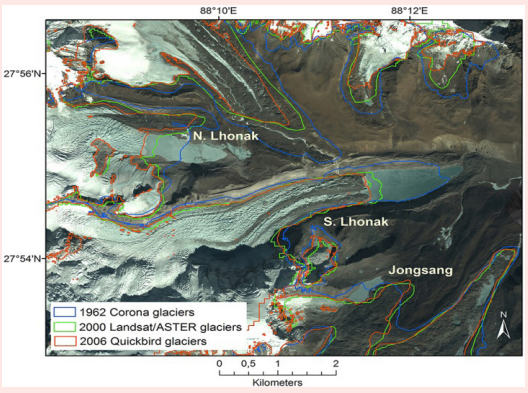
- Out of these, 10 have been identified as **vulnerable to outburst floods**.

Ways to reduce its impact:

- The NDMA released guidelines on how to deal with disasters caused by GLOFs. According to the guidelines, risk reduction begins with the identification and mapping of glacial lakes.
- Taking structural measures to avoid their breach and establishing robust mechanisms to save life and property in the event of a breach.
- Using Synthetic-Aperture Radar imagery to automatically detect changes in water bodies, including new lake formations, during the monsoon months.
- It also suggested that methods could be developed to permit remote monitoring of lakes from space.
- To manage lakes structurally, the NDMA recommends decreasing the volume of water with methods like controlled breaching, pumping or siphoning out water, and making a tunnel through the moraine barrier or under an ice dam.

South Lhonak Lake: the Location

- South Lhonak Lake is a **glacial-moraine-dammed lake**, located in Sikkim's far northwestern region.
- The lake is located at **5,200 m (17,100 ft)** above sea level.
- It formed due to the melting of **the Lhonak glacier.**
- It is one of the fastest expanding lakes in the Sikkim Himalaya region, and one of the 14 potentially dangerous lakes susceptible to glacial lake outburst flood.

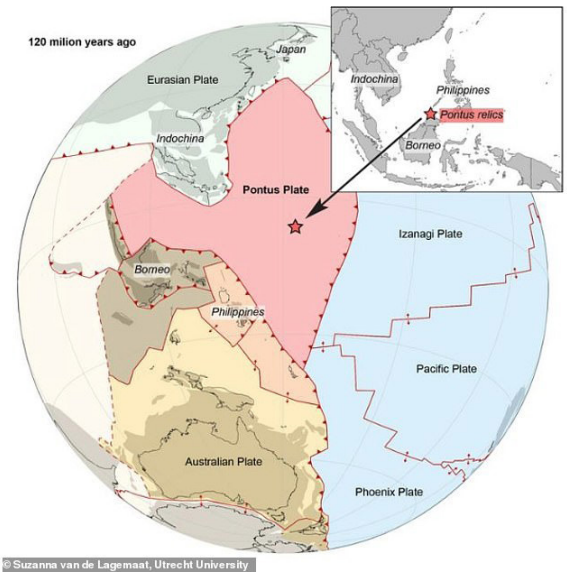


SCIENTISTS DISCOVER "PONTUS PLATE"

Context: **Scientists discover a long-lost tectonic plate 'Pontus', an ancient mega-plate that disappeared 20 million years ago.**

What is Pontus (Key-Findings)?

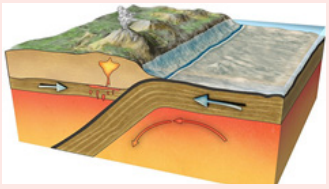
- Pontus is a **tectonic plate** that existed around **150 million years ago** in the western Pacific.
- **Size:** Called Pontus, the 'mega-plate' was once 15 million square miles, about a quarter the size of the Pacific Ocean today. But over time it was subducted into Earth's mantle and eventually lost.
- **Name game:** Scientists have dubbed it the "Pontus plate" because at the time of its existence, it sat under an ocean known as the Pontus Ocean.
- **Location:** The plate is known only from a few rock fragments from the mountains of **Borneo** and the ghostly remnants of its huge slab detected deep in Earth's mantle.
  - In addition to northern Borneo, Pontus plate relics were found in **Palawan**, an island in the **Western Philippines**, and the **South China Sea.**
- The study was published in the journal ***Gondwana Research.***



Why did it disappear?

- Pontus has been gradually sub ducted beneath the earth over the last millions of years. Scientists believe this gravitational force came from a neighbouring plate.
- In the ancient geological past, large plates have since disappeared into Earth's mantle by means of 'subduction'.

Subduction:



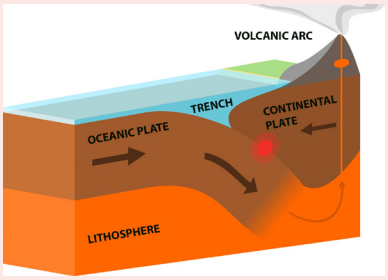
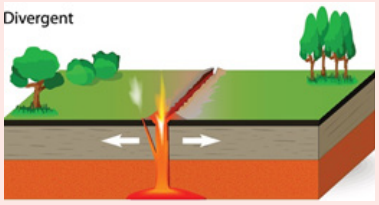
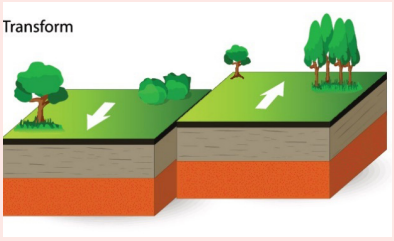
- Subduction is the **geologic process** in which one edge of one lithospheric plate is forced below the edge of another – and over time an entire plate can be lost.
- Crucially, a subducted plate leaves behind traces when it 'sinks' into Earth's mantle – namely, fragments of rock hidden in mountain belts.
- It is an on-going process.

What led to the discovery?

- Background: Scientists predicted the existence of the Pontus about a decade ago. The prediction came after they discovered fragments of old tectonic plates deep in the Earth's mantle.
- In the current study, scientists reconstructed the lost plates by combining field research with extensive investigations of Japan, Borneo, the Philippines, New Guinea, and New Zealand Mountain belts.
- These areas were believed to be the "most complicated plate tectonic region."

What are Tectonic Plates?

- Plate tectonics is a scientific theory that explains how major landforms are created as a result of Earth's subterranean movements.
- The theory, which solidified in the 1960s, transformed the earth sciences by explaining many phenomena, including mountain building events, volcanoes, and earthquakes.
- In plate tectonics, Earth's outermost layer, or lithosphere—made up of the crust and upper mantle—is broken into large rocky plates.
- These plates lie on top of a partially molten layer of rock called the asthenosphere.
- Due to the convection of the asthenosphere and lithosphere, the plates move relative to each other at different rates, from two to 15 centimetres (one to six inches) per year.
- This interaction of tectonic plates is responsible for many different geological formations such as the **Himalaya mountain range in Asia, the East African Rift, and the San Andreas Fault in California, United States.**

Convergent Boundaries	• A convergent plate boundary is formed by tectonic plates crashing into each other. • Convergent boundaries are often subduction zones, where the heavier plate slips under the lighter plate, creating a deep trench. This subduction changes the dense mantle material into buoyant magma, which rises through the crust to Earth's surface. Over millions of years, the rising magma creates a series of active volcanoes known as a volcanic arc.	
Divergent Boundaries	• A divergent boundary is formed by tectonic plates pulling apart from each other.	
Transform Boundaries	• A transform boundary is formed as tectonic plates slide horizontally past each other. Parts of these plates get stuck at the places where they touch. • Stress builds in those areas as the rest of the plates continue to move. • This stress causes the rock to break or slip, suddenly lurching the plates forward and causing earthquakes. These areas of breakage or slippage are called faults.	

WHY ARE EARTHQUAKES FREQUENT IN AFGHANISTAN?

Context: Recently, an earthquake of magnitude 6.3 struck Western Afghanistan, after the one struck the Herat province.

- Multiple earthquakes within a short duration of time have led to the **damage of villages and property** in Afghanistan.

About Earthquake:

- An earthquake is the **shaking of the surface of the Earth**, resulting from the sudden release of energy in the Earth's lithosphere that creates seismic waves.
- Earthquake is the **form of energy of wave** motion transmitted through the **surface layer of the earth**.
- It may be due to **faulting, folding, plate movement, volcanic eruptions** and anthropogenic factors like dams and reservoirs.

Vulnerability of the Region:

Afghanistan is a tectonically complex zone developed as a result of the collision between the **Eurasian plate** and the **Indian plate** to the southeast and the **Arabian plate to the south**. The active tectonics of the country is distinguished by a wide zone of crustal deformation. A few of the reasons include;

- **Plate Interactions:** Afghanistan is situated at the convergence of the **Indian and Eurasian tectonic plates**, giving rise to heightened tectonic activity.
- **Plate Boundaries:** Western Afghanistan experiences subduction of the **Arabian plate northward** under Eurasia, while the eastern part witnesses similar subduction of the Indian plate.
- **Geological Complexity:** Hindu Kush mountain range and **Pamir Knot**, where plates meet, exhibit complex folding and faulting due to the collision and convergence of plates.
- **Compression and Earthquakes:** Northward movement of the Indian Plate towards Eurasia induces compression, leading to the uplift of the Himalayas and transmission of tectonic stress. This causes crustal deformation, generating earthquakes.

Active Fault Systems in Afghanistan:

- **Chaman Fault**: A significant fault system in Afghanistan known for its seismic activity.
- **Main Pamir Thrust**: Another active fault system contributing to seismic events in the region.

The Location:

- Afghanistan is located in Central Asia with Iran to the west and Pakistan to the east.
- It is a landlocked country located in Southern Asia that borders **China, Iran, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan.**

- **Capital:** Kabul
- **Official Language**: Dari (Afghan Persian), Pashtu
- The geography of Afghanistan is arid and mountainous; the **Hindu Kush Mountains** run northeast to southwest and divide the Northern provinces from the rest of the country.

CHINA-PHILIPPINES TUSSLE

Context: **A recent dispute between China and the Philippines over the South China Sea turns the spotlight on tensions in the strategic waters with ramifications to all countries in the Indo-Pacific region, including India.**

- The present dispute revolves around '**Scarborough Shoal'** in the South China Sea.

What is the dispute all about?

- The recent dispute came days after Chinese Coast Guard ships placed a **300-metre-long barrier** to prevent the entry of boats from the Philippines, the latest in long-running tensions in the South China Sea.
- The South China Sea dispute essentially revolves around multiple claims to the land features **— islands and reefs —** and associated territorial waters.
- Under the **UN Convention on the Law of the Sea (UNCLOS),** every state "has the right to establish the breadth of its territorial sea up to a limit not exceeding **12 nautical miles**" and an **Exclusive Economic Zone (EEZ) up to 200 nautical miles** from the territorial sea baseline.

According to the **Asia Maritime Transparency Initiative (AMTI**), as many as 70 disputed reefs and islets are under contestation. The AMTI says **China, Vietnam, the Philippines, Malaysia and Taiwan** have built more than 90 outposts on these disputed features.

What is the significance of Shoal?

- The Scarborough Shoal is named after a British ship that was grounded on the atoll nearly three centuries ago.
- It is one of Asia's most contested maritime features and a flashpoint for diplomatic flare-ups over sovereignty and fishing rights.
- Located in the middle of the South China Sea and near shipping lanes carrying an estimated $3.4 trillion of annual commerce, its position is strategic for Beijing.

The Location:

- **Scarborough Shoal** is located in the **eastern part** of the South China Sea.
- It is uninhabited and shaped like **an atoll** consisting mainly of rocks and barely consists of any land except for very small islands.
- It is located at about **220 kilometers from the Philippines** and is located inside the Exclusive Economic zone of the Philippines.
- Its location is much closer to the Philippines' shore as compared to the China's shore.
- It is also referred to as '**Bajo de Masingloc'** and 'Panatag' by the Philippines and 'Huangyan Island' by China.
- The present name Scarborough was given after an East India company's ship named 'Scarborough' got grounded on one of the rocks in the atoll.

South China Sea and 'Code of Conduct':

- Multiple countries, including **China and ASEAN members**, have disputes over the South China Sea. They've been trying to create a set of rules called **a Code of Conduct (CoC**) to manage these disputes.
- In 2002, **ASEAN and China** agreed on a **Declaration of Conduct (DoC),** which emphasized peaceful dispute resolution according to international law, including the Unied Nations Convention on the Law of the Sea (UNCLOS).
- In 2013, the **Philippines initiated arbitration proceedings against China** under UNCLOS, claiming China's actions violated the convention.
- In 2016, a tribunal ruled against **China's "nine-dash line**," which claimed nearly the entire South China Sea.
- The ruling found China's claims inconsistent with UNCLOS and clarified rules about exclusive economic zones and continental shelves around islands and rocks in the sea.

What are concerns of the region from China?

- China asserts extensive territorial claims in the **South China Sea**, encompassing almost the entire sea, often referred to as the "**nine-dash line**."
- These claims overlap with the claims of several other countries, including **Taiwan, Vietnam, the Philippines, Malaysia, and Brunei.**
- China has undertaken significant military and infrastructure development in the South China Sea, constructing artificial islands and fortifying them with military installations, runways, and missile systems.
- This has raised concerns among neighboring countries and the international community about China's expanding military presence in the region.
- China has been accused of challenging freedom of navigation in the South China Sea by asserting control over certain areas and waters.
- This has led to disputes and tensions with other countries and prompted freedom of navigation operations by the United States and other nations to assert their rights under international law.
- China's actions have sparked concerns about regional stability and the potential for conflict.

Concerns for India 'as dispute continue':

- The South China Sea holds the major **Oil trade route** for countries in the Pacific and India affects if the economy of these counties gets impacted.
- **India's interest in the region:**
  - India is seen as a vital player in the region, and **Southeast Asian countries** are keen to partner with India both economically and strategically.
  - With India's maritime discourse expanding and **55% of India's trade passing** through this region, India must pursue its interest in the region.

What about International Conventions?

- China maintains that, under international law, foreign militaries are not able to conduct intelligence-gathering activities, such as reconnaissance flights, in its exclusive economic zone (EEZ).
- According to the United States, claimant countries, under **UN Convention of the Law of the Sea (UNCLOS),** should have freedom of navigation through EEZs in the sea and are not required to notify claimants of military activities.

'FIVE EYES' INTELLIGENCE ALLIANCE

Context: **The Canadian Prime Minister, Trudeau claimed that Indian government was involved in Khalistani leader's killing on Canadian soil which has now highlighted the 'Five Eyes' alliance.**

Background:

- **Origin of the Alliance:** The U.S.-U.K. intelligence alliance, now known as the **UKUSA Agreement**, traces its origins back to the **Second World War** when the United States and the United Kingdom collaborated to counter the Soviet threat emerging from the Cold War.
- In 1946, the alliance was formalized through an agreement called the **British-U.S. Communication Intelligence Agreement,** commonly referred to as BRUSA.
  - This treaty was signed between the U.**S. State-Army-Navy Communication Intelligence Board** (STANCIB) and the **London Signal Intelligence Board (SIGINT) of Britain.**

- **Over time, the alliance expanded to include other countries**: Canada joined in 1948, while Australia and New Zealand became part of the alliance in 1956, forming a network of countries known as the "Five Eyes" intelligence-sharing alliance.
  - This alliance has continued to operate and cooperate on intelligence matters for decades.

About the 'Five Eyes' alliance:

- The 'Five Eyes' is a multilateral intelligence-sharing network shared by over **20 different agencies** of five English-speaking countries — **Australia, Canada, New Zealand, the United Kingdom and the United States.**
- It is both **surveillance-based and signals intelligence (SIGINT).**
- Intelligence documents shared between the member countries are classified '**Secret—AUS/CAN/NZ/UK/US Eyes Only,**' which gave the group its title 'Five Eyes.'
- **Objective:** The aim of the Five Eyes, however, has shifted following the collapse of the **Soviet Union** and the emergence of new global challenges like **terrorism and the growing influence of China.**

Five Eyes alliance cooperation:

- The Five Eyes have become involved in **ocean and maritime surveillance, scientific and defence intelligence analysis, medical intelligence, geospatial intelligence, counterintelligence, counterterrorism,** and the continuous sharing of intelligence products via a secret collective database known as 'Stone Ghost'.
- The **Five Eyes Intelligence Oversight and Review Council (FIORC)** was created in **September 2016** as the **non-political intelligence oversight, review, and security entities** of the member countries to exchange views on subjects of mutual interest, compare best practices, explore areas of cooperation, and maintain contact with non-Five Eyes countries.

Concerns associated with the Alliance

The Five Eyes intelligence alliance has faced ongoing concerns regarding privacy, security, and its operational methods, which were largely shrouded in secrecy for a long time.

- **Privacy concern among Nationals**: In 2013, former **NSA contractor Edward Snowden** leaked classified documents that exposed a massive surveillance program jointly conducted by the Five Eyes alliance. This program was designed to monitor the citizens of member countries, raising significant privacy and civil liberties concerns.
- The absence of domestic legislation governing intelligence-sharing has raised questions about the legal basis and democratic legitimacy of these arrangements.
- **Lack of 'Third-party rule'**: The "third party rule," often included in intelligence-sharing agreements, prohibits the disclosure of inter-agency information to third parties, undermining the possibility of effective oversight. This lack of transparency has been a source of concern.
- In 2013, a Canadian court rebuked the **Canadian Security Intelligence Service (CSIS)** for using the alliance to monitor the electronic communications of Canadian terror suspects abroad.
  - The ruling highlighted deliberate misinformation provided by **Canadian spy agencies** to expand their surveillance powers unlawfully, potentially **exposing government agents to criminal charges** and putting Canadian terrorism suspects at risk.

India and Impacts:

- **Security Concerns**: India, like other countries, may have concerns about the extent of global surveillance conducted by Five Eyes members.
  - The alliance's mass surveillance programs, as revealed by Edward Snowden, have raised questions about **privacy and civil liberties**, which can influence India's approach to **data protection and cybersecurity.**
- **Global Diplomacy:** The Five Eyes alliance often collaborates on intelligence and security issues on a global scale.
  - India may need to consider the implications of this cooperation in its **own diplomatic and geopolitical strategies,** especially in areas where its interests align or conflict with those of the alliance.
- **Data Sharing**: India's interactions with Five Eyes member countries, particularly the **United States and the United Kingdom,** can be influenced by the alliance's intelligence-sharing arrangements.
  - This may affect bilateral agreements on **data sharing, counterterrorism efforts, and other security-related matters.**

India-US cooperation for data sharing:

- **U.S.-India Cybersecurity Framework Agreement**: The United States and India have been cooperating closely on counterterrorism efforts, and this includes sharing information and intelligence related to terrorist threats and activities.

- Both countries have a shared interest in combating terrorism, and they exchange information to enhance their collective security.
- **Others:** U.S. law enforcement agencies and Indian counterparts collaborate on various law enforcement matters, including sharing information related to **transnational crime, drug trafficking, and organized crime**. This cooperation helps both countries address cross-border criminal activities.

ELEVATING INDIA-TANZANIA RELATIONS: A STRATEGIC PARTNERSHIP UNVEILED

Context: **During Tanzanian President Samia Suluhu Hassan's State Visit to India, the two countries agreed on a five-year defence roadmap and decided to elevate their ties to a "strategic partnership."**

Key-highlights of the Pact

- **Defence:** The two countries have agreed on a five-year roadmap. This roadmap encompasses military training, maritime activities, and the expansion of defence industries.
- **Participation in Indian initiatives:** Tanzania extended its involvement in significant Indian initiatives, notably:
  - International Big Cat Alliance (IBCA)
  - Global Biofuels Alliance (GBA)
- **ITEC:** India has pledged an additional 1,000 **Indian Technical and Economic Cooperation (ITEC)** slots to Tanzania, focusing on key areas such as smart ports, space exploration, biotechnology, and more, spanning a five-year horizon.
- **White shipping information sharing**: The two sides also signed a technical agreement on sharing white shipping information and beginning a cultural exchange program between the two governments for 2023-2027.
- India called Tanzania an important partner in the Indo-Pacific.

Tanzanian President Samia Suluhu Hassan was also conferred with an honorary doctorate by the Jawaharlal Nehru University for fostering stronger India-Tanzania ties.

India-Tanzania Relations:

- Tanzania is **India's largest and closest development** partner in Africa.
- India currently holds the esteemed position of being Tanzania's **third-largest trading partner** and the **fifth-largest investor** in the nation.
- Tanzania has expressed unwavering support for India's aspiration to secure non-permanent membership in the **United Nations Security Council (UNSC)** for the year 2028.

Why Tanzania assumes significance for India?

- **Essential gateway in Africa**: The African nation offers a diverse and robust economy that offers avenues for trade and investment across various sectors, including agriculture, mining, energy, infrastructure, pharmaceuticals, and information technology.

- **Maritime connectivity:** Tanzania's coastline along the Indian Ocean provides crucial maritime connectivity and trade routes.
  - The port of **Dar es Salaam**, the largest port in East Africa, plays a pivotal role in facilitating trade and commerce not only for Tanzania but also for landlocked countries in the region.
- **Important place in policies:** Both are maritime neighbours with a long history of trade and people to people linkages therefore Tanzania has an important place in India's vision of **SAGAR (Security and Growth for all in the Region).**
- **Energy resource**: It has substantial energy resources, including natural gas and renewable energy potential.

Tanzania is the largest country in **East Africa** and includes the islands of **Zanzibar, Pemba, and Mafia.** About twice the size of California, this African country is bordered by the Indian Ocean and eight countries: **Kenya, Uganda, Rwanda, Burundi, Democratic Republic of Congo, Zambia, Malawi, and Mozambique.**

WAR CRIMES LAWS APPLY TO THE ISRAEL-PALESTINIAN CONFLICT

Context: **Internationally accepted rules of armed conflict which have been ratified by all UN member states and supplemented by rulings at international war crimes tribunals is again in light amid tensions between Israel and Palestine.**

Let us see how those rules are applicable for **Israel and Palestine**.

What are War Crimes?

- War crimes are defined as serious violations of humanitarian laws during a conflict.
- The definition, established by the **Rome Statute of the ICC**, is derived from the 1949 Geneva Conventions.
- It is based on the idea that individuals can be held liable for the actions of a state or it's military.
- The taking of **hostages, willful killings, torture or inhuman treatment of prisoners of war**, and forcing children to fight are some of the more obvious examples.

War Crimes vs. Crimes against Humanity:

- The **United Nations Office on Genocide Prevention** and the Responsibility to Protect (or Genocide convention) separates war crimes from genocide and crimes against humanity.
- War crimes are defined as occurring in a **domestic conflict or a war** between two states.
- While genocide and crimes against humanity can happen in peacetime or during the unilateral aggression of a military towards a group of unarmed people.

Applicability of Rules of War Crime:

- A series of treaties governs the **treatment of civilians, soldiers and prisoners of war** in a system collectively known as the "**Law of Armed Conflict**" or "**International Humanitarian Law".**
- It applies to government forces and organised armed groups, including **Hamas militants.**
- Palestinian perpetrators of atrocities in Israel and all alleged perpetrators of crimes on the occupied Palestinian territories would be brought under the **International Criminal Court (ICC)** in The Hague, the only international legal organ able to bring charges.
  - The ICC's founding **Rome Statute** gives it legal authority to investigate alleged crimes on the territory of its members or by their nationals, when domestic authorities are "unwilling or unable" to do so.

Role of International Criminal Court (ICC):

- It is a **permanent judicial body** created by the 1998 **Rome Statute** of the ICC (its founding and governing document), and began functioning on 1st July 2002 when the Statute came into force.
- **Headquarter:** The Hague, Netherlands
- **Members:**
  - 123 nations are **States Parties** to the Rome Statute and **recognise the ICC's authority.**
- The **USA, China, Russia, and India** are not the members.
- The forum was established as a court of last resort to prosecute offences that would otherwise go unpunished, and has jurisdiction over **four main crimes**: genocide, crimes against humanity, war crimes, and the crime of aggression.
- The ICC recognises Palestine as a **member state**, while Israel rejects the court's jurisdiction and does not formally engage with it.

Acts under serious violations of war crimes laws by Israel and Palestine:

- As per the **New York-based Human Rights Watch**; the possible war crimes can be;
  - The deliberate targeting of civilians,
  - Indiscriminate rocket attacks, and
  - The taking of civilians as hostages by Palestinian armed groups, as well as the Israeli counter-strikes in Gaza that killed hundreds of Palestinians.

Geneva Conventions (1949):

- The **Geneva Conventions (1949)** and their Additional Protocols are international treaties that contain the most important rules limiting the barbarity of war.
- They protect people who do not take part in the fighting (civilians, medics, aid workers) and those who can no longer fight (wounded, sick and shipwrecked troops, prisoners of war).
  - The **first Geneva Convention** protects wounded and sick soldiers on land during war.
  - The **second Geneva Convention** protects wounded, sick and shipwrecked military personnel at sea during war.

- The **third Geneva Convention** applies to prisoners of war.
- The **fourth Geneva Convention** affords protection to civilians, including in occupied territory.

- India is a party to the **Geneva Convention**.

BRI: AN OVERVIEW

Context: Recently, the Third and Road Forum for International Co-operation being convened in China.

What is Belt and Road Initiative (BRI)?

- The BRI is an ambitious plan to develop two new trade routes connecting China with the rest of the world. But the initiative is about far more than infrastructure.
- Often termed as China's Marshall Plan, it is an effort to develop an expanded, interdependent market for China, grow China's economic and political power, and create the right conditions for China to build a high technology economy.

Why create the Belt and Road?

- **There are three main motivations for the BRI:**
  - The first, and most discussed internationally, is China's rivalry with the US. The vast majority of Chinese international trade passes by sea through the Malacca strait off the coast of Singapore which is a major US ally.

The initiative is integral to China's efforts to create its own more secure trade routes.

  - China's intention is also to make participating nations interdependent with the Chinese economy, and thereby build economic and political influence for China.

BRI has similarities with the Marshall Plan that followed the Second World War – but with the essential difference that China dispenses funding to other nations based purely on shared economic interests.

- The second key reason for the initiative is the legacy of the 2008 financial crisis. China's government responded to the emergency with a stimulus package, issuing contracts to build railways, bridges, and airports, but saturated the Chinese market in the process. The Belt and Road framework provides an alternative market for China's vast state-owned companies beyond the borders of China.
- Finally, the Belt and Road is seen as a crucial element in the Chinese government's efforts to stimulate economies of the country's central provinces, which historically lag behind richer coastal areas. The government uses the Belt and Road to encourage and support businesses in these central regions, allocating budget generously, and encouraging businesses to compete for Belt and Road contracts.

Why is it called the 'Belt and Road' initiative?

- The Belt and Road Initiative is a relatively new name. Initially it was referred to as two separate projects, then as the 'One Belt, One Road' initiative, then finally as the Belt and Road Initiative.

The BRI comprises two main components:

The Silk Road Economic Belt and the **21st century Maritime Silk Road**: The Silk Road Economic Belt focuses on improving connectivity and cooperation between China and countries in Central Asia, Europe, and West Asia, while the 21st century **Maritime Silk Road** focuses on strengthening maritime cooperation between China and countries in Southeast Asia, South Asia, and Africa

- **The Belt:**
  - The **Silk Road Economic** 'Belt' element refers to plans for a revitalized series of ancient overland trading routes connecting Europe and Asia to be built largely with Chinese expertise.
  - The idea was first proposed by Chinese president Xi Jinping during a visit to Kazakhstan in 2013, and central Asia is seen as the most vital region for the 'Belt' element.
- **The Road:**
  - In 2014 Xi Jinping outlined plans to additionally establish new sea trade infrastructure along the old Marco Polo route – a maritime silk road connecting China, Southeast Asia, Africa, and Europe.
  - This would be a longer route avoiding the Malacca Strait, incorporating fuelling stations, ports, bridges, industry, and infrastructure through Southeast Asia and into the Indian Ocean.
  - Pakistan is seen as perhaps the most crucial partner country in this effort through the China Pakistan Economic Corridor project.

Who is funding the Belt and Road Initiative?

- The Chinese state is the underwriter for the initiative, via its four state-owned banks lending to state owned enterprises. Other governments have criticized the Belt and Road for the lack of private sector participation.
- There is, though, a little enthusiasm for the initiative from even the Chinese private sector due to the lack of return on investment.

Challenges related to BRI:

- **Debt-Trap Challenge-**
  - One of the most significant criticisms of the BRI is that it is a debt trap, which involves China lending money to developing countries for infrastructure projects that they cannot afford to repay.
  - Critics argue that this leads to countries becoming trapped in a cycle of debt and dependence on China, which can undermine their sovereignty and increase their vulnerability to economic and political pressure from China.

Examples of countries that have **experienced debt issues** as a result of BRI projects:

- Sri Lanka, for example, was unable to repay its debt for the Hambantota Port project and was forced to hand over control of the port to China on a 99-year lease.
- Djibouti's struggle to repay Chinese loans has also generated criticism on the Chinese model of project financing for creating debt traps for developing countries.
- Pakistan's debt to China has also been growing, with concerns raised about the financial sustainability of the projects and their impact on Pakistan's economy with China investing billions of dollars in infrastructure projects under the China-Pakistan Economic Corridor (CPEC), a key component of the BRI.
- China has invested heavily in infrastructure projects in Laos, however, the project has been criticised for its high cost and potential impact on the environment, and concerns have been raised about Laos' ability to repay the loans from China. These are just a few of many such cases.

- **Political Issues:**
  - Geopolitical rivalries and disputes, such as the India-China border dispute, have affected the implementation of BRI projects in certain regions.
  - These political tensions can undermine the initiative's progress.
- **Environmental and Social Challenges:**
  - Infrastructure development projects under the BRI have faced criticism for their potential environmental and social impacts. Ensuring that BRI projects are environmentally sustainable and consider the well-being of local communities is a challenge.
- **Geostrategic Concerns**:
  - The BRI has raised geopolitical concerns, particularly regarding China's growing influence and control over critical infrastructure in partner countries. These concerns have led some countries to reevaluate their participation in the initiative.

India's Concerns wrt BRI:

- India is of the opinion that the inclusion of the so-called CPEC which passes through parts of the **Indian state of Jammu & Kashmir under illegal occupation of**

Pakistan as a flagship project of BRI, **reflects lack of appreciation of India's concerns on the issue of sovereignty and territorial integrity.**

- The Indian Government firmly believes that connectivity initiatives must be based on the **universally recognized international norms**, good governance, rule of law, openness, transparency, and equality, and must be **pursued in a manner that respects sovereignty and territorial integrity.**

Outcomes of the BRI Forum for International Co-operation:

- The Chinese President brushed aside criticisms and reiterated his commitment to the initiative.
- Xi also proposed an eight-part action plan on the Belt and Road initiative, including the full removal of restrictions on foreign investment in Chinese manufacturing and an initiative on global artificial intelligence governance.
- BRI was spoken of being the engine that will fuel the growth of third world countries in the coming years.

INDIA AGEING REPORT 2023

Context: Recently, India Ageing Report 2023 has been released by the United Nations Population Fund and International Institute for Population Sciences.

Highlights of the Report:

- The report highlighted that the awareness among the elderly population regarding the social welfare schemes in the country remains very low.
- India as the country's elderly is likely to make up **20%** of the country's **population by 2050**.
- **Categorisation:**
  - A little **more than half of the elderly (55%)** are aware of the **old-age pension scheme (IGNOAPS),** around 44% about the **widow pension scheme (IGNWPS);** and 12% about the **Annapurna Scheme.**
- Also, in comparison to the awareness of social security schemes, the awareness of **MWPSC (Maintenance and Welfare of Parents and Senior Citizens) Act** is relatively very low.
- A little less than **12% of elderly people** had any knowledge regarding the MWPSC Act - only **15% of elderly men** and **9% of elderly women** knew about the Act.
- **Low utilisation of welfare schemes**:
  - **For old-age people**: About a third of the rural elderly (30%) from **below-poverty-line (BPL) households** receive benefits from IGNOAPS.
  - **For Widows**: Amongst the elderly BPL widows, only 24% receive the widow pension.
  - **Food security**: The utilisation of Annapurna scheme is substantially low across all sections of the elderly.
- **State-wise data:**
  - **Among Southern states**: Only Karnataka showed a somewhat higher coverage (48.2%) while a third of the BPL elderly availed this scheme in **Andhra Pradesh and Kerala**.
  - Only a fourth of the ageing population from BPL households received IGNOAPS benefits in Telangana.
  - The **highest coverage of welfare schemes** was found in Andhra Pradesh wherein 51% of the widowed elderly received pension,
  - It was followed by **Himachal Pradesh and Telangana** with around 41% coverage.
- **Older persons with disabilities**:
  - Of the total elderly population, around **2.5% have hearing impairment** and **3.7% have vision impairment.**
  - According to the report around 32% of the elderly with **hearing and vision impairments** availed the social insurance scheme.
  - **The widowed elderly with disabilities:** The widow pension scheme was utilized by those with physical impairment (17.6%), mental impairment (16.1%), hearing impairment (23.1%) and vision impairment (24%).
  - **State-wise utilization of disability schemes:**
    - Rajasthan, Bihar, Karnataka and Madhya Pradesh showed higher access to IGNOAPS.
    - Maharashtra, Gujarat, Uttar Pradesh and Kerala are some of the States with lower access to the **old age pension scheme.**

Why elderly population is vulnerable?

- **Social factors responsible**:
  - Negligence by kids towards their old parents.
  - Disillusionment due to retirement.
  - Feeling of powerlessness, loneliness, uselessness and isolation in elderly.
  - Generational gap.
- **Financial:**
  - Retirement and dependence of elderly on their child for basic necessity.
  - Sudden increase in out of pocket expenses on treatment.

- Migration of young working-age persons from rural areas has negative impacts on the elderly, living alone or with only the spouse, usually poverty and distress.
- Insufficient housing facility.
- A national survey carried out by the **NGO HelpAge India** has shown that as many as 47% of elderly people are economically dependent on their families for income and 34% are relied on pensions and cash transfers, while 40% of the surveyed people have expressed the desire to work "as long as possible".

◈ **Health:**

- Health issues like **blindness, locomotor disabilities and deafness** are most prevalent.
- Mental illness arising from **senility** (showing poor mental ability because of old age) **and neurosis**.
- Absence of **geriatric care facilities** at hospitals in rural areas.

Government Initiatives for Elderly in India

◈ **Pradhan Mantri Vaya Vandana Yojana (PMVVY):** It is a Pension Scheme announced by the Government of India exclusively for the senior citizens aged 60 years and above. The scheme is now extended up to 2023 for a further period of three years beyond 2020.

◈ **Integrated Program for Older Persons (IPOP):** The main goal of this policy is to improve the quality of life of senior citizens. This is done by providing them with various basic amenities such as food, shelter, medical care, and even entertainment opportunities.

◈ **Rashtriya Vayoshree Yojana**: It is a central sector scheme funded from the Senior Citizens' Welfare Fund. The fund was notified in the year 2016. All unclaimed amounts from small savings accounts, PPF and EPF are transferred to this fund.

- It aims to provide aids and assistive living devices to senior citizens belonging to Below Poverty Line (BPL) category who suffer from age-related disabilities such as low vision, hearing impairment, loss of teeth and locomotor disabilities.

◈ **SAMPANN Project:** It was launched in 2018. It is a seamless online pension processing and payment system for **Department of Telecommunications** pensioners. It provides direct credit of pension into the bank accounts of pensioners.

◈ **SACRED Portal for Elderly**: The portal was developed by the Ministry of Social Justice and Empowerment. Citizens above **60 years of age** can register on the portal and find jobs and work opportunities.

Issues associated with schemes

◈ **Chances of Exclusion**:

- Eligibility for NSAP is restricted to "Below Poverty Line" (BPL) families, based on outdated and unreliable BPL lists; some of them are 20 years old.
- When it comes to old-age pensions, targeting is not a good idea in any case as there are huge exclusion errors in the BPL lists.
- For one thing, targeting tends to be based on household rather than individual indicators.
- A widow or elderly person, however, may experience major deprivations even in a relatively well-off household.

◈ **Complicated Formalities**:

- Targeting tends to involve complicated formalities such as the submission of BPL certificates and other documents, which has certainly been the experience with NSAP pensions.
- The formalities can be particularly forbidding for elderly persons with low incomes or little education, who are in greatest need of a pension.
- Moreover, even when lists of left-out, likely-eligible persons were submitted to the local administration, very few were approved for a pension, confirming that they face resilient barriers in the current scheme.

◈ **Stagnant Contribution**:

- The central contribution to old-age pensions under NSAP has stagnated at a tiny Rs. 200 per month since 2006, with a slightly higher but still paltry amount (Rs. 300 per month) for windows.
- On the other hand, many States have enhanced the coverage and/or amount of social-security pensions beyond NSAP norms using their own funds and schemes.
- Some have even achieved "near-universal" (about 75%-80%) coverage of widows and elderly persons.

SUPREME COURT GAVE A SPLIT VERDICT ON PLEA TO 'RECALL TERMINATION OF 26-WEEK PREGNANCY'

Context: **The Supreme Court bench, while hearing the recall application filed by the Union government against the Court's order allowing medical termination of a 26-week pregnancy of a married woman, referred the matter to a larger bench.**

About the case:

- On October 9, the Bench of **Justices Kohli** and **Nagarathna** had, after getting a report from an **All India Institute of Medical Sciences (AIIMS) medical board,** allowed the medical termination of the woman's pregnancy in accordance with her wish.
- However, the Union government returned to the apex court with an application.
- The application said that one of the expert doctors on the medical board had emailed Ms. Bhati on October 10 against the abortion, saying the child should be **given a chance to survive.**

Government's Argument:

- Additional Solicitor General Aishwarya Bhati, for the Union government, mentioned that the woman has no "**absolute right of autonomy to exercise her reproductive rights in a way that would take away the rights of her unborn child".**
- Referring to the **Medical Termination of Pregnancy (Amendment) Act of 2021**, which extended the deadline for abortion in "exceptional circumstances" to 24 weeks.
  - These exceptional circumstances allowed medical termination only if it was necessary to save the **life of the mother** or in case of a **fatal deformity** detected in the foetus.
- Once there is a viable baby, the relief **cannot be one-sided**.
- Unless she wants to keep the child, her right to bodily autonomy or integrity cannot be beyond the Act. Mother's fundamental right to choice can be **curtailed by the Parliament**.

Supreme Court's Split Verdict:

- **Perspective 1: Justice Kohli**, in her opinion, agreed with the government that woman should **not be permitted to terminate the pregnancy.**
  - The court also asked the woman if she would be willing to foster the **unborn child** till the government could arrange for its adoption.
- **Perspective 2:** However, **Justice Nagarathna** disagreed saying the woman's decision ought to be respected, considering mother's **socio-economic** grounds.

What are women's reproductive rights?

Based on the multiple definitions of reproductive rights, it can be said that they include some or all of the following rights:

- Right to safe and legal abortion.
- Right to control one's reproductive functions.
- Right to access in order to make reproductive choices free of coercion, discrimination and violence.
- Right to access education about contraception and sexually transmitted diseases and freedom from coerced sterilization and contraception.
- Right to protection from gender-based practices such as female genital cutting and male genital mutilation.

MTP Amendment Act, 2021

- In 2021, Parliament amended the law to allow for abortions based on the advice of one doctor for pregnancies up to 20 weeks.
- The modified law needs the opinion of two doctors for pregnancies between 20 and 24 weeks.
- Further, for pregnancies between 20 and 24 weeks, rules specified seven categories of women who would be eligible for seeking termination under Section 3B of rules prescribed under the MTP Act;
  - Survivors of sexual assault or rape or incest,
  - Minors,
  - Change of marital status during the on-going pregnancy (widowhood and divorce),
  - Women with physical disabilities (major disability as per criteria laid down under the Rights of Persons with Disabilities Act, 2016)
  - Mentally ill women including mental retardation,
  - The foetal malformation that has a substantial risk of being incompatible with life or if the child is born it may suffer from such physical or mental abnormalities to be seriously handicapped, and
  - Women with pregnancy in humanitarian settings or disasters or emergencies may be declared by the Government.

Arguments in favour of bodily rights	Argument against bodily rights
• A female is considered a moral person that is entitled to rights, including the right to life. ➤ So, abortion is deemed acceptable as the foetus is not a person. ➤ A list of criteria of personhood is identified, which includes consciousness, reasoning, activity, communication and self-awareness. A foetus undeniably is incapable of fulfilling these criteria. • The mother, who is a person, has a right to life and it supersedes the **rights of the foetus** to choose whether or not it remains connected to her body. • Also, pregnancy is assumed to be a foreseeable consequence of heterosexual intercourse, that too when there is no intention to '**have a baby**'. So, denying her the right to abort the child when she was not planning for it is unwarranted.	• 'Future like ours' argument: Abortion is wrong because it deprives the foetus of a potential 'future like ours'. ➤ It suggests that death is a bad thing because it deprives people of all the experiences, enjoyments, opportunities that would make up their future personal life. • **Moral conduct**: Killing an innocent human being is a moral wrong. Those who are against abortions believe that human life begins at conception, and by drawing the same analogy, the foetus is an innocent human being. • So, killing the foetus is wrong and abortion is always wrong.

M.S. SWAMINATHAN (1925-2023): FATHER OF 'GREEN REVOLUTION'

Context: **Mankombu Sambasivan Swaminathan, widely recognized as M.S. Swaminathan, the renowned agricultural scientist and a pivotal figure in India's 'Green Revolution,' has peacefully passed away at the age of 98, due to age-related ailments.**

Who was M.S. Swaminathan (1925-2023)?

◈ Mankombu Sambasivan Swaminathan (M.S. Swaminathan), is known as the Father of Green Revolution in India.

◈ Born in Kumbakonam on August 7, 1925 to M.K. Sambasivan, a surgeon, and Parvati Thangammal, Swaminathan had his schooling there.

◈ His keen interest in agricultural science coupled with his father's participation in the freedom movement and Mahatma Gandhi's influence inspired him to pursue higher studies in the subject.

◈ **Education:**

➤ He got two undergraduate degrees, including one from the Agricultural College, Coimbatore (now, Tamil Nadu Agricultural University).

➤ He obtained a postgraduate degree in cytogenetics in 1949 from the Indian Agricultural Research Institute (IARI), New Delhi.

➤ He earned a Doctor of Philosophy degree from the Cambridge.

➤ He did his post-doctoral research at the University of Wisconsin.

◈ **Important Positions held by M.S. Swaminathan:**

➤ In 1954, Dr. Swaminathan joined the Central Rice Research Institute (CRRI), Cuttack and later, IARI.

➤ In 1966, he became IARI Director, the post he held till 1972.

➤ He became Director General of the Indian Council of Agricultural Research (ICAR).

➤ In 1979, he was made the Principal Secretary, Union Ministry of Agriculture and Irrigation.

➤ In 1980, he was appointed Member (Agriculture, Rural Development, Science and Education), Union Planning Commission, and, for a few months, he served as the Deputy Chairman of the body.

➤ Dr. Swaminathan was a nominated member of the Rajya Sabha from 2007 to 2013.

Swaminathan Commission

- In 2004, the Union government made **Dr. Swaminathan** chairman of the **National Commission on Farmers**.
- The panel submitted five reports in two years to the Centre. Its main recommendation was that minimum support price should be at least 50% more than the weighted average cost of production.

◈ **Awards & Recognition:** Dr. Swaminathan was a recipient of the **Padma Shri** in 1967. He was chosen for the **Ramon Magsaysay award** for community leadership in 1971. He was awarded the **Padma Bhushan** in January 1972.

- In 1987, he became the first to get the **World Food Prize** and the first foreigner to receive the **Golden Heart Presidential Award of Philippines.**
- The first **World Agriculture Prize**, instituted by the **Indian Council of Food and Agriculture**, was given to him in October 2018.

M S Swaminathan Research Foundation (MSSRF)

- In 1988, he established a not-for-profit trust — MSSRF — with the proceeds he got from the Food Prize.
- The Foundation, which began functioning in Chennai since 1989, aims to accelerate use of modern science and technology for agricultural and rural development to improve lives and livelihoods of communities.

What is the role of Dr. Swaminathan in Green Revolution?

- **Background:** In 1960s, India was on the verge of a mass famine.
- Green Revolution turned the northern states of Punjab and Haryana into breadbasket for wheat and rice production, helping low-income farmers.
- **Dr. Swaminathan** worked closely with two Union Agriculture Ministers, C. Subramaniam (1964-67) and Jagjivan Ram (1967-70 & 1974-77) for the success of the **'Green Revolution'.**
- Swaminathan along with **Norman Bolaug** and other scientists developed **high-yielding varieties (HYV)** of wheat and later, promoted sustainable development which he called, the 'evergreen revolution'.
- Green Revolution paved the way for quantum jump in productivity and production of wheat and rice through adaptation of chemical-biological technology.

Important Revolutions	
White Revolution (Operation Flood, 1970s-1990s)	• **Father of Revolution:** Dr. Verghese Kurien • **Period:** 1970-1996
Grey Revolution (Wood Production/ Fertilisers)	• **Father of Revolution:** M.S. Swaminathan • **Period:** 1960-70
Blue Revolution (Fish Production)	• **Father of Revolution:** Dr. Arun Krishnan • **Period:** 1973-2022
Golden Revolution (Jute Production)	• **Father of Revolution:** Nirpakh Tutaj • **Period:** 1990s
Pink Revolution (Onion Production)	• **Father of Revolution:** Durgesh Patel • **Period:** 1970s

What are high-yielding varieties of crops?

- High-yielding varieties of crops (HYVs), produced a **higher yield of crop** per hectare in comparison to traditional variants.
- These variants are produced using a combination of **traditional breeding steps and biotechnology**, which includes **genetic diversity.**
- The resulting HYVs are usually **disease-resistant** and have a **higher tolerance** to conditions like **drought.**
- **IR8**, a variety of rice developed by the **International Rice Research Institute (IRRI)** that could produce as much as seven tonnes of rice per hectare compared to traditional seeds that could produce only two tonnes per hectare, was one of the main HYVs grown during the Green Revolution.
- This **"miracle rice"** was first introduced in the Philippines and was produced by crossing a tall high-yielding strain from Indonesia called **Peta** with a sturdy dwarf variety from **China** called **Dee-Geo-woo-gen.**
- Other HYVs grown during the **Green Revolution** in India included **Kalyan Sona and Sonalika** varieties of wheat which were considered to be of good **"chapati-making"** quality and had a **"amber grains and good yield potential"** (few varieties of Mexican dwarf wheat which were procured earlier were rejected because of their red colour).

Important Scientific Terms	
Yield gap	• The difference between the potential or maximum achievable yield of a crop and the actual realised yield for a given area is called the yield gap. During the Green Revolution, one of the main areas of focus was the increase productivity from existing farmlands using HYVs in order to tackle the threat of famine.
Cytogenetics	• It is the study of **chromosomes (DNA-carrying structures)** and how they related to hereditary characteristics and traits. • **Application:** Identifying traits such as **resistance to diseases, drought, and pests in crops**

Hexaploid wheat (Triticum aestivum)	• Hexaploid wheat contains six sets of chromosomes and is among the most widely cultivated cereal crops across the world. • It is also called "bread wheat". • Dr. Swaminathan is associated with research on the cytogenetics of hexaploid wheat.
Carbon fixation	• It is the process by which **crops capture carbon dioxide** from the atmosphere and convert it into organic compounds like sugars and starches, mostly through photosynthesis. • Grass species either use **C3 or C4** classes of photosynthetic pathway for carbon fixation. • The C3 pathway, also called the **Calvin cycle**, is slower in comparison to C4 – also called the **Hatch and Slack pathway.** • C3 cycle of fixation occurs when the tiny pores of surface of leaves (in the mesophyll cells) are open, while C4 occurs in both mesophyll cells and bundle sheath cells (that surround the veins of the plant), making photosynthesis more efficient.

How Green Revolution transformed India?

Before Green Revolution

- At independence, India had only 15% area under irrigation and the rest was rain-fed.
- Chemical fertilisers were hardly used as there was no manufacturing in the country and foreign exchange was so scarce that import of fertilisers was not considered prudent.
- The food grains investigation commission (1949) argued for better seeds, chemical fertilisers and investment in irrigation. These were later to become the building blocks of green revolution.

After Green Revolution

- Green revolution made India a food secure nation. It led to high productivity of crops through adapted measures, such as:
  - increased area under farming
  - double-cropping, which includes planting two crops rather than one, annually
  - adoption of HYV of seeds
  - highly increased use of inorganic fertilizers and pesticides
  - improved irrigation facilities
  - improved farm implements and crop protection measures
- The success of India's green revolution proved that **science, coupled with good policy, efficient bureaucracy, support of political bosses and co-operative federalism** in real sense could defeat the Malthusian predictions of hunger and famine.

The side effects of the Green Revolution

- Despite its landmark role in achieving food sufficient in India, the Green Revolution has been criticised on multiple counts, such as benefiting the already prosperous farmers as it was introduced in states with higher productivity.

Mankombu Sambasivan Swaminathan's life and contributions serve as a profound testament to his unwavering dedication to enhancing agriculture, guaranteeing food security, and leaving a lasting imprint on the welfare of individuals in India and globally. His enduring and impactful legacy as a scientist, agricultural visionary, and compassionate advocate continues to resonate.

INDIA'S FIRST REGIONAL RAPID TRANSIT SYSTEM (RRTS) INAUGURATED

Context: Recently, the Prime Minister inaugurated the first leg of the Regional Rapid Transit System (RRTS), India's first mass rapid system dedicated to regional connectivity.

- Trains on the first section will eventually cut the journey time between **Delhi and Meerut** to less than an hour.

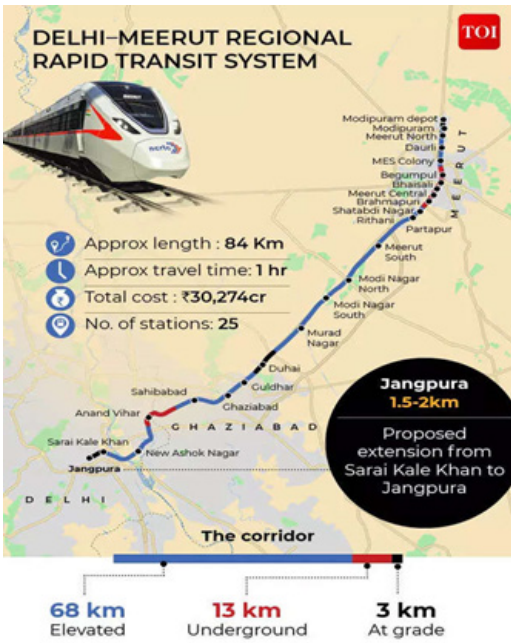
About:

- India's first regional rapid train, between **Delhi and Meerut,** has been named "**Namo Bharat**".
- **The events held:** The projects which got the green signal includes;
  - inaugurate the priority section of the Delhi-Ghaziabad-Meerut Regional Rapid Transit System (RRTS) corridor and
  - Flag off the "**RapidX train**" connecting **Sahibabad and Duhai Depot**.
- Construction:
  - The **National Capital Region Transport Corporation (NCRTC)** has constructed the RRTS also known as **Namo Bharat**.

- NCRTC is a joint venture company of the Central government and the governments of **Delhi, Haryana, Rajasthan and Uttar Pradesh.**
- NCRTC, under the **Ministry of Housing and Urban Affairs**, is mandated with implementing the RRTS project across the National Capital Region.

The Regional Rapid Transit System (RRTS):

- With semi high-speed rail connectivity at its core, the RRTS is an integrated, mass transit network.
- It aims to ensure balanced and sustainable urban development through better connectivity and access across the NCR.



Origin

- The idea of such a network lies in a study which the **Indian Railways** was commissioned to carry out in the year **1998-99**.
- The study identified the possibility of an RRTS network to connect various locations in the NCR through fast commuter trains.
- The proposal was re-examined in the year 2006 with the extension of the **Delhi Metro lines** to some NCR towns such as **Gurgaon, Noida and Ghaziabad.**
- It was soon taken up by the National Capital Region Planning Board (NCRPB) while developing its Functional Plan on Transport for NCR-2032.
- NCRPB identified and recommended eight RRTS corridors to connect NCR towns with high speed rail-based commuter transit services.

Objective

- It seeks to unlock the entire potential of the NCR in various ways in addition to enhancing multi-modal connectivity at the existing transportation hubs.
- One of the most significant aims of the project is to nudge commuters towards public transportation.
- Hence, it will have a positive impact on relieving the congestion both on its road/highways as well as existing metro and railway networks.
- The project aims to give a push to employment generation and the opening up of newer commercial hubs along the current contours of the NCR.
- Shorter travel times are expected to increase the overall economic productivity of the region.

Features

- RRTS trains will travel significantly **faster than metro trains.**
- These will operate at a speed of **160 km/hour** but are designed to be able to run at **speeds up to 180 km/hour.**
- The RRTS is modelled on systems such as the **RER in Paris, Regional-Express trains in Germany and Austria as well as the SEPTA Regional Rail in the United States,** among others.

How is the RRTS different from existing metro or railways systems?

- When compared with metros, the RRTS network is faster.
- Compared with the Indian Railways, though the RRTS train will cover relatively smaller distances. It will do so at higher frequency and provide relatively more comfort than the average Railways coach.

Role of Science and Technology in Economic Growth:

In economics, it is widely accepted that technology is the key driver of the economic growth of countries, regions and cities. Technological progress allows for the more efficient production of more and better goods and services, which is what prosperity depends on.

- **Time is Money**: Technology can save the time it takes to produce a good or deliver a service, contributing to the overall profits of a business.
- **Efficiency**: Technology can contribute to the efficiency of a business's output rate, allowing for larger quantities of products to be moved or of services to be rendered.
- **Specialization:** Technology has to lead to an increase in the division of labour and specialization of jobs within a business, further contributing to the efficiency with which a business can run.

- **Natural Resources**: Technology has a huge effect on the ability of businesses and governments to access natural resources and use them in the most effective ways possible to benefit both the business and the economy.
- **Industrial Expansion**: Thanks to the increased efficiency of labour with the ever-improving state of technology, businesses can increase total output, which in turn leads to higher profits and greater economic development.
- **Research:** Better technology has led to further research into nearly every sector of business and science, meaning businesses can benefit from all sorts of technological advancements.
- **The Internet and International Trade**: Information technology is the single most important element in the success and growth of international trade and job market growth, allowing businesses to share information and conduct trade in less time than the blink of an eye.

Benefits	Consequences
• **Improved Connectivity:** Railways enhance accessibility, linking remote areas to urban centers, promoting inclusivity and reducing regional disparities. • **Reduced Traffic Congestion**: Efficient rail networks reduce the dependency on road transportation, mitigating traffic congestion and lowering pollution levels. • **Job Creation**: The construction and operation of railways generate employment opportunities, both directly and indirectly, in various sectors such as construction, maintenance, and services. • **Development of Industrial Corridors**: Railways can serve as the backbone of industrial corridors, promoting the development of industries along their routes.	• **Land Displacement and Disruptions**: Railway expansion may necessitate land acquisition and potentially disrupt local communities, leading to social and environmental challenges. • **Maintenance and Operating Costs**: The upkeep and operation of railway networks require significant financial investment, which can be a burden on public budgets. • **Environmental Impact during Construction**: Construction activities can disrupt natural habitats, leading to soil erosion, habitat loss, and disturbances to local flora and fauna.

Conclusion

In conclusion, the expansion of railway infrastructure brings about a range of consequences, both positive and negative. While railways significantly improve accessibility, reduce traffic congestion, and contribute to environmental sustainability, they also pose challenges like land displacement, environmental disruptions, and potential safety concerns. Striking a balance between reaping the economic and societal benefits and addressing the associated drawbacks requires meticulous planning, community engagement, and a commitment to sustainable development.

GLOBAL TAX EVASION REPORT 2024

Context: **The European Union Tax Observatory in its 'Global Tax Evasion Report 2024' has called for a global minimum tax on billionaires equal to 2% of their wealth.**

About the report –

The European Union Tax Observatory has released **'Global Tax Evasion Report 2024'**, which mentioned that:

- Tax evasion is enabling billionaires to enjoy effective tax rates equivalent to **0% to 0.5%** of their wealth
- Global minimum tax on billionaires equal to **2% of their wealth**.
  - The report argues that a 2% tax on billionaires is reasonable, considering that their wealth has grown at an average annual rate of **7% since 1995**, while their effective tax rates often remain as low as 0% to 0.5%.
- **Impact of international efforts-**
  - The success of automatic exchange of bank information — in reducing offshore tax evasion by a factor of three over the **past 10 years**.
  - There is still the equivalent of 10% of world GDP in offshore household financial wealth, but only 25% of it evades taxation.
- Reasons identified by the report for continuation of Tax evasion –
  - Possibility of owning financial assets that escape being reported on because not all offshore financial institutions comply with the requirement of automatic exchange of bank information.
  - Wealthy individuals who used to hide **financial assets** in offshore banks have started shifting their holdings to asset classes not covered under this agreement, for e.g. – **Real Estate.**
  - The **global minimum tax of 15%** for multinational corporations (MNCs), adopted in 2012, has been undermined by a growing list of loopholes.

- Some MNCs use **'green' tax credits** for low carbon transition to reduce their tax rates below the minimum.

- **Emerging Tax Competition:** The report highlights the rise of preferential tax regimes in the EU and the UK, targeting wealthy foreign individuals.
  - These regimes offer tax exemptions or reductions to incoming residents but weaken overall tax collection and have negative spill over effects on other countries.
- **Recommendations:**
  - Minimum corporate tax of 25% and remove the loopholes that foster tax competition Introduce a new global minimum tax for billionaires equal to 2% of their wealth.
  - Move towards the creation of a Global Asset Registry (International register of all wealth and assets).
  - Institute mechanisms to tax wealthy people who have been long-term residents in a country and choose to move to a low tax country.

What is Tax Evasion?

- Tax evasion is the illegal act of deliberately and knowingly **underreporting, concealing, or misrepresenting** information on a tax return to **reduce tax liability**.
  - It involves activities such as hiding income, inflating deductions, or using offshore accounts to avoid paying the taxes owed to the government.
  - It is distinguished from tax avoidance, which is the legal practice of minimizing tax liability through legitimate means such as deductions and tax credits.

Effect of Tax evasion on Global Economy:

- **Reduced Government Revenue:** Tax evasion results in governments collecting less revenue than they are entitled to. This reduction in revenue can lead to budget deficits and limit the government's ability to fund essential public services such as healthcare, education, and infrastructure development.
- **Inequitable Tax Burden**: When individuals or businesses engage in tax evasion, the burden of funding government services falls disproportionately on law-abiding taxpayers. This can lead to a sense of unfairness and erode public trust in the tax system.
- **Weakened Social Safety Nets**: Lower tax revenues can force governments to reduce spending on social safety net programs like welfare, unemployment benefits, and healthcare. This can negatively impact vulnerable populations and increase income inequality.
- **Reduced Economic Development**: Tax evasion can hinder economic development by limiting the government's ability to invest in infrastructure and public services, which are essential for fostering economic growth.
- **Capital Flight**: Tax evasion often involves the use of offshore accounts and tax havens. This capital flight can drain resources from the domestic economy, limit investment opportunities, and reduce economic stability.
- **Global Economic Imbalances**: Tax evasion can exacerbate global economic imbalances by diverting funds away from countries where taxes are evaded and toward tax havens. This can distort trade balances and hinder cooperation in addressing global economic challenges.

Key International Initiatives and Measures:

- **Common Reporting Standards (CRS):** The CRS is an international framework developed by the **Organisation for Economic Co-operation and Development (OECD)** to facilitate the automatic exchange of financial information between tax authorities. It requires financial institutions to report account information of foreign taxpayers to their respective tax authorities, which is then shared with the taxpayer's home country.

Steps taken by India to curb tax evasion:

- Income-tax Act, 1961 (Search and Seizure);
- Treaties such as Double Tax Avoidance Agreement (DTAA),
- Tax Information Exchange Agreement (TIEA),
- The Benami Transactions Informants Reward Scheme.
- Reduced base corporate tax for existing companies to 22 percent and new manufacturing firms to 15 percent.

- **FATCA (Foreign Account Tax Compliance Act):** Enacted by the United States, FATCA requires foreign financial institutions to report information about U.S. account holders to the Internal Revenue Service (IRS). Many countries have entered into intergovernmental agreements with the U.S. to implement FATCA's requirements.
- **Base Erosion and Profit Shifting (BEPS):** The OECD's BEPS project addresses tax planning strategies used by multinational corporations to shift profits to low-tax jurisdictions. BEPS recommendations aim to close tax loopholes, prevent double taxation, and ensure that profits are taxed where economic activities occur.

- **Double Taxation Treaties**: Many countries have **double taxation treaties (DTTs)** in place to prevent double taxation and promote international cooperation. DTTs often include provisions for the exchange of tax information between countries.
- **Tax Information Exchange Agreements (TIEAs):** TIEAs are bilateral agreements that facilitate the exchange of information on tax matters between countries. These agreements are crucial for addressing tax evasion and promoting transparency.

RBI SETS UP WORKING GROUP ON FRAMEWORK FOR EXPECTED CREDIT LOSS (ECL) PROVISIONS

Context: **As per the press release by the Reserve Bank of India (RBI), it announced to form a working group for recommendations on provisioning by banks based on the Expected credit loss (ECL) framework.**

What is Expected credit loss (ECL) based provisioning?

- ECL provisioning refers to the practice followed by **banks and financial institutions** to set aside a portion of their earnings as a provision to **cover potential losses** arising from non-performing assets (NPAs).

About the announcement:

- The **nine-member working group** will be formed, chaired by R. Narayanaswamy, former faculty at IIM Bangalore.
- The **terms of reference** for the working group, as detailed by the RBI, are as follows:
  - Elaborate on the principles that must be considered by banks while designing the credit risk models to be used for assessing and measuring expected credit losses.
  - Recommend factors that banks should consider for determining credit risk.
  - Suggest the methodology to be used for undertaking external, independent validation of the models.
  - Recommend, based on comprehensive data analysis, prudential floors for provisioning.
- All scheduled commercial banks, except **regional rural banks**, are considered to be brought under the ECL provisioning framework.
- If the **risk of default rises,** banks will be required to set aside a provision equivalent to the estimated lifetime credit losses.

Currently, the banks provide it after a borrower fails to repay the loan for over **90 days.**

- The benefits of ECL-based provisioning would be **phased out over five years**.
- **Aim:** The primary objective of such a transitional arrangement is to avoid a "capital shock" by giving banks time to rebuild their capital resources following a probable negative impact arising from the introduction of ECL accounting.

RBI had ordered to all Banks, that **ECL-based provisioning** would be introduced during 2023–24 as part of its efforts to bolster the bad loan resolution system.

What are Non-Performing assets (NPAs)?

- They are loans or advances that are in default or in arrears.
- In other words, these are those kinds of loans wherein principal or interest amounts are late or have not been paid.

When a loan is classified as NPA?

- Non-Performing Assets are basically Non-Performing Loans.
- In India, the timeline given for classifying the asset as NPA is 180 days. As against 45 to 90 days of international norms.

Why is there a need to recognise NPAs?

- In the banking system, the government and regulatory authorities need to have a good view of how healthy the financial system is.
- India became more aggressive in recognising loans as 'bad' in the 2014 to 2015 period.
- The periodic asset quality review was introduced. Further, the regulator stepped in to prevent ever-greening of loans (i.e., lending more to an already stressed asset in the hope that it could be brought back to its feet).

What process does a bank undertake to recover NPA?

- The banks employ the Lok Adalats for settling the NPA loans. The Lok Adalats help in settling the NPA between the banks and defaulters.

Impact of NPAs on Financial Operations

- This reduces the profits of the banks.
- This reduces a bank or financial institution's capital adequacy.
- The banks have become averse to giving loans and taking risks of zero per cent. Thus, the creation of fresh credit is debarred.
- The banks start concentrating on the management of credit risk instead of the bank becoming profitable.
- The funds happen to cost due to NPA.

ANGEL TAX FOR START-UPS

Context: **Recently, the Central Board of Direct Taxes (CBDT) has directed its officers to not carry out scrutiny of 'angel tax' provisions for start-ups recognised by the Department for Promotion of Industry and Internal Trade (DPIIT).**

What is Angle Tax for Start-ups?

- Angel tax – which is income tax at the rate of **30.6 per cent** – is levied when an **unlisted company** issues shares to an investor at a price higher than its fair market value.

Background:

- Earlier the angle tax was imposed only on investments made by a '**resident investor'.**
- However the **Finance Act 2023** proposed to extend angel tax even **to non-resident investors** from April 1, 2023.
- In a directive issued in this accordance, the tax department has asked its field officials to **not do verification** for the recognized start-ups for cases pertaining to **Section 56 (2) (viib) of the Income-tax Act**, which was amended in the **Finance Act, 2023** bringing in **non-resident investors** also under the angel tax levy.

Section 56(2)(viib) of **Income-tax Act** pertains to taxing **unlisted companies**, including start-ups, for **receiving equity investment exceeding face value**. It aims to curb generation of unaccounted money.

What are the updated provisions regarding Angle-tax for Start-ups?

- **DPIIT-Recognized Start-ups Exempt from Angel Tax Scrutiny:** CBDT's directive specifies that start-up companies recognized by **DPIIT (Department for Promotion of Industry and Internal Trade)** are exempt from scrutiny related to amended provisions of angel tax.

DPIIT-Recognized Start-ups: These start-ups meet the criteria set by DPIIT, which typically includes aspects like. Being recognized by DPIIT can provide various benefits and exemptions, including relief from certain **innovation, scalability, and potential to create employment** taxes and compliance requirements.

- **Procedure for Assessment of Start-ups Outlined:**
  - For start-up companies under scrutiny solely for the applicability of section 56(2)(viib) of the Income-tax Act, Assessing Officers will not verify this issue during proceedings under section 143(2) or 147/143(2) of the Act.
  - The **contention of recognized start-ups** on this matter will be summarily accepted.
- **Exclusion of Section 56(2)(viib) During Multi-Issue Scrutiny:** In cases where start-up companies are under scrutiny for multiple issues, including section 56(2)(viib), this specific section will not be pursued during the assessment proceedings for such start-up companies.

Provision related to Angle Tax under Finance Act 2023:

- **Amendment of Section 56(2)(viib):** Finance Act 2023 modified the 'angel tax' provision to include foreign investors in start-up funding taxation.
- **Exemption for Recognized Start-ups:** DPIIT-recognized start-ups were excluded from angel tax, sparing them from this tax liability.
- **Final Valuation Rules for Investors**: Finance Ministry established valuation rules, including methods like DCF, for resident and non-resident investors in unlisted companies.
- **Exemption for Investors from Certain Countries:** Angel tax was waived for investors from **21 countries,** but countries like **Singapore, Netherlands, and Mauritius** were excluded.

Central Board of Direct Taxes (CBDT):

- It is a **statutory authority** functioning under the Central Board of Revenue Act, 1963.
- The CBDT is a part of the Department of Revenue in the Ministry of Finance.
- **Functi ons:**
  - Its functions include formulation of policies, dealing with matters relating to levy and collection of direct taxes, and supervision of the functioning of the entire Income Tax Department.

- CBDT also proposes legislative changes in direct tax enactments and changes in rates and structure of taxation in tune with the policies of the Government.

- **Structure:** The CBDT is headed by Chairman and also comprises of six members, all of whom are ex-officio Special Secretary to the Government of India.
  - Member (Income Tax)
  - Member (Legislation and Computerization)
  - Member (Revenue)
  - Member (Personnel & Vigilance)
  - Member (Investigation)
  - Member (Audit & Judicial)

GOVERNMENT LAUNCHES 'GREEN CREDIT' PROGRAMME

Context: **Recently, the Government has introduced Green Credit Programme, where an individual or entity can earn green credit and trade it on a dedicated exchange.**

'Green Credit' refers to **a unit of an incentive provided** for a specified activity; delivering a positive impact on the environment.

About the Programme:

- A Green Credit programme is being launched **at the national level** to leverage a competitive market-based approach for green credit for incentivizing environmental actions of various stakeholders.
- This programme is a follow-up action of the '**LiFE'-(Lifestyle for Environment) campaign**.

The notification by **Ministry of Environment, Forest and Climate change** has clarified that the Green Credit Programme is independent of the **carbon credit** provided under the **Carbon Credit Trading Scheme, 2023** which was made under the **Energy Conservation Act, 2001**.

- However, an environmental activity generating **green credit** may have climate co-benefits, such as **reduction or removal of carbon emissions** and an activity generating green credit under **Green Credit programme** may also get carbon credit from the same activity.
- **This programme will cover 8 types of activities**:
  - Tree plantation which is meant to promote activities for increasing the green cover across the country.
  - Water management is meant to promote water conservation, water harvesting, and water use efficiency or water savings, including treatment and reuse of wastewater.
  - Sustainable agriculture is meant to promote **natural and regenerative agricultural practices** and land restoration to improve productivity, soil health, and nutritional value of food produced.
  - Waste management is meant to promote **circularity, sustainable and improved practices** for waste management, including collection, segregation, and environmentally sound management.
  - Air pollution reduction is meant to promote measures for reducing air pollution and other pollution abatement activities.
  - And mangrove conservation and restoration, which is meant to promote measures for conservation and restoration of mangroves.
- **Process of registration:**
  - One needs to register the activity with the Administrator electronically through a website to avail green credit.
  - The activity will then be verified by a **designated agency** and based on its report the Administrator shall grant the applicant a certificate of green credit.
  - The calculation of **green credit in respect of any activity undertaken** shall be based on equivalence of resource requirement, **parity of scale, scope, size, and other relevant parameters** required to achieve the desired environmental outcome.
- **Significance:**
  - The Programme will incentivise environmentally-positive actions through a market-based mechanism and generate green credit, which shall be tradable and made available for trading on a domestic market platform.
  - The initiative aims to encourage **industries, companies, and other entities** to meet their existing or other obligations, under any law that is in force for the time being and encourage other persons and entities, to undertake voluntary environmental measures by generating or buying green credit.

However, the green credit **generated or procured** to fulfill any obligation, in compliance with any law, that is in force for the time being shall not be tradeable.

LARGE OZONE HOLE DETECTED OVER ANTARCTICA

Context: **As per a latest update, the Satellite measurements over Antarctica have detected a giant hole in the Ozone layer.**

About the information:

- The hole also called as "**ozone-depleted area**" was identified of around **26 million square kilometers** (10 million square miles) in size, roughly three times the size of Brazil.
- The European Space Agency **Copernicus Sentinel-5P satellite** made the recordings, as part of the EU's environmental monitoring program.

The Ozone Layer:

- Ozone is a special form of oxygen, made up of **three oxygen atoms** rather than the usual two oxygen atoms.
- It usually forms when some type of radiation or electrical discharge separates the tw**o atoms in an oxygen molecule (O2),** which can then individually recombine with other **oxygen molecules to form ozone (O3).**
- The ozone layer is a trace gas in **the stratosphere**, one of the four layers of the Earth's atmosphere.
- It functions as a protective gas shield that **absorbs ultraviolet radiation**, protecting humans and ecosystems from dangerous amounts of UV.

Most skin cancers are caused by exposure to high amounts of UV radiation, so anything that shields us from UV rays helps reduce cancer rates.

What is Ozone hole?

- An ozone hole is the thinning of the ozone layer boosted in size by colder temperatures.
- As the temperature high up in the stratosphere starts to rise, ozone depletion slows; the polar vortex weakens and breaks down.
- By the end of December, ozone levels return to normal. This time around, however, the process took longer.
- The formation of ozone hole in the Antarctic has been an annual occurrence and has been recorded for the last 40 years.
- Human-made chemicals migrate into the stratosphere and accumulate inside the polar vortex.
- It begins to shrink in size as warmer temperatures dominate.

The science behind Human induced ozone depletion:

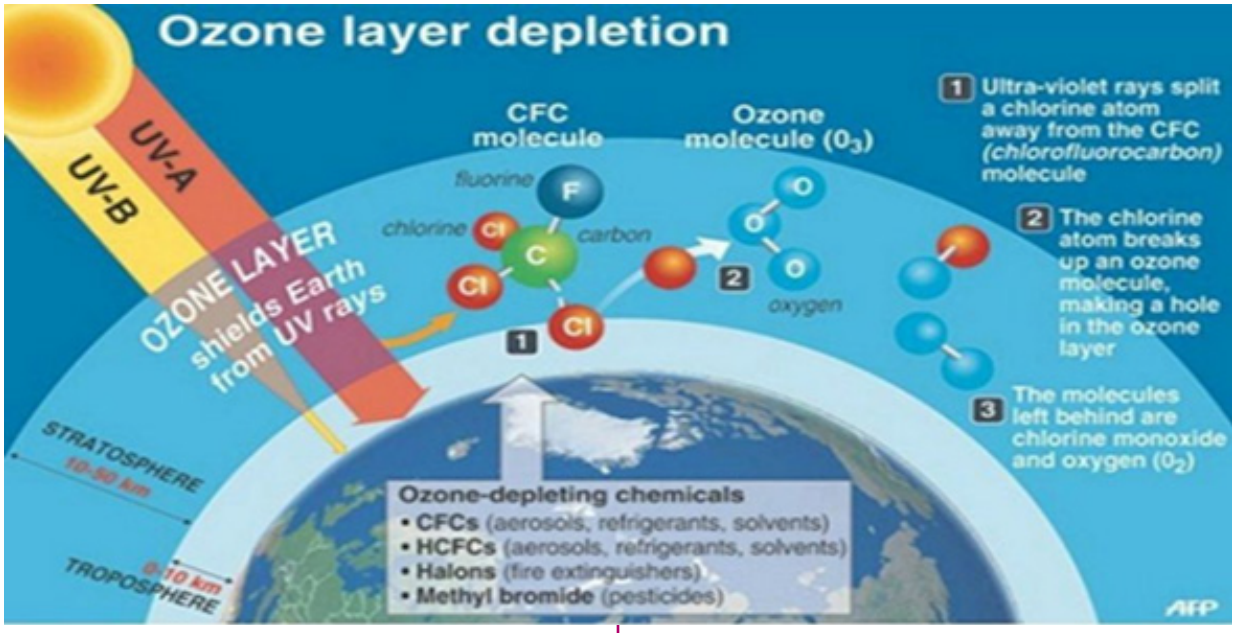
- Ozone depletion occurs when chlorofluorocarbons (CFCs) and halons (gases formerly found in aerosol spray cans and refrigerants) are released into the atmosphere.
- Ozone sits in the upper atmosphere and absorbs ultraviolet radiaton, another type of solar energy that's harmful to humans, animals and plants.
- CFCs and halons cause chemical reactions that break down ozone molecules, reducing ozone's ultraviolet radiation-absorbing capacity.

Factors contributing to natural Ozone depletion:

- Volcanic eruptions
- Increase in Ocean temperature
- Antarctica's atmospheric action
- Planetary Winds over Antarctica

Does always Ozone layer depletion is Human caused?

- According to scientists, the size of the ozone hole over Antarctica fluctuates each year, opening each year **in August** and closing again in **November or December**.
- Ozone hole opens up because of the rotation of the Earth causing **specials winds** over the closed landmass of Antarctica.
- The winds create a **mini climate**, creating a shield over Antarctica preventing it from mixing with surrounding air. When the **winds die down**, the hole closes.



GLOBAL HYDROGEN REVIEW 2023

Context: **According to release of the Global Hydrogen Review 2023 by the International Energy Agency (IEA), despite increasing global political support, green hydrogen (Biohydrogen) constitutes less than 1 per cent of the world's hydrogen production and usage.**

- As per the report, to align with the IEA's Net Zero Emissions (NZE) Scenario, green hydrogen capacity must grow more than **100 times by 2030**.

What is Green hydrogen?

- Green Hydrogen is **colourless, odourless, tasteless, non-toxic** and highly combustible gas.
- Hydrogen is the lightest, simplest and most abundant member of the family of chemical elements in the universe.
- Green hydrogen is produced through electrolysis using renewable sources of energy such as **solar, wind or hydel power.**

Ways to extract Hydrogen:

- In the natural environment, hydrogen is not readily available in its pure form as it forms compounds with other elements like oxygen and carbon.
- It exists within various compounds, including water, biomass and hydrocarbons.
- Different pathways have been developed to **extract hydrogen from these compounds**, and these methods are categorised into conventional and renewable technologies based on the raw materials used.

Green hydrogen is India:

- Under the **Paris Agreement** (a legally binding international treaty on climate change with the goal of limiting global warming to below 2°C compared to pre-industrial levels) of 2015, India is committed to reducing its greenhouse gas emissions by 33-35% from the 2005 levels.
- At the 2021 Conference of Parties in Glasgow, India reiterated its commitment to move from a fossil and import-dependent economy to a net-zero economy by 2070.
- In order to become energy independent by 2047, the government stressed the need to introduce green hydrogen as an alternative fuel that can make India the global hub and a major exporter of hydrogen.
- India has just begun to generate green hydrogen with the objective of raising non-fossil energy capacity to 500 gigawatts by 2030.
- In April 2022, the public sector OIL, which is headquartered in eastern Assam's Duliajan, set up India's first 99.99% pure green hydrogen pilot plant in keeping with the goal of "making the country ready for the pilot-scale production of hydrogen and its use in various applications".
- The plant was set up at the petroleum exploration major's **Jorhat pump station**, also in eastern Assam.
- Powered by a 500 KW solar plant, the green hydrogen unit has an installed capacity to produce 10 kg of hydrogen per day and scale it up to **30 kg per day**.

International Energy Agency (IEA):

- The International Energy Agency is an autonomous Intergovernmental Organisation.
- The IEA was established in 1974 by developed countries - under the auspices of the Organization for Economic Co-operation and Development (OECD) - in response to the oil embargo.
- IEA is made up of **30 member countries** and eight associate nations.
  - Four countries are seeking accession to full membership - Chile, Colombia, Israel and Lithuania.
- India became an Associate member of IEA in March 2017 but it was in engagement with IEA long before its association with the organization.
- The **World Energy Outlook report** is released by the IEA annually.
- Its purpose is guided by **four main areas** of focus:
  - Energy security
  - Economic development
  - Environmental awareness
  - Global engagement

WORLD'S WATER CYCLE SEVERELY IMPACTED BY CLIMATE CHANGE: WMO

Context: **As per World Meteorological Organization (WMO's) State of Global Water Resources 2022 report, the ongoing melting of snow, ice and glaciers compounded the threat, exacerbating the risk of extreme weather events such as floods.**

Findings of the Report:

- According to WMO, the circulation of water in the **Earth-Atmosphere system** has been significantly impacted by **climate change and human activities**.
- The effect on the **hydrological cycle** is leading to **droughts and extreme rainfall** events and the erratic water cycles unleashed widespread **disruption, burdening livelihoods and economies**.
- The report highlighted, **the Asian Water Tower (AWT),** the world's largest reservoir of ice and snow after the Arctic and Antarctic regions which saw significant glacial melting in 2022.
- These alterations impacts the natural downward flow of major rivers — **the Indus, Amu Darya, Yangtze and Yellow River** in the region.

AWT covers the **Third Pole**, which includes the **Tibetan Plateau, the Himalayas, the Karakorum, the Hindu Kush, the Pamirs and the Tien Shan Mountains.**

- The increasing pace of glacial melting in AWT, which provides a reliable water supply to almost **two billion people,** highlighted the deepening influence of climate change on regional water resources.
- Report emphasized **SDG 13 (climate adaptation)** by focusing on climate-related impacts on water systems and calling for mitigation actions.

What is Hydrological cycle?

- Hydrological cycle is also known as the **"water cycle"** is the normal water recycling system on Earth.
- The hydrologic cycle involves the continuous circulation of water in the **Earth-Atmosphere system.**
- At its core, the water cycle is the motion of the water from the ground to the atmosphere and back again.
- Of the many processes involved in the hydrologic cycle, the most important are: **Evaporation, Transpiration, condensation, precipitation and runoff.**
- **Process:**
  - Due to solar radiation, water evaporates, generally from the **sea, lakes, etc**. Water also evaporates from plant leaves through the mechanism of transpiration.
  - As the steam rises in the atmosphere, it is being **cooled, condensed, and returned to the land** and the sea as precipitation.
  - Precipitation falls on the earth as surface water and shapes the surface, creating thus streams of water that result in **lakes and rivers**.
  - A part of the **water precipitating penetrates** the ground and moves downward through the incisions, forming aquifers.
  - Finally, a part of the surface and underground water leads to sea.
  - During this trip, water is converted in all phases: **gas, liquid, and solid**.

Factors affecting Hydrological cycle:

- **Physical factors:**
  - **Relief** – the steeper the slope, the more quickly water will reach the river.
  - **Vegetation (Type and density)** – the more vegetation there is, the more will be absorbed/ intercepted and then transpired back into the atmosphere.
  - **Size of basin**– water comes from a bigger area so more water is in the cycle compared to other areas.
  - **Rock type:** Some rocks are more permeable than others (allow water to pass through them). Some rocks are better at storing water.
- **Human factors:**
  - Forestry, Urbanisation, Mining, Deforestation, Reservoir/dam building and Irrigation.

Impacts:

- **Ecological Disruption:**
  - **Altered Habitats**: Changes in the water cycle can lead to alterations in natural habitats. For instance, droughts can lead to the drying up of wetlands and rivers, affecting the flora and fauna that depend on these ecosystems.
  - **Loss of Biodiversity**: Disruptions can result in habitat loss and degradation, reducing biodiversity. Some species may struggle to adapt or find new suitable habitats, leading to a decline in population numbers.
  - Invasive Species: Altered water flow patterns can facilitate the spread of invasive species. These species, which are not native to an ecosystem, can outcompete native species and disrupt local food chains.
- **Human Socioeconomic Impacts:**
  - **Water Shortages and Conflicts**: Disruptions in the water cycle can lead to water shortages, sparking conflicts over access to this vital resource. This is particularly pronounced in regions with limited water resources.
  - **Economic Losses:** Industries dependent on water, such as tourism, fishing, and manufacturing, can face economic losses due to disruptions in water availability and quality.
  - **Health Risks:** Changes in water availability can impact public health, as inadequate water supply can lead to sanitation issues and the spread of waterborne diseases.
  - **Infrastructure Vulnerability**: Infrastructure designed based on historical water patterns may become vulnerable to extreme events, such as flooding, if those patterns change.

SINKING ISLANDS OF INDIA

Context: **The National Green Tribunal (NGT) has decided to issue notices to the Coastal Zone Management Authorities (CZMAs) in the coastal States and Union Territories asking it to consider including the recommendations made by an expert panel on the issue of dangers of sea level rise and submergence of low-lying lands into the Integrated Island Management Plans (IIMPs).**

About:

- NGT asks coastal zone authorities to integrate expert panel recommendations into **island management plans**.

- The Principal Bench of the tribunal issued an order stating that the suggestions incorporated in the panel report need to be looked into for preparation/ amendment of the IIMPs.
- The committee had recommended island-specific sustainable development and tourism policy keeping the climate risks in mind.

Why are some islands in India sinking?

- India has a fragile network of over **1,382 islands**.
- However, several of these islands are under threat due to unseasonal cyclonic storms, sea erosion and new development projects.
- One such island in **Lakshadweep** has entirely disappeared from the map.
- So, let us take a look at islands across the country that are under threat:

Lakshadweep

- Lakshadweep has a land area of just **32 sq.km**. And a population of 70,000.

- Lakshadweep lagoons cover an area of 4,200 sq.kms.
- A group of scientists in 2021 urged the Central govt. to rethink the **water villa project steered by NITI Aayog.** They feared it would destroy the lagoons.
- Coastal constructions and unseasonal cyclones are causing soil erosion.

According to a study, waters surrounding **the archipelago** are expected to rise **by 0.78 mm each year** in the 2080-2100 period. Smaller islands may therefore experience loss of land along the coast.

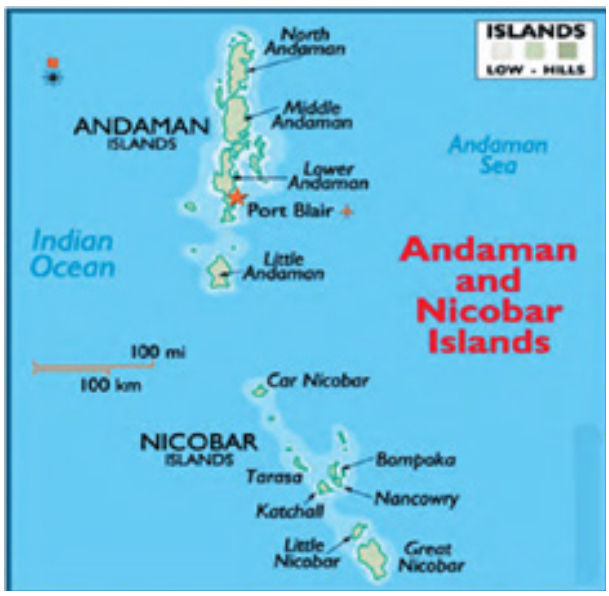
Vaan island

- Vaan Island is located 6 kms from Thoothukudi coast, Tamil Nadu.
- This island in the **Gulf of Mannar** almost vanished from the map, about a decade ago.

- A team of underwater researchers have been working in the Gulf of Mannar for 25 years to reverse the damage caused by large scale coral mining till the 1990s.
- In 2013, Vaan Island split into two. The northern part submerged as the waves hit the islet directly in the absence of corals, causing rapid erosion.

Andaman and Nicobar islands

- The light house at **Indira Point in the Andaman and Nicobar islands** sank about four metres during the tsunami of 2004.



- In the Nicobar Islands, 97% of the **mangrove cover** was lost.
- The region witnessed over **450 earthquakes** in the last 10 years.
- The sea level rise here is estimated to be 5mm per year, way higher than the global average.

Ghoramara

- Ghoramara is located at the **southernmost part** of West Bengal.
- The tall palm trees on the edge of the island struggle to hold on to the depleting soil.
- One of the sources of income in this island was **betel leaf cultivation**.
- Before cyclone Yaas in 2021, there were about **550 units** of betel leaf plantations.

Majuli island

- Majuli is in Assam, India's first island district.
- Its current geographical area is 483 sq. kms. But Majuli used to be 1,250 sq. km. before 1950.

- **Reasons for this reduction:** riverine erosion and embankments on the southern bank of the Brahmaputra.
  - Paddy and mustard cultivation has suffered and so has fishing that was once a major source of income for many in Majuli.

Munroe Thuruthu

- Munroe Thuruthu Island in Kerala is witnessing steady deterioration.
- The island is ravaged by constant tidal flooding and ground subsidence. The once-fertile island now resembles a **saline swamp** and agriculture is nearly impossible.
- The researchers say that the lack of freshwater, sediment from the Kallada River, and the presence of several saline pools have been affecting both soil fertility and groundwater quality.

Impacts of Sinking Islands:

- Making Tribal Population living in the regions and Islands homeless, as some of them were living there for centuries.
- **Species loss:** The sinking islands can drain a few indigenous species native to the region/island by habitat destruction.
- **Mangrove Loss:** The islands in West Bengal and Odisha are already facing mangrove loss in the sinking island.

Way Forward:

- **Shifting to safer places**: Indonesia recently changed its capital from Jakarta to Borneo due to the fear of submergence of the world's fastest sinking city, i.e, Jakarta.
- **Mitigation of effects**: The native government must take steps to curb the impacts and prepare resources availability such as for agriculture and water management.
- **Community awareness:** People also not living in that place must understand the need of urgency and steps to be taken as soon as possible.

NOBEL PRIZE IN MEDICINE 2023

Context: **The 2023 Nobel Prize in Physiology or Medicine has gone to scientists Katalin Kariko and Drew Weissman, whose work enabled the development of mRNA vaccines against Covid-19.**

The prize

- The Nobel prize was created by Alfred Nobel, a 19th Century businessman and chemist from Sweden.
- Nobel, the inventor of dynamite, was an exceedingly wealthy man.
- He created the annual prize to honour "those who, during the preceding year, have conferred the greatest benefit to humankind."

What is mRNA?

- Messenger RNA (mRNA) is a type of **single-stranded RNA** involved in **protein synthesis**.
- They are made from a **DNA template** during the process of transcription.
- The role of mRNA is to carry protein information from the DNA in a cell's nucleus to the cell's cytoplasm

(watery interior), where the protein-making machinery reads the mRNA sequence and translates each **three-base codon** into its corresponding **amino acid** in a growing protein chain.

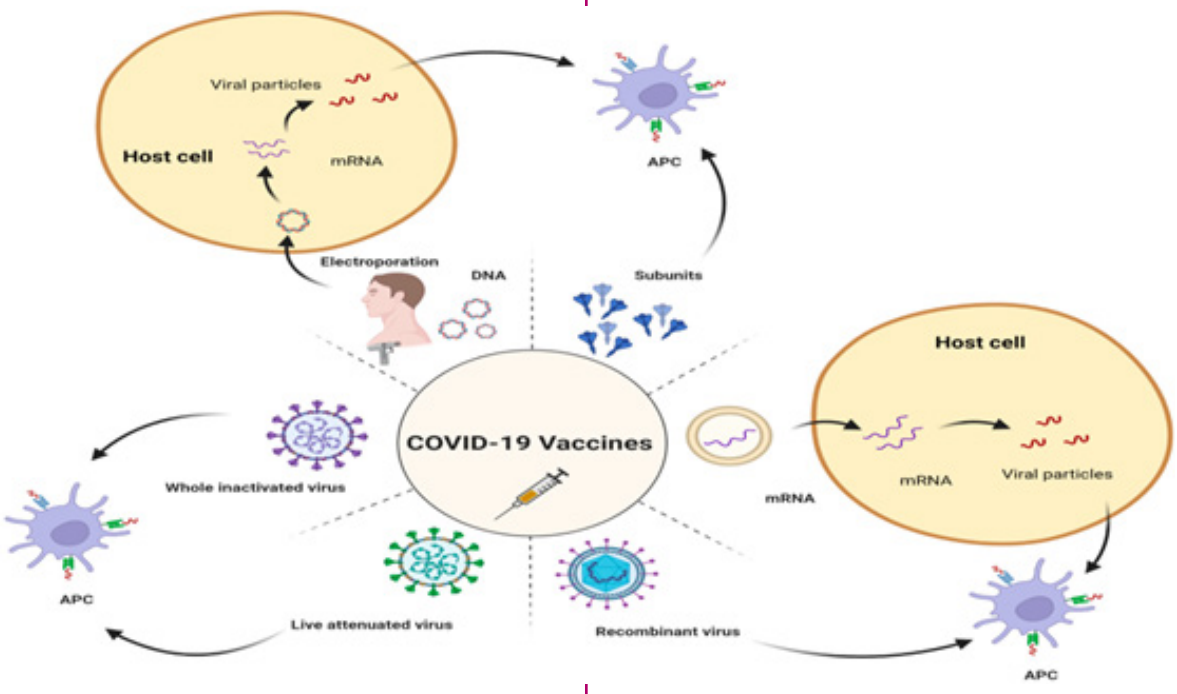
- So mRNA really is a form of nucleic acid which helps the human genome, which is coded in DNA, to be read by the cellular machinery.

Contribution of Nobel Prize winner scientists:

- Karikó and Weissman realised that the problem with **lab-grown genetically engineered mRNA** is that the body's dendritic cells recognise them **as a foreign substance**, and release inflammatory signalling molecules against them.
- To investigate this, they produced **different variants of mRNA**, each with unique chemical alterations in their bases, which they delivered to dendritic cells.
- The results were striking: The inflammatory response was almost abolished when base modifications were included in the mRNA.
- This later on became the basis for development of mRNA vaccines which helped during the COVID recovery.

About mRNA vaccines:

- **Background:** This technology had been known since the 1980s, but had not been perfected enough to create vaccines at a viable scale.
  - Basically, instead of putting **an inactivated virus** in the body to activate an immune response, vaccines using this technology **use messenger Ribonucleic Acid, or mRNA**, to deliver a message to the immune system.
  - Genetically engineered mRNA can instruct cells to make the protein needed to fight a particular virus.
- **Working:**
  - 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.



How are mRNA vaccines made?

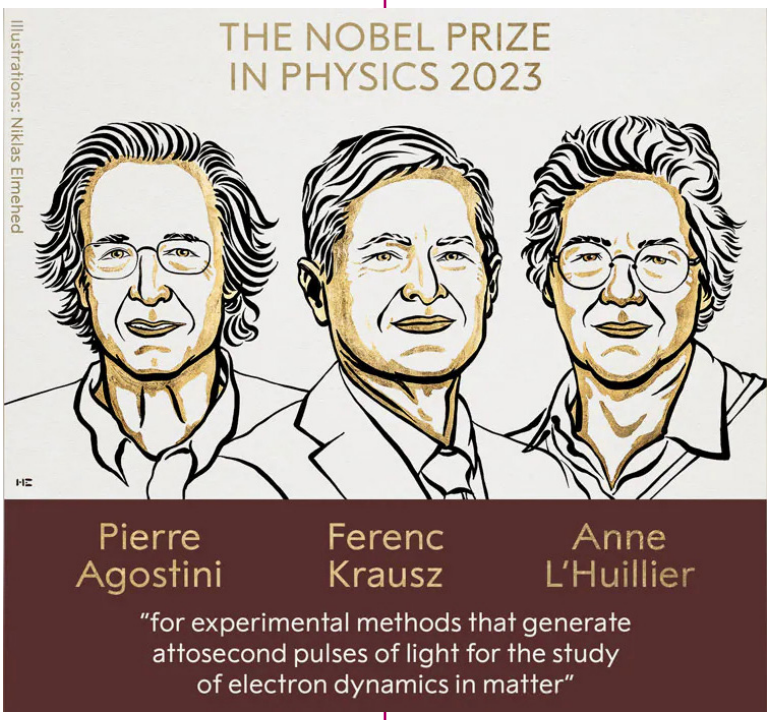
- To make an mRNA vaccine, scientists must first identify a protein on the outside of the virus that the body's immune response will respond to (the "target" protein).
- The protein they choose must be sufficiently different from proteins on the outside of the body's own cells, so the immune system only 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.

NOBEL PRIZE IN PHYSICS 2023

Context: The Royal Swedish Academy of Science has announced that the 2023 Nobel Prize in Physics.

About the Prize:

- **What's the name of the prize?** The Nobel Prize in Physics 2023.
  - The prize, which was raised this year to 11 million Swedish **crowns (about $1 million),** is awarded by the Royal Swedish Academy of Sciences.
- **Who has won the prize?** Pierre Agostini, Ferenc Krausz and Anne L'Huillier.
- **What have they won the prize for?** For experimental methods that generate attosecond pulses of light for the study of electron dynamics in matter. Their experiments gave humanity new tools to explore the **world of electrons inside atoms and molecules**.



Their Contribution:

- Agostini, Krausz and L'Huiller developed a new way to create **extremely short pulses of light** that can be used to measure the rapid processes by which **electrons move or change energy.**
- Their experiments helped produce pulses of light so short that they can be measured **in attoseconds.**
- This means that the pulses can be used to provide **images of the processes inside atoms and molecules**.

An attoseconds is equal to a quintillionth (10−18) of a second.

- The research conducted by the Laureates over a span of several decades allowed them to investigate processes that were so rapid that they were previously impossible to follow.

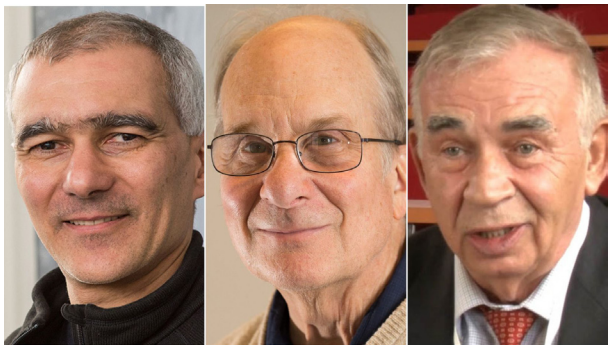
- This new technology is important to understand and control **how electrons behave in a material**.

What are electrons?

- An electron is a **negatively charged subatomic particle** that can be either bound to an atom or free (not bound).
- An electron that is bound to an atom is one of the three primary types of particles within the atom -- **the other two are protons and neutrons.**
- **Key features:**
  - Electrons are unique from the other particles in multiple ways.
  - They exist outside of the nucleus, are significantly smaller in mass and exhibit both **wave-like and particle-like characteristics.**
  - An electron is also an elementary particle, which means that it is not made up of smaller components.
  - Protons and neutrons are thought to be made **up of quarks**, so they are not elementary particles.

CHEMISTRY NOBEL 2023

Context: **Moungi G. Bawendi, Louis E. Brus and Alexei I. Ekimov trio has been awarded the Nobel Prize in Chemistry 2023 for the discovery and development of quantum dots.**



What are quantum dots?

- Quantum dots (QDs) are **man-made nanoscale crystals** that exhibit unique optical and electronic properties, including the ability to transport electrons and emit light of various colors when exposed to UV light.
- These artificially synthesized semiconductor nanoparticles have a wide range of potential applications, including use in composites, solar cells, fluorescent biological labeling, displays, lighting, and medical imaging.
- They were first discovered **in 1980.**

The discovery:

- Their study revealed that, Electrons can absorb energy and emit light of a certain colour, depending on **the size of the quantum dot.**
- When semiconductor particles are **made small enough**, they exhibit **quantum effects**, which restrict the energies at which **electrons and holes** (the absence of electrons) can exist within the particle.
- As energy is linked to wavelength (or color), this results in the optical properties of the particle being tunable based on its size.
- By controlling the size of the particle, it can be made to **emit or absorb specific wavelengths** (colors) of light.

About contributions:

- **Alexei Ekimov** maps the mysteries of coloured glass, studying optical methods, used as diagnostic tools for assessing the quality of semiconducting material. Researchers shine light on the material and measure the absorbance.
  - This reveals what substances the material is made from and how well-ordered the **crystal structure is.**
- **Louis E. Brus** shows that the strange properties of particles are quantum effects: This was the first time someone had succeeded in deliberately producing quantum dots – nanoparticles that cause **size-dependent quantum effects**.
- **Moungi Bawendi** and his research group succeeded in growing nanocrystals of a specific size. During this phase, the solvent helped give the crystals a smooth and even surface.
- The nanocrystals that Bawendi produced were almost perfect, giving rise to distinct quantum effects. Because the production method was easy to use, it was revolutionary – more and more chemists started working with nanotechnology and began to investigate the unique properties of quantum dots.

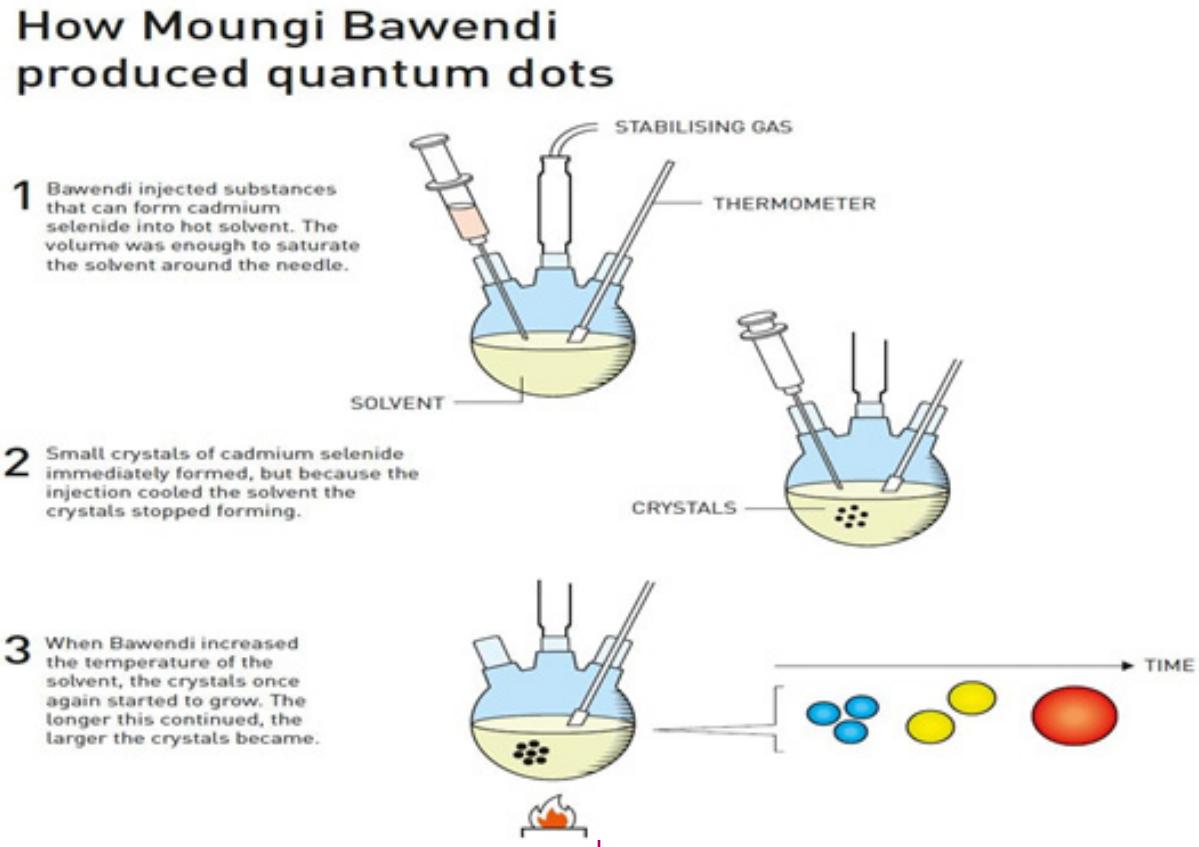
Application and Uses of Quantum dots:

- **In Television**: The luminous properties of quantum dots are utilised in computer and **television screens based on QLED technology,** where the Q stands **for quantum dot**.
  - In these screens, blue light is generated using the energy-efficient diodes that were recognised with the Nobel Prize in Physics 2014.
  - Quantum dots are used to **change the colour of some of the blue light**, transforming it into **red or green**.
  - This makes it possible to produce the **three primary colours of light** needed in a television screen.
- **In LED lamps**: Similarly, quantum dots are used in some LED lamps to adjust the cold light of the diodes.

- The light can then become as energising as daylight or as calming as the warm glow from a dimmed bulb. The light from quantum dots can also be used in biochemistry and medicine.

◈ **In Biochemistry**: Biochemists attach quantum dots to biomolecules to map cells and organs.

- Doctors have begun investigating the potential use of quantum dots to **track tumour tissue** in the body.
- Chemists instead use the catalytic properties of quantum dots to **drive chemical reactions**.



MICROALGAE AND CLIMATE CHANGE

Context: **According to research findings of Nature Microbiology, microalgae are firing up a light-responsive protein to use sunlight for growth, which is enhancing in the contemporary times of climate change.**

About Microalgae:

◈ Microalgae, which form the **base of the food chain** in the ocean and capture carbon dioxide from the atmosphere, appear to rely on a unique strategy to cope with global warming.

◈ As **climate change reduces the availability of nutrients** in the sea, marine microalgae or eukaryotic phytoplankton fire up a protein called rhodopsin.

◈ It is related to the protein in the human eye responsible for vision in dim light.

◈ This light-responsive protein is helping the microalgae flourish with the help of sunlight in place of traditional chlorophyll.

Impact of Climate Change on Microalgae:

◈ As climate change reduces the availability of nutrients in the sea, marine microalgae or eukaryotic phytoplankton fire up a protein called **rhodopsin.**

◈ It is related to the protein in the human eye responsible for vision in dim light.

◈ This light-responsive protein is helping the microalgae flourish with the help of sunlight in place of traditional chlorophyll.

Microbial Rhodopsins:

◈ They are proposed to be **major light capturers** in the ocean.

◈ Estimates suggested they may absorb as much light as chlorophyll-based photosynthesis in the sea, which also captures light to generate energy and food.

- However, their biological role in these organisms was unclear before the study.

- Global warming is increasing drought on land and the same thing happens in the ocean, the warmer the surface water gets, the lower are the nutrients in these surface water layers.
- There is less mixing between the surface waters and nutrient-rich deeper waters as the oceans warm.
  - So nutrients become scarce at the surface, impacting the primary producers such as microalgae that are present in the top layer.
- Algae starve and, therefore, produce **less food and capture less carbon dioxide** from the atmosphere.
- In these areas, the capacity of algae to make food and take up carbon dioxide should be much more reduced similar to reduced crop yield on land if **iron- and nitrogen-rich fertilisers** are scarce.

The Role of Rhodopsins:

For algae to produce food and to remove carbon dioxide from the atmosphere, they need sunlight. To harness sunlight, the microalgae require a lot of iron. However, **35 per cent** of the surface of the ocean does not have enough iron to support the growth of algae.

The Location of phenomena:

- This phenomenon is particularly relevant for the **Southern Ocean**, which is the largest iron-limited aquatic ecosystem.
- But they are home to the largest populations of consumers such as **krill, fish, penguins and whales**, which depend on primary producers such as microalgae.

Way Forward:

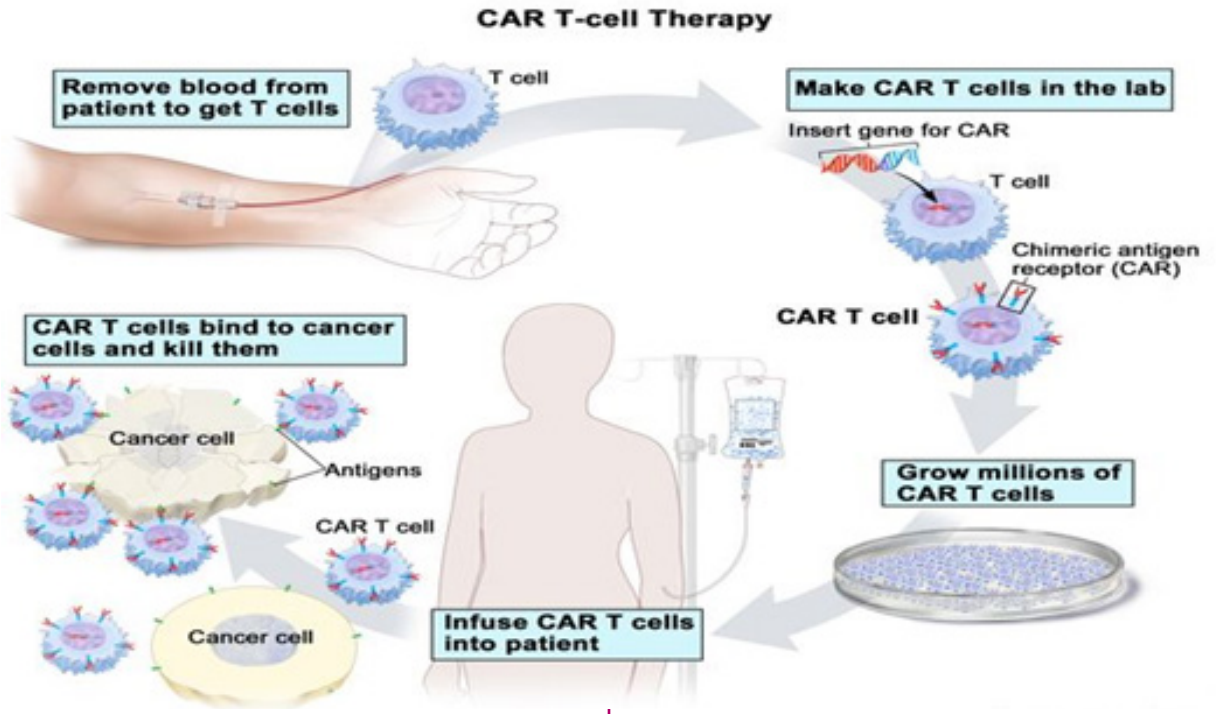
- According to the researchers, these phenomena have the potential to reduce the negative effects of changing environmental conditions, such as ocean warming and even the reduction in the productivity of crops.
- The same mechanism could be deployed to enhance the activity of microbes that cannot use light, **such as yeast.**
- It can be modified so that they can use light for growth, which is desirable in biotechnology, such as the production of **insulin, antibiotics, enzymes, antivirals and even biofuel**.

INDIA'S CAR-T CELL THERAPY GETS MARKET AUTHORISATION

Context: **The Immunoadoptive Cell Therapy Private Limited (ImmunoACT) has announced the approval of India's first chimeric antigen receptor (CAR) T-cell therapy by the Central Drugs Standard Control Organization (CDSCO) for treating leukaemias (cancers arising from the cells that produce white blood cells) and lymphomas (arising from the lymphatic system).**

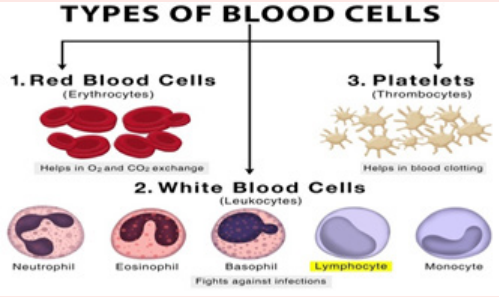
What is Chimeric Antigen Receptor (CAR) T-cell Therapy?

- It is a type of cancer immunotherapy treatment.
- Unlike **chemotherapy or immunotherapy** which involve taking drugs, CAR T-cell therapies use a patient's own cells.
- They are modified in the laboratory to **activate T-cells** and target tumor cells.
- **Procedure:**
  - T cells are taken from a patient's blood and then the gene for a special receptor that binds to a certain protein on the patient's cancer cells is added to the T cells in the laboratory.
  - The special receptor is called a chimeric antigen receptor (CAR). Large numbers of the CAR T cells are grown in the laboratory and given to the patient by infusion.



What are T Cells?

- T cells, also known as **T lymphocytes**, are a type of white blood cell that plays a central role in the immune response.
- T cells are involved in **cell-mediated immunity**, which means they help the body recognize and respond to foreign substances, such as **viruses, bacteria, and abnormal cells, such as cancer cells.**
- There are two major types of T cells: **the helper T cell and the cytotoxic T cell.**
- As the names suggest, helper T cells 'help' other cells of the immune system, whilst cytotoxic T cells kill virally infected cells and tumors.



Need for such T-cell Therapy:

- Systemic therapy such as chemotherapy, which attacks cancer cells due to their fast growth.
  - Chemotherapy drugs have limited success and significant side effects because they affect many types of cells in the body.
- Other treatments also known as **immunotherapy,** which work by binding to specific targets on the cancer or immune cells supporting its growth.
  - This approach is less toxic as it affects fewer non-tumor cells, but only works on tumours that have these targets.
- Thus, using own living cell becomes an idea.

Role of Central Drugs Standard Control Organization (CDSCO):

- Under the **Drug and Cosmetics Act,** the regulation of **manufacture, sale and distribution** of Drugs is primarily the concern of the State authorities while the Central Authorities are responsible for approval of New Drugs, Clinical Trials in the country, laying down the standards for Drugs, control over the quality of imported Drugs, coordination of the activities of **State Drug Control Organisations** and providing expert advice with a view of bring about the uniformity in the enforcement of the Drugs and Cosmetics Act.
- Drug Controller General of India is responsible for approval of licenses of specified categories of Drugs such as blood and blood products, **I. V. Fluids, Vaccine and Sera.**
- Central Drugs Standard Control Organization functions under the **Directorate General of Health Services**.

NEW EVOLUTIONARY LAW EXPLAINS HOW LIVING BEINGS, MINERALS & SPECIES EVOLVE

Context: **Recently, the Scientists have proposed a new evolutionary law that can explain the evolution of living and non-living entities, from minerals to stars.**

Highlights of the study:

- The study aims to establish a relationship between evolution of **living beings, minerals and stars**.
- As life evolved from **single-celled to multi-celled organisms**, Earth's minerals, also became more complex, creating diversity. This, in turn, **drove biological evolution**.
- The researchers proposed that evolution occurs when a new configuration or a new arrangement of atoms and molecules works well and functions improve.
- In contrast to Darwin's theory of evolution, it defined function as primarily with survival but the new study highlights at least **three kinds of functions** that occur in nature.
  - The first function **is stability**, which means systems made up of stable arrangements of atoms or molecules will continue to survive.
  - The second one includes **dynamic systems** with energy supply.
  - The third **is "novelty"** — the tendency of evolving systems to explore new configurations or arrangements that can give rise to new behaviours or characteristics.

An example of novelty is when **single-celled organisms** evolved to use light to make food.

Other examples include new behaviours among **multi-cellular species** such as **swimming, walking, flying** and **thinking.**

- Similarly, early minerals on Earth possessed a stable arrangement of atoms, which acted as foundations for the evolution of the next generations of minerals.
- These minerals were then incorporated into life. For example, minerals are present in living organisms' shells, teeth and bones.
- **As for stars,** the first ones that formed after the **Big Bang** had two main ingredients: **Hydrogen and helium.**
  - Those earliest stars used these ingredients to make about **20 heavier** chemical elements.
  - The next generation of stars consequently produced almost **100 more elements**.
- The universe generates novel combinations of **atoms, molecules, cells, etc**.
- Those combinations that are stable and can go on to engender even more novelty will continue to evolve.

What does the Evolution mean?

- Evolution is a process of gradual development in a particular situation or thing over some time and also a gradual change in the characteristics of a population of animals or plants over successive generations.

What are the evidences of evolution present?

- The evidences supporting organic evolution are derived from a number of fields of Biology. Those discussed here are:
  - Morphological evidences
  - Embryological evidences
  - Palaeontological evidences
  - Molecular evidences

Mechanism of Evolution:

- Various theories about the mechanism of evolution have been proposed; some of them such as Lamarck's theory of "Inheritance of acquired characters" and De Vries' theory of 'mutation' are now of historical importance only.
- **Darwin's theory of Natural selection**: It still holds ground but was modified with progress in genetics and developed into the Modern synthetic theory which is regarded as the most valid theory of evolution.
  - According to Darwin "**when the environment changes, new adaptations get selected in nature and after many generations sufficient characteristics will have been changed so as to alter the species into a new one (origin of species).**"
- **Modern Synthetic Theory:**
  - The unit of evolution is 'population' which has its own gene pool.
    - Gene pool is the group of all **different genes of a population.**
  - Heritable genetic changes appear in the individuals of a population. These heritable changes or variations occur due to small mutations in the genes or in the chromosomes and their recombination.
  - Natural selection selects the variations which help in adapting to the environment.
  - A change in the genetic constitution of a population selected by natural selection is

responsible for evolution of a new species, since through interaction of variation and Natural Selection more offspring's with favourable genetic changes are born. This is called 'differential reproduction'.

- Once evolved, Reproductive Isolation helps in keeping species distinct.

Sources of organic variation:

- Variation arises in an individual member of a population, and if favourable, spreads into the population through "**differential reproduction**" by the action of natural selection.
- **Variations may occur by;**
  - Mutation, which is a sudden genetic change. It may be a change in a single gene (genic mutation or point mutation) or may affect many genes (chromosomal mutation).
  - Genetic recombination, which occurs in sexually reproducing organisms at every reproduction. The chromosomes and thus genes of the parents mix at random during zygote formation. That is why offspring of same parents are different from each other as they have different combinations of parental genes. Variation is also brought about when crossing over occurs during gamete formation.
  - Gene flow is when there is chance mixing of genes of closely related species through sexual reproduction.
  - Genetic drift occurs in small populations when a part breaks off from a large population. Only representative genes of the large population are present which undergo change at a right time and the small population may evolve into a new subspecies or species.

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Section B
[CONTEMPORARY ISSUES BASED ESSAY]

Topic

- History Repeats Itself, First as a Tragedy, Second as a Farce

HISTORY REPEATS ITSELF, FIRST AS A TRAGEDY, SECOND AS A FARCE

'The farther backward you can look, the farther forward you are likely to see.'

Winston S. Churchill

In the Indian context, Marx's statement "History repeats itself, first as tragedy, second as farce" holds immense relevance. India is a nation with a rich and complex history, with various cycles of events repeating themselves over time.

Communal riots have been a recurring problem in India, both before and after independence. These riots are conflicts between religious communities, and they often result in violence, property damage, and loss of life. The nature and intensity of communal riots have varied in pre- and post-independence India. These riots were often triggered by religious or political factors, such as the demand for a separate Muslim homeland or the assassination of a prominent political leader. There were several communal riots that took place in pre-independent India, fueled by religious, linguistic and ethnic differences. The **Moplah Rebellion** was a violent rebellion that took place in 1921 in the Malabar region of Kerala. The rebellion was led by Muslim tenants against their Hindu landlords and the British government. The rebellion resulted in the deaths of around 2,000 people, mostly Hindus. **The Direct Action Day** was a call for a communal strike by the Muslim League on 16 August 1946. It was observed as a **"Day of Action"** by the Muslim community to demand the creation of a separate Muslim state of Pakistan. The strike led to widespread communal violence, especially in the city of Calcutta (present-day Kolkata), resulting in the deaths of around 4,000 people. **The Punjab Riots** took place in 1947 during the partition of India and Pakistan. The riots were fueled by religious tensions between the Hindu, Muslim, and Sikh communities. The riots resulted in the deaths of thousands of people, with estimates ranging from 200,000 to 2 million. There have been several instances of communal riots that have taken place in India even after independence.

Gujarat Riots, 2002 communal violence broke out in Gujarat following the burning of a train carrying Hindu activists in Godhra. The riots lasted for several weeks, resulting in the deaths of over 1,000 people Muslims. **Delhi Riots** in 2020, communal riots broke out in several areas of Delhi, primarily between Hindus and Muslims. The riots were triggered by protests against the Citizenship Amendment Act (CAA) and resulted in the deaths of around 50 people. **Mumbai Riots** in 1992-1993, communal riots broke out in Mumbai after the demolition of the Babri Masjid in Ayodhya. The riots lasted for several months and resulted in the deaths of over 900 people. **Sikh riots** in 1984 were triggered by the assassination of Prime Minister Indira Gandhi. After India gained independence in 1947, the country continued to witness communal riots. These riots have been caused by a variety of factors, including religious differences, political tensions, and socio-economic disparities.

India faced several economic crises during the pre-independence period, some of which were a result of British colonial policies. **The Great Famine of 1876-78** was one of the worst famines in India's history, which occurred during the British colonial rule. The famine was caused by a combination of factors, including drought and the export of food grains from India to Britain. It is estimated that between 5.5 million and 10 million people died due to the famine. **The Bengal Famine of 1943** During World War II, India faced another severe famine in Bengal, which was exacerbated by British policies such as the export of food grains and the diversion of resources to the war effort. It is estimated that between 2.1 million and 3 million people died due to the famine.

The Great Depression of 1929 had a severe impact on India's economy. The prices of agricultural products fell, leading to a decline in the income of farmers. The depression also led to a decline in international trade, which affected India's exports and industrial production. The **Partition of India** in 1947 had a significant impact on the country's economy. The partition led to the division of industries, railways, and other resources between India and Pakistan. The migration of people also resulted in the displacement of skilled workers and entrepreneurs, leading to a decline in industrial production. India has faced several economic crises after independence, some of which were caused by internal factors and others by external factors. **Balance of Payments Crisis (1991)** was a severe balance of payments crisis, caused by a combination of factors, including a large trade deficit, high oil prices, and a decline in remittances. The crisis forced India to seek a loan from the International Monetary Fund (IMF) and implement economic reforms, including liberalization, privatization, and globalization. **Inflation Crisis (2013-14)**, India faced a high inflation crisis, with consumer price inflation exceeding 10%. The inflation was caused by a combination of factors, including a decline in the value of the Indian rupee, high food prices, and supply-side constraints. The crisis forced the government to implement monetary and fiscal measures to control inflation.

Agricultural Crisis in India's agricultural sector in recent years due to factors such as declining farm incomes, low productivity, and climate change. The crisis has resulted in farmers' protests and demands for better prices and support from the government.

Covid-19 Pandemic had a severe impact on India's economy, causing a decline in economic growth, loss of jobs, and reduced consumer spending. The pandemic also highlighted structural weaknesses in India's healthcare system and led to a humanitarian crisis, with millions of people facing hunger and poverty.

Ideological repetition refers to the continuation of certain ideas and beliefs before and after a significant event, such as independence. In the context of India,

there are some ideological repetitions that can be observed before and after independence. The idea of Indian nationalism was prominent before independence, as leaders like Mahatma Gandhi and Jawaharlal Nehru emphasized the need for an independent India that was free from British rule. The idea of secularism was also a part of the pre-independence ideology, as leaders like Nehru advocated for a secular India that would not discriminate on the basis of religion.

The idea of Indian nationalism continued after independence, as the country sought to establish itself as a sovereign nation and maintain its territorial integrity. The idea of secularism also continued after independence, as it was enshrined in the Indian Constitution and remains an important principle in Indian society. The idea of social justice also continued after independence, as the government has implemented various policies and programs to address the social and economic inequalities that exist in Indian society.

India has a long and complex history of war, both before and after its independence from British rule in 1947. **The Anglo-Mysore Wars (1767-1799)** is a series of four wars fought between the British East India Company and the Kingdom of Mysore, led by Tipu Sultan. **The Anglo-Maratha Wars (1775-1818)** is a series of five wars fought between the British East India Company and the Maratha Empire. **The First Anglo-Sikh War (1845-1846)** is a war fought between the British East India Company and the Sikh Empire. **The Indian Rebellion of 1857** also known as the Sepoy Mutiny, this was a major uprising against British rule in India, which ultimately failed but had lasting impact.

The India-Pakistan War of 1947 was the first of several wars fought between India and Pakistan over the disputed territory of Kashmir. **India-China War of 1962** was a border conflict between India and China that resulted in China gaining control of Aksai Chin. **The India-Pakistan War of 1971** led to the creation of Bangladesh, as well as India's victory over Pakistan. **Kargil War (1999)** is a limited war fought between India and Pakistan over the Kargil district in Kashmir. **India-China Border Conflict (2020)** is a border dispute between India and China that resulted in a violent clash in the Galwan Valley, resulting in the deaths of 20 Indian soldiers. There have been many wars in India's history, both before and after independence, the causes and contexts of these conflicts have varied widely. However, it is important to remember the human cost of these conflicts and work towards peaceful resolution of disputes in the future.

Caste-based discrimination has been a long-standing issue in India, both before and after its independence from British rule in 1947. The practice of untouchability was a severe form of caste-based discrimination, whereby certain castes were considered "untouchable" and subjected to extreme social and economic marginalization. Social reform movements such as the **Brahmo Samaj** and **Arya Samaj** emerged in the **19th century**, seeking to challenge the caste system and promote equality. The Constitution of India, includes provisions prohibiting caste-based discrimination and ensuring equal opportunities for all citizens. The Indian government has implemented a reservation system, whereby a certain percentage of government jobs, educational institutions, and political positions are reserved for members of historically disadvantaged castes and tribes. **Anti-discrimination laws** have been enacted to address caste-based discrimination, including the Scheduled Castes and Scheduled Tribes (Prevention of Atrocities) Act, 1989.

Despite these measures, caste-based discrimination continues to be a pervasive issue in India, affecting millions of people from historically disadvantaged castes and tribes. **The Peshtigo Forest fire** is often referred to as the deadliest in U.S. history, as it claimed the lives of over 1,500 people. The fire was caused by a combination of drought, high winds, and human activities such as logging and clearing land for farming. **The Great Hinckley Forest** fire in Minnesota was caused by a combination of dry weather, high winds, and sparks from logging operations. The fire killed over 400 people and destroyed much of the town of Hinckley. **The Black Saturday Bushfires (2009)** wildfires in Australia were caused by a combination of extreme heat, drought, and human activities such as arson and negligence. The fires killed 173 people and destroyed over 2,000 homes.

The Oil spill incidence **Amoco Cadiz Oil Spill (1978)** a supertanker, ran aground off the coast of Brittany, France, spilling more than 200,000 tons of crude oil into the ocean. The spill caused significant environmental damage and killed thousands of marine animals. **Gulf War Oil Spill (1991)** during the Persian Gulf War, Iraqi forces intentionally released approximately 240 million gallons of crude oil into the Persian Gulf, causing one of the largest oil spills in history. The oil polluted more than 600 miles of coastline and killed thousands of marine animals. An explosion on the **Deepwater Horizon oil rig (2010)** in the **Gulf of Mexico** caused more than 200 million gallons of crude oil to spill into the ocean over the course of several months. The spill killed 11 people and caused significant environmental damage to the Gulf Coast.

The recurrence of past mistakes is a complex occurrence that brings up inquiries about human nature and our ability to learn and progress. It implies that our aptitude to identify patterns and derive lessons from experience is not entirely dependable, and we have a tendency to replicate the same errors, even with the advantage of hindsight.

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GUJARAT'S DHORDO VILLAGE GETS UNWTO RECOGNITION

Context: **Recently, the list of Best Tourism Villages 2023 has been released by United Nations World Tourism Organization (UNWTO) where the Dhordo village of Gujarat made to get included in it.**

About the List of Best Tourism Villages 2023:

- The villages are evaluated under **nine key areas**, including;
  - Cultural and Natural Resources
  - Promotion and Conservation of Cultural Resources
  - Economic Sustainability
  - Social Sustainability
  - Environmental Sustainability
  - Tourism Development and Value Chain Integration
  - Governance and Prioritization of Tourism
  - Infrastructure and Connectivity
  - Health, Safety, and Security
- Best Tourism Villages by UNWTO recognizes outstanding **rural tourism destinations** with accredited cultural and natural assets, a commitment to preserving community-based values, and a clear commitment to innovation and sustainability across economic, social, and environmental dimensions.

About Dhordo Village:

- Dhordo village is famour for its cultural extravaganza that showcases the region's traditional **art, music, and crafts**.
- The village is home to an annual 3-month festival called **'Rann Utsav'**.

- The **Rann Utsav** is a fun festival that takes place annually at the Rann of Kutch.
- A vibrant carnival that brims with **song, dance, culture, adventure and art**, it is said that during it, the beauty of the pristine land of Bhuj is accentuated on full moon nights.
- Golf carts, ATV rides, paintball, camel safaris, game cart excursions, paramotoring, and horse and camel rides are also a part of the celebration.

- It also hosted the **first Tourism Working Group Meeting** of **the G-20** held under India's presidency.
- **Major Art forms**:
  - **Dhamadka Block Printing**: There are many printers using **madder roots** for printing **red colour**, rusty iron solution for **black colour** and **indigo for blue colour**.
  - **Bhujodi Textile Handicrafts:** The weavers of Bhujodi are believed to be Vankars or Mughal migrants who came 500 years ago from Rajasthan.
    - They were initially engaged in weaving woollen blankets and veil cloths for the **Rabari community.**

United Nations World Tourism Organization (UNWTO):

- The **United Nations World Tourism Organization (UNWTO**), is a United Nations agency working to promote tourism for sustainable development.
- The Best Tourism Villages initiative is part of the UNWTO Tourism for Rural Development Programme.
- The programme works to foster development and inclusion in rural areas, combat depopulation, advance innovation and value chain integration through tourism and encourage sustainable practices.
- **The initiative comprises three pillars**:
  - **Best Tourism Villages by UNWTO:** Recognizes outstanding rural tourism destinations with accredited cultural and natural assets, a commitment to preserving community-based values, and a clear commitment to innovation and sustainability across economic, social, and environmental dimensions.
  - **Best Tourism Villages by UNWTO Upgrade Programme:** Supports villages on their journey to meet recognition criteria, helping in areas identified as gaps during evaluation.

- **The Best Tourism Villages Network**: a space for exchanging experiences and good practices, learning, and opportunities among its members, and it is open to contributions of experts and public and private sector partners engaged in the promotion of tourism as a driver for rural development.

11TH CENTURY SANSKRIT ALPHABET DISCOVERED IN NEELKHANTHESWAR MAHADEV TEMPLE

Context: **Recently, Indian National Trust for Art and Cultural Heritage (INTACH) has discovered a sanskrit varnamala or alphabet in devnagri on stone slab made at temple wall of Neelkhantheswar Mahadev Temple in Madhya Pradesh.**

Neelkhantheswar Mahadev Temple:

- It was built by the **Paramara king Udayaditya**. He was the son of the **great king Bhoja (1010-1050 AD).**
- In central India, it is difficult to see precisely dated temples. But the Udayeshwar temple is one of the few, which has a precise date.
- Two inscriptions engraved on the temple record the construction of temple during **Paramara king Udayaditya** between 1059 to 1080**.**

Paramara Dynasty:

- The **Paramara Dynasty** was an Indian dynasty that ruled Malwa and surrounding areas in west-central India between 9th and 14th centuries.
- They belonged to the **Parmara clan** of the Rajputs.
- The dynasty was established in either the **9th or 10th century**, and its early rulers most probably ruled as vassals of the **Rashtrakutas of Manyakheta**.
- The dynasty reached its zenith under Bhoja, whose kingdom extended from **Chittor** in the north to Konkan in the south, and from the **Sabarmati River** in the west to Vidisha in the east.

About INTACH:

- The Indian National Trust for Art and Cultural Heritage (INTACH) was founded in **1984 in New Delhi** with the vision to spearhead heritage awareness and conservation in India.
- It works on conservation and preservation of not just our natural and built heritage but intangible heritage as well.

INDIA AND ARGENTINA SIGN 'SOCIAL SECURITY AGREEMENT'

Context: **Recently, The Embassy of India has signed the 'Social Security Agreement' with Argentina, aimed at ensuring rights of the growing number of Indian nationals employed in Argentina as well as for Argentine nationals seeking employment in India.**

About the agreement:

- The 'Social Security Agreement' is aimed at ensuring rights of the growing number of Indian nationals employed in various Indian and international concerns in Argentina as well as for Argentine nationals seeking employment in India.
- The **Social Security Agreement (SSA)** between India and Argentina has created a **legal framework** which will enable professionals on both sides to claim old age and survivor's pensions.
- That apart it also safeguards "permanent and total disability pension for employed persons as well as to legislations in Argentina concerning contributory benefits of the Social Security System".
- It also takes care of factors like "**rent, subsidy and lump sum payments**" as per national laws of both countries.

Need:

- There is growing number of **Argentine nationals** who are seeking employment in India.
- This growing number of people-to-people exchanges has necessitated a legal framework to protect their rights, especially those related to social security contributions.

India-Argentina Relations:

- **Historical background:** India and Argentina have maintained diplomatic relations for over seven decades, with diplomatic ties established in 1949. The historical connections have laid the foundation for cooperation in various sectors.
- India-Argentina trade ties have been expanding in recent years covering, **IT, agriculture, and automobile and pharmaceuticals sectors.**
- India is the **4th largest trading partner** of Argentina with bilateral trade reaching 6.4 billion dollars in 2022.
- India and Argentina agreed to **exchange researchers and startups** in the field of biotechnology and agriculture.
- India and Argentina collaborate on various multilateral platforms, including the G-20 and the United Nations. They often share common perspectives on global issues like **climate change, sustainable development, and South-South cooperation.**

PROJECT UDBHAV

Context: **Recently, the Indian Army has announced an initiative, named Project Udbhav, to rediscover the "profound Indic heritage of statecraft and strategic thoughts" derived from ancient Indian texts of "statecraft, warcraft, diplomacy and grand strategy" in collaboration with the United Service Institution of India (USI).**

Background:

- The first scholarly outcome of the initiative was released titled, ***Paramparik Bhartiya Darshan... Ranniti aur Netriyta ke Shashwat Niyam,*** meant to be read by all ranks of the Indian Army in 2022.
- Recently, a panel made by the government has made discussion including a dialogue on the study of ancient texts from the **4th century BCE to the 8th century** CE, with a focus on **Kautilya, Kamandaka, and the Kural.**

About the Initiative:

- The project endeavours to explore India's rich historical narratives in the realms of **statecraft and strategic thoughts.**
- It focuses on **indigenous military systems, historical texts, regional texts and kingdoms, thematic studies,** and **intricate Kautilya Studies**.
- **Objectives:**
  - The goal is to understand the profound **depths of indigenous military systems, their evolution, strategies** that have been passed down through the ages**,** and the **strategic thought processes** that have governed the land for millennia.
  - The overall aim is to integrate **age-old wisdom** with **modern military pedagogy**.
- Significance:
  - The initiative stands testimony to the Army's recognition of **India's age-old wisdom** in statecraft, strategy, diplomacy, and warfare that seeks to bridge the historical and the contemporary.
  - By reintroducing these **classical teachings into contemporary military and strategic domains**, the Army aims to nurture its officers to apply ancient wisdom in modern scenarios and also allow a more profound understanding of **international relations and foreign cultures**.

Kautilya's Arthashastra:

- It dated from **4th to 1st century BCE**.
- It consists of fifteen books **called adhikaranas** which have sections comprising of prose **called sutra(s),** literally meaning, **thread, string or clue.**
- The first five books of the text deal with **domestic administration, and the next eight resolve the dilemmas of world affairs.**

Thiruvalluvar's Kural:

- It belongs to the **post-Sangam literature** which comprises of Eighteen Minor Works called **kilkkanakku (Subbarayalu, 2014, 46).**
- Out of these **eighteen minor works**, the Kural is considered to be a **book of lofty wisdom**.
- The term 'Kural' in the Tamil language means 'anything short', indicating brief and concise couplets of wisdom.

United Service Institution of India (USI):

- United Service Institution of India is a national security and defence services think tank based in New Delhi, India.
- It describes its aim as the "furtherance of interest and knowledge in the **art, science and literature of the defense services".**
- USI operates centers for research in various areas of national security.

During the **pre-independence period**, the USI had played a leading role in shaping the strategic thought of British Empire — not only on how to rule India but also in generating informed policy debates on its expeditionary forays in the strategic neighborhood of **Afghanistan, Tibet, China, Burma and elsewhere**.

SPECIALISED AND LOCAL LAWS (SLLS)

Context: **Tabling of the new set of Criminal Laws has brought into attention the need for enacting and reforming Special and Local Laws that can be more effective in redressing grievances.**

What is a Special and Local Law?

- **They are such** laws that applies to a particular place or especially to a particular member or members of a class of persons or things in the same situation but not to the **entire class**, and that is unconstitutional if the classification made is arbitrary or without **a reasonable or legitimate justification or basis**.

Need for enactment of new SLLs?

- SLLs provide for focused remedy to a legal grievance with a specialised approach and understanding of the issues.
- SLLs have ignited crucial debates concerning the boundaries of the state's power in criminalization, particularly with respect to individual rights and liberties.

What is the need for reform in SLLs?

- Many Special and Local Law, e.g. **Unlawful Activities (Prevention) Act (UAPA),** suffer from ambiguity and vagueness in their definition thus making their provisions uncertain.
- SLLs in some case provide for their own procedure to be followed which at times may not showcase clarity.

Statistics regarding SLLs:

In 2021, nearly **39.9%** of all cognizable offenses registered fell under SLLs, according to Crime in India Statistics.

Need of such a legislation:

- As Indian society moves ahead, the complexities in it are bound to increase, this therefore calls for more specialised laws to deal with them.
- Failing to enact SLLs and incorporate the substantive and procedural aspects of SLLs into ongoing reform efforts represents a significant limitation.

Way Ahead:

- **Clarity and Precision in SLLs:** It is essential to revisit and review existing SLLs to eliminate ambiguity and vagueness in their definitions.
  - Special attention should be given to the drafting process to ensure that the language used in SLLs is accessible and understandable to all stakeholders, including legal professionals, law enforcement agencies, and the general public.
- **Standardization of Procedures:** Establishing uniform procedural guidelines can enhance the effectiveness of SLLs and simplify the process for all parties involved**.**
- **Public Awareness and Legal Literacy:** To maximize the impact of SLLs, it is essential to invest in public awareness and legal literacy programs. These programs should aim to educate the public about their rights, obligations, and the specific SLLs that may affect them.
- **Continuous Review and Reforms:** The legal landscape is dynamic, and new challenges emerge over time. Therefore, the process of enacting and reforming SLLs should be ongoing and responsive to the changing needs of society.

ETHICS COMMITTEE OF LOK SABHA

Context: **The Lok Sabha Ethics Committee is going to take up Nishikant Dubey's complaint against Mahua Moitra in "Cash for Query" row.**

History of Ethics Committee:

- The genesis of formation of **Ethics Committee in Parliament** can be traced to a resolution adopted at the Presiding Officers Conference held in New

Delhi in October, 1996 which desired the legislatures to explore the possibility of constituting Ethics Committee.

- In pursuance of this resolution that endeavour for setting up of Ethics Committee in Indian Legislatures began in right earnest.
- It was in Rajya Sabha that such a Committee was first established.
- The Ethics Committee, Rajya Sabha, the first such Committee by any legislature in India was constituted by the Chairman, Rajya Sabha on 4 March 1997, to oversee the moral and **ethical conduct of the Members** and to examine the cases referred to it with reference to ethical and other misconduct of Members.
- In the case of Lok Sabha, a study group of the House Committee of Privileges, after visiting Australia, the UK, and the US in 1997 to look into practices pertaining to the conduct and ethics of legislators, recommended the constitution of an Ethics Committee, but it could not be taken up by Lok Sabha.
- The **13th Speaker (G. M. C. Balayogi)** constituted the First Ethics Committee of Lok Sabha on 16th May, 2000.
- **The Terms of reference of this Ethics Committee (Thirteenth Lok Sabha) were:**
  - To oversee the moral and ethical conduct of the Members; and
  - To examine the cases referred to it with reference to ethical and other misconduct of the Members.

Structure of the Ethics Committee

- The Ethics Committee in the Lok Sabha consists of **15 members**. The Speaker appoints members of the committee for one year.

The Ethics Committee in the Rajya Sabha consists of **10 members**, including its Chairman, who is nominated by the Chairman of the Rajya Sabha.

How can a complaint be filed with Committee?

- Any person can complain against a Member through another Lok Sabha MP, along with evidence of the alleged misconduct, and an affidavit stating that the complaint is not "false, frivolous, or vexatious". If the Member himself complains, the affidavit is not needed.
- The Committee does not entertain complaints based only on media reports or on matters that are sub judice. The Committee makes a prima facie inquiry before deciding to examine a complaint.
- The Committee presents its report to the Speaker, who asks the House if the report should be taken up for consideration.
- After examining a complaint, the committee makes recommendations to the Speaker of the Lok Sabha.
- Speaker may take appropriate actions, which can include issuing warnings, admonishments, or recommending the expulsion of the member from the respective house.

FRAMEWORK CONVENTION FOR THE PROTECTION OF NATIONAL MINORITIES (FCNM)

Context: **President Vladimir Putin recently introduced a bill greenlighting Russia's exit from the Framework Convention for the Protection of National Minorities (FCNM).**

What is FCNM?

- FCNM is the **world's most comprehensive legally binding treaty** devoted to safeguarding the rights of minority groups.
- FCNM was adopted by the **Council of Europe** in 1994 and ratified by Russia upon its ascension to the multinational body in February 1996.
- The convention sets out a handful of principles that the signatories are expected to follow when developing national policies toward various minority groups, including indigenous peoples, stateless minorities and minorities with national autonomy.
- FCNM is widely hailed by human rights specialists for covering a vastly diverse set of issues pertaining to minority rights, including the usage of minority languages in media and education and the **promotion and protection of minority cultures, histories, languages and religions**.

Council of Europe:

- **Founded in:** 1949
- The Council of Europe is **an international organisation** (not an EU organisation) in Strasbourg.
- All Council of Europe member states have signed up to the **European Convention on Human Rights**, a treaty designed to protect human rights, democracy and the rule of law.

What does this mean for Russia's minorities?

- Russia's policies and actions towards minorities have long contradicted some of the key principles of the Framework Convention. Among such discriminatory policies are:

- repressions against ethnic and decolonial activists
- restrictions on teaching and public usage of minority languages
- forced assimilation and discrimination of ethnic Ukrainians in Russia and the occupied Ukrainian territories

Russia is home to representatives of as many as **193 ethnic groups** who speak at least 270 languages and dialects

- The denunciation of the FCNM appears to be yet another step on the country's path toward **greater international isolation.**
- Russia's exit from the convention is a **"distressing" development** due to the mere fact that human rights defenders will no longer be able to voice their concerns in Strasbourg and consult the Council of Europe on key issues.

NATIONAL TURMERIC BOARD

Context: Recently, the Prime Minister has announced National Turmeric Board and Sammakka Sarakka Tribal University in Telangana.

About:

- The new tribal university would be named after the tribal deities **Sammakka-Sarakka.**

Sammakka and Sarakka are tribal deities who fought against the oppression of **Kakatiya rulers**.

- Also, the establishment of the **National Turmeric Board** will benefit turmeric farmers in Nizamabad district.

Nizamabad, Nirmal and Jagtial districts in the Telengana 'are known for their huge cultivation of turmeric'

Key Features of the Board:

- It is a flagship organisation for promoting turmeric across the world.
- It aims to encourage farmers from all corners of India to improve their produce in terms of quantity as well as quality.

About Turmeric:

- Turmeric (Curcuma longa) is used as **condiment, dye, drug and cosmetic** in addition to its use in religious ceremonies.
- India is a leading producer and exporter of turmeric in the world.
- **Andhra Pradesh, Tamil Nadu, Orissa, Karnataka, West Bengal, Gujarat, Meghalaya, Maharashtra, Assam** are some of the important states cultivates turmeric.

Andhra Pradesh alone occupies 35.0% of area and 47.0% of production.

- **Varieties:** A number of cultivars are available in the country and are known mostly by the name of locality where they are cultivated. Some of the popular cultivars are Duggirala, Tekurpeta, Sugandham, Amalapuram, Erode local, Alleppey, Moovattupuzha, and Lakadong.
- **Uses:**
  - Turmeric is used to flavour and to colour foodstuffs. It is a principal ingredient in curry powder.
  - Turmeric is also used as a dye in textile industry. It is used in the preparation of medicinal oils, ointments and poultice.
  - It is stomachic, carminative, tonic, blood purifier and an antiseptic. It is used in cosmetics. The aqueous extracts have biopesticidal properties.

Turmeric cultivation in India:

- Turmeric can be grown in diverse tropical conditions from sea level to 1500 m above sea level, at a temperature range of 20-35 degrees Celcuis with an annual rainfall of 1500 mm or more, under rainfed or irrigated conditions.
- Though it can be grown on different types of soils, it thrives best in well-drained sandy or clay loam soils with a pH range of 4.5-7.5 with good organic status.

Spices Board:

- Spices Board was constituted on **26th February 1987** under the Spices Board Act 1986 with the merger of the erstwhile **Cardamom Board (1968) and Spices Export Promotion Council (1960).**
- Spices Board is one of the **five Commodity Boards** functioning under the Ministry of Commerce & Industry.
- It is an **autonomous body** responsible for the export promotion of the **52 scheduled spices and development of Cardamom (Small & Large).**

RENEWAL OF MULTI-SYSTEM OPERATORS (MSOS) REGISTRATION

Context: **According to the press release by the Ministry of Information and Broadcasting, a set of new guidelines for Multi-System Operators (MSOs) were updated for curbing bureaucratic hurdles and increase transparency.**

Who are Multi-System Operators (MSOs)?

- An MSO is an operator of multiple cable television systems.
- The majority of system operators run cable systems in more than **one community** and hence most of them are multiple system operators.'

Background:

- Ministry of Information & Broadcasting (MIB) issued first of new registrations to **Multi System Operators (MSOs)** during the DAS implementation in June 2012, which became due for renewal/extension in June 2022.
- The **Cable Television Networks Rules, 1994,** however, do not mention provision about renewal of MSO registrations.

About the new guidelines:

- **Objective:** The Government is trying to take a move towards **digital processes** aligns with the government's commitment to facilitating **business operations** and reducing bureaucratic hurdles.
- **Key points:**
  - Multi system operators are now required to apply for **registration or the renewal of registration online**, utilizing the **Broadcast Seva Portal** of the government
  - MSO registrations will now be **granted or renewed** for a more extended period, specifically for ten years.
  - This alteration provides **greater stability and predictability** for cable operators, enhancing the sector's appeal for potential **foreign investments.**
  - A processing fee of **Rs. One lakh** has been established for the renewal of registration, streamlining financial transactions and ensuring adherence to regulatory requirements.
  - MSOs are required to apply for the **renewal of their registration** within a defined window, which spans from seven to two months before the current registration expires.
  - These regulatory changes signify a shift from the previous rules, where only fresh MSO registrations were considered, and there was **no specification regarding the validity period of MSO registrations**.
  - The Ministry of Information and Broadcasting has emphasized that MSOs with registrations set to expire within the **next seven months** must submit their **renewal applications online** through the Broadcast Seva Portal.
  - An additional provision has been introduced to **allow cable operators** to share their infrastructure with broadband service providers.

Significance:

- The new framework is expected to foster a **more business-friendly environment**, enticing foreign investments and encouraging growth in the **cable television sector**.
- It will contribute to **enhanced internet penetration**, especially in remote and underserved areas.
- It will also promote the efficient utilization of existing resources, reducing the need for duplicate infrastructure for broadband services.
- The guidelines align with the government's broader objectives of fostering a **digital-first economy** and expanding internet connectivity to even the remotest corners of the country.

BIHAR CASTE-BASED SURVEY

Context: **The Bihar government has released the results of its socio-economic caste survey in the State.**

Key takeaways from the survey:

- The survey puts the share of **Extremely Backward Classes (EBCs)** and **Other Backward Classes (OBCs)** cumulatively at more than 63%.
- **Category-wise classification**:
  - The "unreserved" category i.e. the "forward" castes is about **15.5%.**
  - The **Extremely Backward Classes (EBCs)** are the biggest social group comprising 36.01% of the State's population.
  - The **OBCs** accounts to 27.12%, and the **Scheduled Castes (SCs)** to 19.65%.
  - Scheduled Tribes (STs) are only 1.68%.
- **Total Population**: Bihar's population, according to the survey, is 13, 07, 25,310, compared to the 10.41 crore recorded in **the 2011 census**.

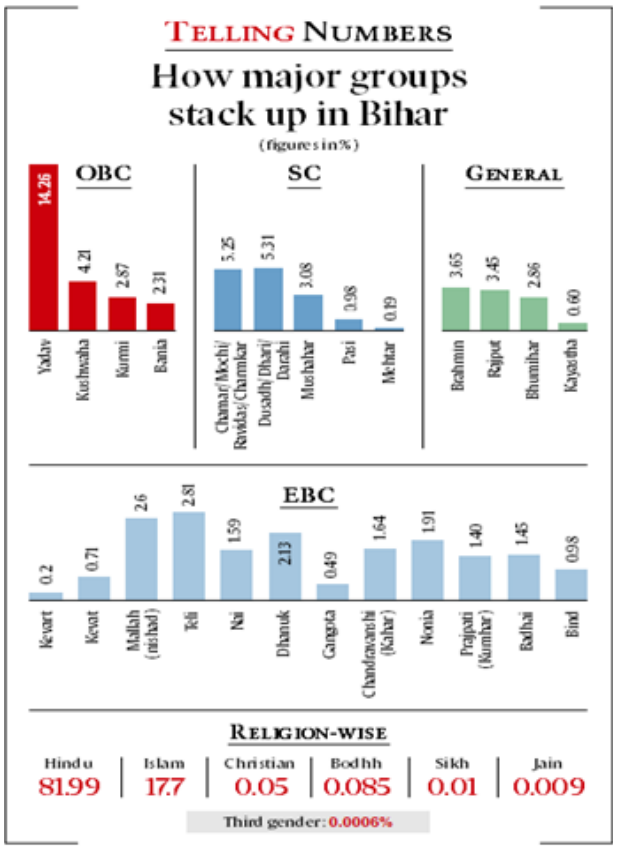
- **Religion-based data**:
  - Hindus comprise **81.99%** of the population, and
  - Muslims **17.72%.**
  - The populations of **Buddhists, Christians, Sikhs, Jains**, and other religious denominations are minuscule.

Who are EBCs?

- The EBCs are a group of **130-odd castes** that occupy the lower rungs of the OBC spectrum that is dominated by the **Yadavs and Kurmis**.
- Among the EBCs are **Mallah, Nai, Nonia, Dhanuk, Kahar, etc.**

Probable outcomes of the Survey:

- **OBC Quota Demand**: The survey's findings are likely to intensify calls for increasing the OBC (Other Backward Classes) reservation in India beyond the current 27%.



  - There's also growing demand for a separate quota within the **OBC category** for EBCs (Economically Backward Classes).
- **Sub-Categorization**: The **Justice Rohini Commission**, which has been studying sub-categorization of castes within OBCs.
  - These recommendations could become significant, and Bihar's survey might inspire other states to conduct similar studies.
- **Reservation Ceiling Debate:** The survey data could reignite the debate **about the 50% cap** on reservations set by the Supreme Court in 1992.
  - This limit was imposed to maintain administrative efficiency.

'BAIGA' TRIBAL GROUP GETS HABITAT RIGHTS

Context: **The Baiga, a Particularly Vulnerable Tribal Group (PVTG) became the second to get habitat rights in the Chhattisgarh, after the Kamar PVTG.**

What are habitat rights?

- Habitat rights recognition provides the community concerned rights over their;
  - customary territory of habitation
  - socio-cultural practices
  - economic and livelihood means
  - intellectual knowledge of biodiversity and ecology
  - traditional knowledge of use of natural resources
  - protection and conservation of their natural and cultural heritage
- These rights safeguard and promote traditional livelihood and ecological knowledge passed down through generations.
- They also help converge different government schemes and initiatives from various departments to empower PVTG communities to develop their habitats.

About Baiga PVTG:

- The Baiga community primarily resides in **Rajnandgaon, Kawardha, Mungeli, Gaurela-Pendra-Marwahi (GPM), Manendra-Bharatpur-Chirmiri, and Bilaspur districts** of the state.
- The community also lives in the adjacent districts of Madhya Pradesh.
- A total of 19 Baiga villages with a population of 6,483 people (2,085 families) have been given the habitat rights.

What does 'habitat' mean, under what law are such rights granted?

- Habitat rights are given to PVTGs under **section 3(1) (e) [rights including community tenures of habitat and habitation for primitive tribal groups and pre-agricultural communities]** of The **Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006** also known as the **Forest Rights Act (FRA).**

- According to **Section 2(h) of FRA,** "Habitat includes the area comprising the customary habitat and such other habitats in reserved forests and protected forests of primitive tribal groups and pre-agricultural communities and other forest dwelling Scheduled Tribes."

How powerful are these rights?

- Forest Rights have **legal protection** under the **Forest Conservation Act**, the **Land Acquisition law of 2013,** and even the **SC/ST Prevention of Atrocities. Act.**
- Grant of habitat rights under the Forest Rights Act provides an **additional layer of legal protection.**
- If any kind of development activity is hampering their habitat rights, the tribal group concerned can take up the matter with the administration under the Forest Rights Act, and if not resolved, **the matter can be taken to court.**

How many PVTG have recognised habitat rights?

- Out of 75 PVTG in India, only three have habitat rights.
- The Bharia PVTG in Madhya Pradesh was the first, followed by the Kamar tribe and now the Baiga tribe in Chhattisgarh.

About Particularly Vulnerable Tribal Group (PVTG)

- Tribal communities who are technologically backward, who have stagnant or declining population growth, extremely low level of literacy, and a subsistence level of economy are declared as PVTG.
- PVTGs have low health indices and largely reside in isolated, remote, and difficult areas in small and scattered hamlets/habitats.
- There are 75 PVGTs in 18 states and one Union Territory.

CENTRAL UNIVERSITIES (AMENDMENT) BILL, 2023

Context: **According to the latest update, Cabinet approved Amendment to the Central Universities Act, 2009 for setting up of Sammakka Sarakka Central Tribal University in the State of Telangana.**

About the update:

- The Union Cabinet chaired by Prime Minister gave its approval for introduction in Parliament, a Bill, namely, the **Central Universities (Amendment), Bill, 2023** further to amend the Central Universities Act, 2009 for setting up of Sammakka Sarakka Central Tribal University at Mulugu District.
- The move was taken as provided in the **Thirteenth Schedule** to the **Andhra Pradesh Re-organisation Act, 2014** as per the official announcement.
- The new university aims to increase access and improve the quality of higher education in the State and to promote avenues of higher education and advance knowledge by providing instructional and research facilities in **tribal art, culture and traditional knowledge system** for the benefit of the tribal population in the State.

Central Universities (Amendment) Bill, 2022:

The **Central Universities (Amendment) Bill, 2022** was introduced in Lok Sabha on August 1, 2022. The Bill amends the Central Universities Act, 2009, which provides for establishing **central universities in various states**. Key features of the Bill include:

- **Gati Shakti Vishwavidyalaya**: The Bill seeks to convert the National Rail and Transportation Institute, Vadodara (a deemed university) to the **Gati Shakti Vishwavidyalaya**, which will be a central university.
  - The **National Rail and Transportation Institute** was declared a deemed university under the University Grants Commission Act, 1956.
  - The Vishwavidyalaya will be sponsored and funded by the **central government** through the Ministry of Railways.
- **Scope of education**: The Bill provides that Gati Shakti Vishwavidyalaya will take measures to provide quality teaching, research, and skill development in disciplines related to transportation, technology, and management. If required, the University may also establish centres in India and abroad. According to the Statement of Objects and Reasons, establishment of the Vishwavidyalaya will address the need of trained talent in the transportation sector.
- **Appointment of a new Vice-Chancellor (VC):** The existing VC of the National Rail and Transportation Institute will hold office for:
  - Six months from when the Act is notified, or
  - Until a new VC for the Gati Shakti Vishwavidyalaya is appointed, whichever is earlier.
- **Appointment of a new Vice-Chancellor (VC):** The existing VC of the National Rail and Transportation Institute will hold office for:
  - Six months from when the Act is notified, or
  - Until a new VC for the Gati Shakti Vishwavidyalaya is appointed, whichever is earlier.

NABARD LISTS FIRST SOCIAL IMPACT BOND

Context: The National Bank for Agriculture and Rural Development (NABARD) announced the listing of its 'Social Bonds' on the Bombay Stock Exchange (BSE).

About the move:

- The National Bank for Agriculture and Rural Development (NABARD) has listed the country's first social impact bond to the tune of Rs.1, 000 crore.
- The social bonds issued by NABARD have received '**AAA' ratings from CRISIL and ICRA**, and they will be listed on the BSE (Bombay Stock Exchange).
- NABARD recently introduced a **Sustainability Bond Framework**, aimed at financing and refinancing green and social projects.
- The money will be used to support **Telangana's Jal Jeevan Mission.**

What are Social Bonds?

- Social bonds are **fixed-income securities** whose proceeds are typically earmarked to **finance or re-finance** new and existing social impact projects, especially for identified target populations such as low-income groups, unemployed, or vulnerable.
- A social impact bond (SIB) is a contract with the **public sector or governing authority**, whereby it pays for better social outcomes in certain areas and passes on part of the savings achieved to investors.
- A social impact bond is not a bond, per se, since **repayment and return on investment (ROI)** are contingent upon the achievement of desired social outcomes.
- Investing in social impact bonds has risen in recent years as a way for investors to give back to the community, as well as a way for companies to expand their social responsibility.

Need of such bonds:

- The **Environmental, Social and Governance Criteria** are three central factors that measure the sustainability and ethical impact of the company. It is to duty of the company to take care of the three central factors. The three central factors are as follows:
  - **Environmental factors** such as greenhouse gas emission, resource depletion, pollution, deforestation, climate change.
  - **Social factors** such as working conditions, health, safety, employee relations and conflict.
  - **Governance factors** such as tax strategy, donations and political lobbying, executive remuneration, bribery, corruption and structure.

Key Features of Social Impact Bonds:

- They operate over a **fixed period** of time.
- They do not provide **fixed rate of return**.
- The outcome of Social Impact bonds is completely dependent on success of social outcome.
- They are not affected by variables such as reinvestment risk, interest rate risk or market risk.
- They are **subjected to inflation risk**.
- It is hard to determine the success of Social Impact Bonds as they are based on social impacts.

Bombay Stock exchange (BSE)

- The Bombay Stock Exchange (BSE) is one of the **oldest stock exchanges in Asia**, founded in 1875.
- BSE is known for its **benchmark stock market index**, the Sensex, which tracks the performance of **30 large and well-established companies listed on the exchange.**
- BSE lists a wide range of financial instruments, including **equities, mutual funds, bonds, and derivatives,** making it a versatile platform for investors.
- BSE plays a crucial role in **regulating and supervising** the securities market in India, ensuring fair practices and investor protection.

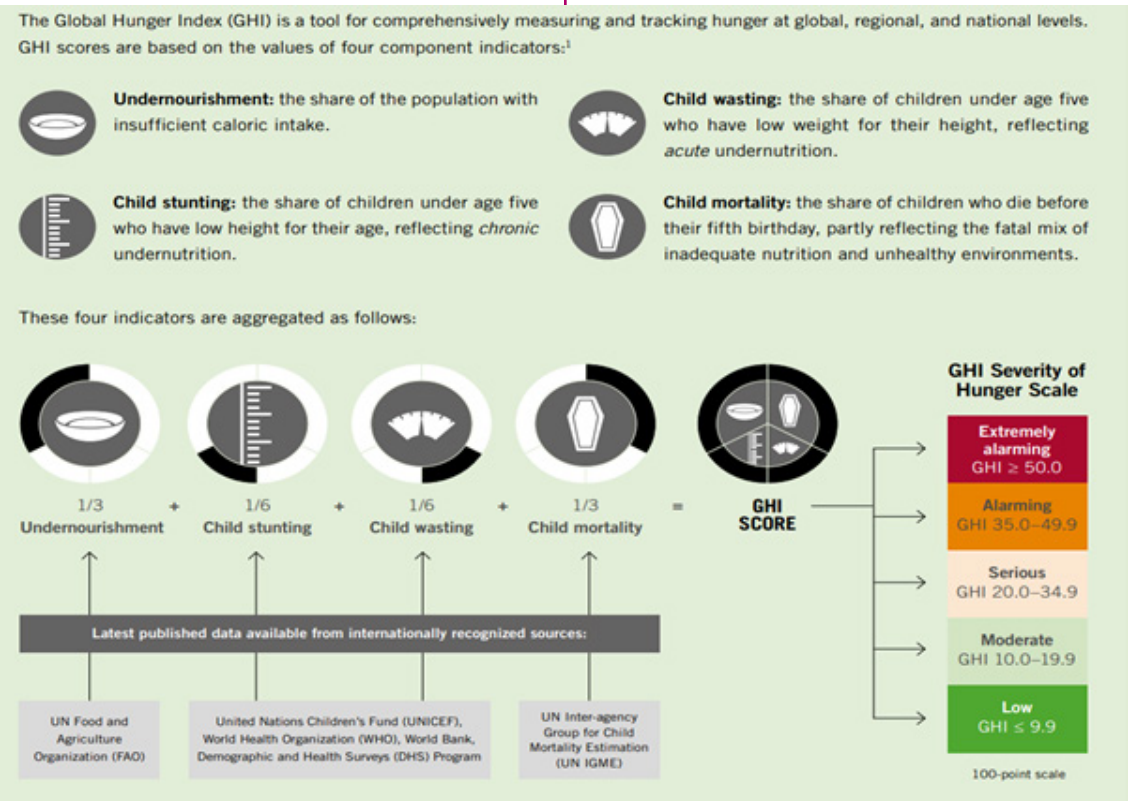
GLOBAL HUNGER INDEX (GHI) 2023

Context: India has been ranked at 111 out of 125 countries in the Global Hunger Index (GHI) 2023, further lowering its position to 107 (out of 121 countries) in 2022.

Highlights of the Index:

- **About**: The Global Hunger Index is a tool for comprehensively measuring and tracking hunger at global, regional, and national levels.
- **Indicators**: The scores are based on the values of **four component** indicators:
  - Undernourishment based on caloric intake,
  - Child (under age five) stunting based on height,
  - Child (under age five) wasting based on weight, and
  - Child mortality (before age five).

- Based on the values of the four indicators, a GHI score is calculated on a **100-point scale** reflecting the severity of hunger, where **0 is the best possible score (no hunger)** and **100 is the worst**.
- **Key points:**
  - **Performance of India**: The index has put India's child wasting rate at **18.7 per cent highest in the world** during 2018–22 reflecting acute under nutrition.
  - The rate of undernourishment in India stood at **16.6 per cent** and under-five mortality at 3.1 per cent.
  - The report also mentioned that the prevalence of **anemia in women** aged between **15 and 24 years** stood at **58.1 per cent.**
  - The overall score for India has been put at **28.7** in the ranking, which is categorized **as serious.**
  - **India's neighboring countries**: Pakistan (102), Bangladesh (81), Nepal (69th), and Sri Lanka (60), have fared better than them in the index.
  - **Global scenario**:
    - The 2023 GHI score for the world is **18.3**, considered moderate and less than one point below the world's 2015 GHI score of 19.1.
    - Since 2017, the prevalence of undernourishment, one of the indicators used in the calculation of GHI scores, has been on the rise, and the number of undernourished people has climbed from 572 million to about 735 million.
- **Concerns:** The compounding impacts of climate change, conflicts, economic shocks, the global pandemic, and the Russia-Ukraine war have exacerbated social and economic inequalities and slowed or reversed previous progress in reducing hunger in many countries.



OPERATION "KACHCHHAP"

Context: **Recently, the Directorate of Revenue Intelligence (DRI) conducted a successful operation called "Kachchhap".**

Operation Kachchhap:

- This operation resulted in the recovery of the 955 live baby turtles, including species like the **Indian Tent Turtle, Indian Flapshell Turtle, Crown River Turtle, Black Spotted/Pond Turtle, and Brown Roofed Turtle.**

- The DRI had received intelligence about a syndicate engaged in the illegal trafficking and trading of these turtles, some of which are considered vulnerable or near-threatened species according to the IUCN Red List and are protected under the **Wildlife (Protection) Act, 1972.**

About Gangetic Turtles:

- Indian Gangetic turtle has tube-like snout and incredibly flattened shell.
- They have a **round to oval,** smooth upper shell (carapace), which is olive or green in colour with a yellow border.
- The limbs are also green, while the shell on the underside of the turtle's body is grey to cream.
- It has a broad head, with several black stripes running from the centre towards the sides
- This large softshell inhabits **deep rivers, streams, and large canals, lakes and ponds with mud and sand bottoms.**
- They are mostly **omnivorous**, eating not only mollusks, insects, fish, amphibians, waterfowl and carrion, but aquatic plants as well.

Major Threats:

- Habitat loss due to the pollution, closure of canals, introduction of dams, tidal barrages, channelization, flood plain drainage and partial threats are the expansion of agriculture.
- Commercial exploitation due to professional fishing and meat consumption.
- Reduction of fish stock, as a result of overfishing.

NANOPARTICLES FROM VEHICLE FUMES CAN CAUSE ACUTE ILLNESS

Context: **As per a study, recently published in the journal 'Urban Climate' on nanoparticles, has highlighted that vehicular emissions can potentially be transported from the respiratory system to other parts of the human body, creating more chronic and acute illnesses.**

Highlights of the study:

- The study analysed nanoparticles from **10 to 1090 nanometers** in diameter, over two periods — from **April to June**, and **October to November** in 2021 in Northwest Delhi.
- The study noted that **nanoparticles in the road environment** can penetrate deeper into the respiratory system than other pollutants.
- The study also stated that in urban environments, ultrafine particles of **1 to 100 nanometers** can contribute up to **90% to the total particle number concentration**.
- Researchers found that the size of these particles varies depending on sources.
- **Source of Nanoparticles**: In urban road environments, nanoparticles come mainly from the combustion process in automobiles, the study noted, adding that the concentration of these particles in urban roadside environments varies with human activity, particularly vehicular emissions.
- Factors responsible for dispersion of Nanoparticles:
  - With rise in relative humidity, coagulation of these particles results in their concentration becoming high;
  - High concentrations of these pollutants are found during peak **morning and evening hours** due to vehicular emissions; and
  - Higher wind speed can result in dispersion of these particles.
- **Significance of the study:**
  - The **PNC (particle number concentration) estimates** will be useful to determine deposition of particles in the human respiratory system based on various inhalation rates and associated physical activities.
  - The quantitative outcomes of the present study can be used to estimate human health impacts, develop policies/standards, and initiate mitigation measures for pollution events with implications to climate change, and help move towards sustainability measures.

What are Nanoparticles?

- A nanoparticle is a small particle that ranges between 1 to 100 nanometers in size.
- Undetectable by the human eye, nanoparticles can exhibit significantly different physical and chemical properties to their larger material counterparts.
- The **European Commission states** defines that the particle size of at least half of the particles in the number size distribution must measure **100 nm or below**.
- Most nanoparticles are made up of only a few hundred atoms.

Particle-Size distribution:

Particle Type	Diameter Size Range
• Atoms and small molecules	0.1 nm
• Nanoparticles	1 to 100 nm
• Fine particles (also called particulate matter - PM2.5)	100 to 2,500 nm
• Coarse particles (PM10, or dust)	2500 to 10,000 nm
• Thickness of paper	100,000 nm

Concerns associated to Nanoparticles:

- **Natural Sources**: Nanoparticles occur naturally in the environment in large volumes. For example, the sea emits an aerosol of salt that ends up floating around in the atmosphere in a range of sizes, from a few nanometres upward, and smoke from volcanoes and fires contains a huge variety of nanoparticles, many of which could be classified as dangerous to human health.
- **Human-made (anthropogenic) sources:** Man induced nanoparticles are emitted by large industrial processes, and in modern life it is particles from power stations and from jet aircraft and other vehicles (namely, those powered by **internal-combustion engines**; car tires are also a factor) that constitute the major fraction of nanoparticle emissions.
  - Types of nanoparticles that are emitted include;
    - Partially burned hydrocarbons (in soot),
    - Ceria (cerium oxide; from vehicle exhaust catalysts),
    - Metallic dust (from brake linings), calcium carbonate (in engine lubricating oils), and
    - Silica (from car tires).

Can nanoparticles interact with living organisms?

- Nanoparticles can have the same dimensions as biological molecules such as proteins.
- In living systems, they may immediately adsorb onto their surface some of the large molecules they encounter as they enter the tissues and fluids of the body.
- This ability of nanoparticles to have molecules "sticking" to their surface depends on the surface characteristics of the particles and can be relevant for drug delivery uses.
- But the interaction with living systems is also affected by the dimensions of the nanoparticles.
- Key factors in the interaction with living structures include nanoparticle dose, the ability of nanoparticles to spread within the body, as well as their solubility. Some nanoparticles dissolve easily and their effects on living organisms are the same as the effects of the chemical they are made of.
- However, other nanoparticles do not degrade or dissolve readily. Instead, they may accumulate in biological systems and persist for a long time, which makes such nanoparticles of particular concern.

LITHIUM-ION BATTERY FIRES

Context: **The onset and intensification of lithium-ion battery fires can be traced to multiple causes, including user behavior, such as improper charging or physical damage.**

What are Lithium-ion batteries?

- A lithium-ion battery is a type of **rechargeable battery** that uses **lithium ions** as the primary component in its electrochemical system.
- It is widely used in portable **electronic devices, electric vehicles, and various energy storage applications**.
- **Basic structure:**
  - A battery is made up of an anode (a negative electrode), cathode (a positive electrode), separator, electrolyte, and two current collectors (positive and negative).
  - The electrodes are typically made of materials that can intercalate lithium ions during charging and discharging cycles.
  - Common cathode materials include lithium cobalt oxide (LiCoO2), lithium manganese oxide (LiMn2O4), and lithium iron phosphate (LiFePO4).
  - Graphite is commonly used as the anode material.

◈ **Functioning:**

- ➤ During a discharge cycle, lithium atoms in the anode are ionized and separated from their electrons.
- ➤ The lithium ions move from the anode and pass through the electrolyte until they reach the cathode, where they recombine with their electrons and electrically neutralize.
- ➤ The lithium ions are small enough to be able to move through a micro-permeable separator between the anode and cathode.
- ➤ In part because of lithium's small size (third only to hydrogen and helium), Li-ion batteries are capable of having a very high voltage and charge storage per unit mass and unit volume.

Advantages of Li-ion batteries	Disadvantages
• They have one of the highest energy densities of any battery technology today. • This means they can store a significant amount of **energy for their size and weight**. • They also exhibit a relatively **low self-discharge rate** when compared to other rechargeable batteries, allowing them to hold their charge for extended periods. • In addition, Li-ion battery cells can deliver up to 3.6 Volts, 3 times higher than other technologies. • This means that they can deliver large amounts of current for high-power applications. • Li-ion batteries have **no memory effect**, a detrimental process where repeated partial discharge/charge cycles can cause a battery to 'remember' a lower capacity. • These batteries **do not contain toxic cadmium**, which makes them easier to dispose of than Ni-Cd batteries.	• Li-ion batteries have a **tendency to overheat**, and can be damaged **at high voltages**. • In some cases, this can lead to thermal runaway and combustion. • This has caused significant problems, notably the grounding of the **Boeing 787 fleet** after onboard battery fires were reported. • Li-ion batteries require safety mechanisms to limit **voltage and internal pressures**, which can increase weight and limit performance in some cases. • Li-ion batteries are also subject to aging, meaning that they can lose capacity and frequently fail after a number of years. • Another factor limiting their widespread adoption is their cost, which is around **40% higher than Ni-Cd**.

What causes these fires?

◈ As these batteries are the powerhouses that fuel our smartphones and laptops –and has the ability to store heaps of energy in a small space.

◈ When EV batteries do overheat, they're susceptible to something called "thermal runaway".

◈ This chemical reaction can be triggered from faults in the battery – whether that's an internal failure (such as an internal short circuit), or some kind of external damage. In extreme cases, it causes the battery to catch fire or explode.

RADIATION DETECTION EQUIPMENT (RDE)

Context: **According to the latest update, Radiation Detection Equipment (RDE) will be installed at eight land crossing points along India's borders with Pakistan, Bangladesh, Myanmar and Nepal to check the trafficking of radioactive materials for its possible use in making nuclear devices.**

What is Radiation Detection Equipment (RDE)?

◈ Radiation detectors, also known as **particle detectors**, are instruments designed for the detection and measurement of subatomic particles.

◈ Radioactive materials emit subatomic particles (i.e., **electrons, protons, neutrons, alpha particles, gamma rays, and numerous mesons and baryons**) as they decay.

What is Dosimetry?

Science or technique of determining **radiation dose**; can be done in real time or retrospectively.

About the update:

◈ The RDE will be installed at the **Integrated Check Posts** and **land ports** of **Attari (Pakistan border), Petrapole, Agartala, Dawki and Sutarkandi (all on the Bangladesh border), Raxaul and Jogbani (Nepal) and Moreh (Myanmar).**

Radionuclides (or radioactive materials) are a **class of chemicals** where the nucleus of the atom is unstable.

They achieve stability through changes in the nucleus (spontaneous fission, emission of alpha particles, or conversion of neutrons to protons or the reverse).

- **Objective:** The Union government has taken the initiative to **install the RDE** so that the trafficking of radioactive materials across international borders can be checked.
- The eight ICPs are known to have a **sizeable number of cross-border movements** of people and goods.
- The RDE will be installed in a **drive-through monitoring station** that monitors trucks and their cargo.
- The RDE is equipped with raising separate **gamma and neutron radiation alarms** and generating video frames of suspected objects.
- It will also have the ability to differentiate between special nuclear material and naturally occurring radiation in **fertiliser or ceramics** as well as high-energy gamma isotopes which are **an attribute of recycled uranium.**

Applications of Radioactive Materials:

- Today, to benefit humankind, radiation is used in medicine, academics, and industry, as well as for generating electricity.
- In addition, radiation has useful applications in such areas as agriculture, archaeology (carbon dating), space exploration, law enforcement, geology (including mining), and many others.

PINK BOLLWORM THREAT FOR BT COTTON

Context: **According to a recent study, the Pink Bollworm in India has grown to become worse than the American bollworm and affecting significantly to cotton farmers.**

- This is the fourth story in a series about pink bollworm attacks on Bt cotton in the North Zone, comprising **Punjab, Haryana and Rajasthan.**

Bt Cotton introduction in India:

- Bt cotton was introduced to India in 2002 after its success in the United States and Australia in 1996.
- Before that, the **American bollworm** had become the biggest threat to cotton crops as it had developed resistance to synthetic pyrethroids, organophosphorus and carbamates (group of insecticides).
- From 1985-2002, it caused heavy economic losses to farmers in all 11 cotton-growing states of India.

What is Bt Cotton?

- ***Bt cotton*** is an insect-resistant transgenic crop designed to combat the bollworm.
- The first two generations of Bt have seen introduction of '**Cry1Ab' and 'Cry2Bc'** genes from the soil bacterium, ***Bacillus thuringiensis (Bt),*** into the cotton seed, which make the crop resistant to the attack of pink bollworm.

Pests getting resistant to Bt Cotton:

- Indian farmers have faced consistent losses of Bt cotton crops due to pink bollworm attacks since the mid-2000s, when scientists found that the insect had become resistant to the genetically modified variety of cotton.
- Bacillus thuringiensis (Bt) cotton, or Bollgard-I, was introduced to protect the crop against all three species of bollworms (American, spotted and pink bollworms) as it was encoded with Cry1Ac toxin.
- In 2005, scientists with the Indian Agricultural Research Institute started monitoring if pests were growing resistant to Bt cotton. A year later, Bt cotton was encoded with Cry2Ab gene for improved resistance against the American bollworm.
- But in 2008, researchers found unusual survival of pink bollworm in Amreli district of Gujarat, indicative of the pest's resistance to Bt cotton. Later, through scientific study, in 2009-10, scientists confirmed pink bollworm's resistance to Cry1Ac gene in four districts of Gujarat.
- In 2017-18, widespread pink bollworm infestation was reported in Maharashtra and the southern states.
- Then in 2021-22, a pink bollworm outbreak was reported in Punjab and Haryana.
- By 2023, resistant populations of pink bollworm to Bt cotton were established in the North Zone including north Rajasthan districts.

MARINE CLOUD BRIGHTENING

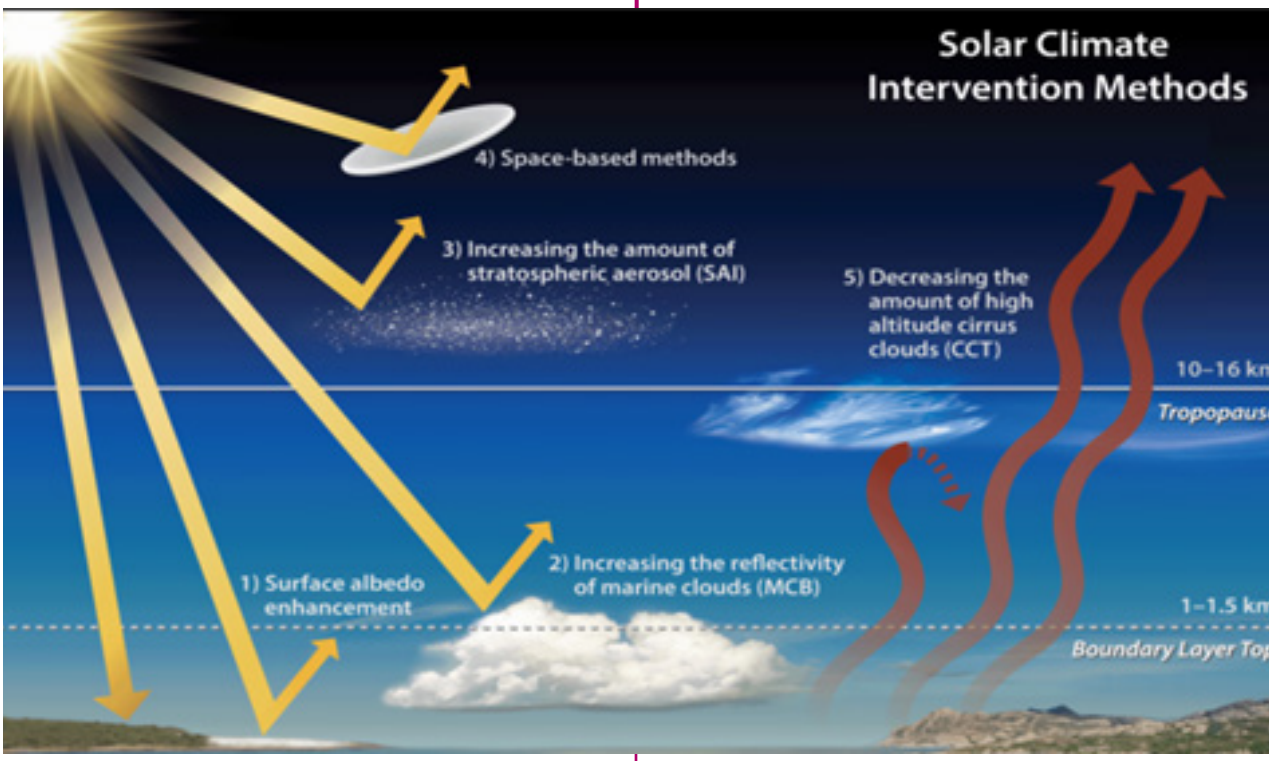
Context: **The concept of marine cloud brightening is gaining prominence recently as a tactic for addressing extreme ocean heat and as a way to reduce coral bleaching and safeguard marine ecosystems.**

About:

- The concept of cloud brightening traces back to British cloud **physicist John Latham**, who proposed this idea in 1990 as a means to control global warming by altering the Earth's energy balance.
- Latham's calculations suggested that brightening clouds over vulnerable ocean regions could counteract the warming caused by a doubling of pre-industrial atmospheric carbon dioxide.

Mechanism of Marine Cloud Brightening:

- In clean maritime air, clouds primarily form from sulphates and sea salt crystals, which are relatively scarce, leading to larger droplets with lower light reflection.
- Marine cloud brightening (MCB) seeks to boost marine cloud reflectivity (albedo), making clouds whiter and brighter.
- It involves using water cannons or specialized vessels to release fine sea water droplets into the atmosphere.
- As these droplets evaporate, they leave behind salt particles, serving as cloud condensation nuclei that foster the formation of denser, brighter clouds.



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Section D [QUICK BYTE]

- Xenophobia
- Mission Shakti 4.0
- World Organisation for Animal Health (WOAH)
- Global Terrorism Index (GTI)
- Global Innovation Index 2022
- Carbon & water found in asteroid Bennu samples
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- Nuclear-powered lander for Saturn's moon Titan
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- Madame H. P. Blavatsky

[LOCATION IN NEWS]

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- Paintbrush swift butterfly
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- New toad species

Xenophobia

In a joint declaration adopted at the P20 meet, the Speaker of Lok Sabha has condemned terrorism in all its forms including those on the basis of xenophobia, racism and other forms of intolerance, while also recognising the commitment of all religions to peace.

What does Xenophobia means?

- Xenophobia is an extreme, intense fear and dislike of customs, cultures, and people considered strange, unusual, or unknown.
- The term itself comes from Greek, where "phobos" means fear and "xenos" can mean stranger, foreigner, or outsider.

Xenophobia vs. Racism:

While xenophobia and racism often intersect, xenophobia doesn't automatically focus on the physical characteristics, behavior, or abilities of a specific group of people.

Mission Shakti 4.0

Uttar Pradesh government has launched the fourth phase of Mission Shakti, focused on promoting women's self-reliance, safety and respect.

About the Mission:

- Mission Shakti has the clear objective of empowering women through gainful activities by providing credit and market linkage.
- Empowerment of women through WSHGs under Mission Shakti is a flagship Programme of the Government.
- It envisages that over a period of time more & more women would be part of a WSHG.
- The fourth phase of the Mission Shakti aims to replicate the success of earlier phases and reach towards broader segment.
- Rallies across 75 districts have been initiated.
- The government will also honour entities and individuals demonstrating exemplary efforts in enhancing women's safety, self-reliance and respect, within their districts.

World Organisation for Animal Health (WOAH)

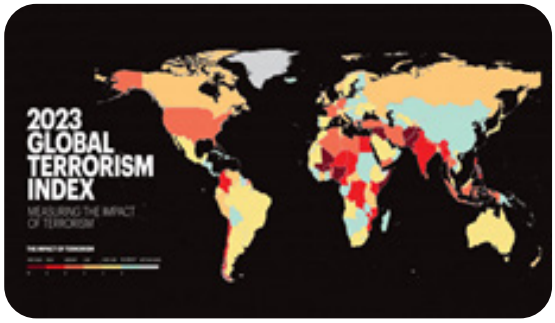
The World Organisation for Animal Health (WOAH) has approved India's self-declaration of freedom from bird flu in specific poultry compartments in Maharashtra, Tamil Nadu, Uttar Pradesh and Chhattisgarh.

About the Organisation:

- WOAH is an intergovernmental organisation responsible for improving animal health worldwide.
- It was established in 1924 in Paris as Office international des epizooties and currently has 182 member countries.
- All EU Member States are members of WOAH.
- WOAH is recognised as a reference organisation by the World Trade Organization (WTO) for international standards relating to animal health and zoonoses.

- The WTO Agreement on the application of Sanitary and Phytosanitary Measures (SPS Agreement) considers that WTO members applying WOAH Standards meet their obligations under this Agreement.
- India is one of the member countries.
- OIE develops normative documents relating to rules that Member Countries can use to protect themselves from the introduction of diseases and pathogens. One of them is the Terrestrial Animal Health Code.

Global Terrorism Index (GTI)



As per the index released recently, India has made good progress in strengthening security measures in the past few years but scaling it further would save USD 159 billion from laundering through illicit trade.

About:

- The annual Global Terrorism Index is developed by leading international think tank the Institute of Economics and Peace (IEP) and provides the most comprehensive resource on global terrorism trends.
- The GTI uses a number of factors to calculate its score, including:
  - The Number of incidences, fatalities, injuries and hostages,
  - And combines it with conflict and socio-economic data to provide a holistic picture of terrorism.

Global Innovation Index 2022

Recently, India was ranked 40th position out of 132 in **the Global Innovation Index (GII) 2022** rankings released by World Intellectual Property Organisation (WIPO).

Key highlights:

- **Most Innovative Economy**:
  - Switzerland is the most innovative economy in the world in 2022 - for the 12th year in a row - followed by the United States, Sweden, the United Kingdom and the Netherlands.
  - China is nearing the top 10 while Türkiye and India enter the top 40 for the first time.
- **Performance of India:**
  - India is the innovation leader in the lower middle-income group.
  - It continues to lead the world in ICT services exports and holds top rankings in other indicators, including venture capital receipt value, finance for startups and scale-ups, graduates in science and engineering, labor productivity growth and domestic industry diversification.
- **Increase in R & D Expenditure:**
  - The top global corporate R&D spenders increased their R&D expenditure by almost 10% to over USD 900 billion in 2021, higher than in 2019 before the pandemic.

- **Venture Capital (VC) Growth**:
  - It exploded by 46% in 2021, recording levels comparable to the internet boom years of the late 1990s.
  - Latin America and the Caribbean and Africa regions are witnessing the strongest VC growth.

Carbon & water found in asteroid Bennu samples

According to a statement by National Aeronautics and Space Administration (NASA), initial studies on the samples collected in space and recently brought back on earth have shown evidence of high-carbon content and water-bearing clay minerals.

Key findings:

- Samples collected from 4.5-billion-year-old Asteroid Bennu could indicate the building blocks of life on Earth.
- The material collected from the asteroid acts as a time capsule from the earliest days of our solar system and can help us answer big questions about the origins of life and the nature of asteroids.

Bennu is a small near-Earth asteroid that passes close to Earth every six years.

- A 4.5 billion-year-old relic of our solar system's early days, asteroid Bennu has seen it all.
- Bennu's current composition, according to scientists, was established within **10 million years** of the formation of our solar system.

Ing Makhir

Trinity Saioo, who won the 2021 Padma Shri award for helping more farmers in Meghalaya take up the cultivation of Lakadong turmeric, now plans to promote the north-eastern State's unique "Makhir" ginger.

About:

- "Sying Makhir" or "Ing Makhir" as it is locally known by the people of Meghalaya is an indigenous ginger variety native to the hilly terrains of Meghalaya.
- It is scientifically known as Zingiber rubens. This ginger is known to be the best ginger variety in India.
- The name Ing Makhir comes from the Khasi words "Sying" which means 'ginger' and "Makhir" which means 'small'. The Pnar people from the Jaintia Hills call it "Ing Traw" which, again, translates to small ginger.
- Meghalaya has two types of ginger that are popular. While "Makhir" is one, the other is "Nadia".
- The ginger is small in size but it provides immense health benefits.

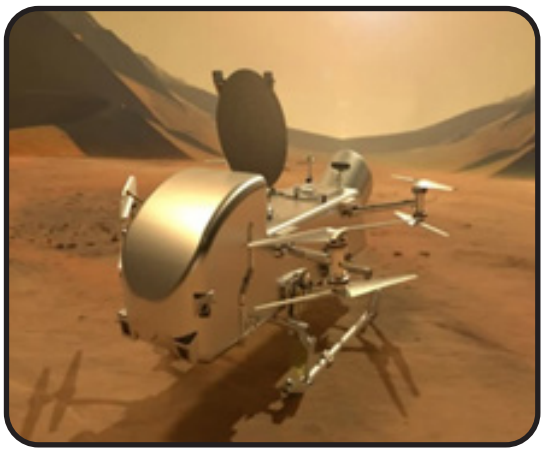
Ayyampalayam Nettai

Both the farmers and the agriculture department are striving to get the GI tag for the coconut, locally called as 'Ayyampalayam Nettai'.

About the variety:

- Ayyampalayam, a town on the way towards Marudhanidhi dam in Dindigul district of Tamil Nadu, is known for this unique variety of coconut.
- This coconut variety is grown in coconut farms just above the dam, bordering the catchment area.
- The trees are a 100-foot tall and have more than 60% oil content and an extremely sweet kernel.
- On an average, a single tree can give a yield of about 120 nuts per year without application of chemical fertilisers.
- The 'Ayyampalayam Nettai' are not just disease-resistant but also drought-resistant.

Nuclear-powered lander for Saturn's moon Titan



NASA is building a nuclear-powered lander for exploring 'Titan' — Saturn's largest moon having a dense atmosphere and low gravity.

- The Lander is a part of Dragonfly spacecraft will be launched by 2027.

About:

- Titan is a major target in NASA's quest to assess habitability and search for potential signs of life beyond Earth on worlds across the solar system.
- The lander, Dragonfly rotorcraft, is NASA's only mission to the surface of another ocean world.
- Titan is also thought to have a subsurface ocean of water.
- The lander will be equipped with cameras, sensors and samplers to help examine swaths of Titan known to contain organic materials that may have come in contact with liquid water beneath the organic-rich, icy surface.

Titan: Saturn's Largest Moon:

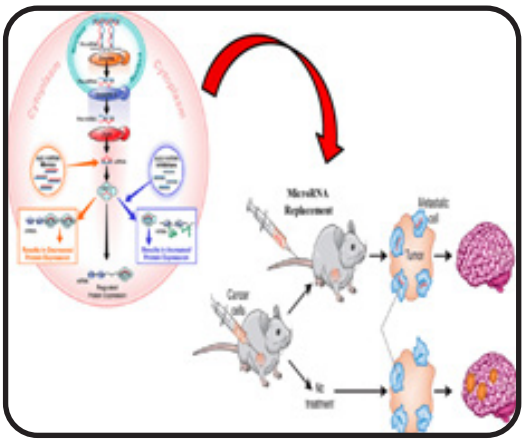
- Saturn's largest moon, Titan, is an icy world whose surface is completely obscured by a golden hazy atmosphere.
- Titan is the **second largest moon** in our solar system.
- Only Jupiter's **moon Ganymede** is larger, by just 2 percent.
- Titan is bigger than Earth's moon, and larger than even the planet Mercury.
- Titan's atmosphere is primarily nitrogen, plus a small amount of methane.

MicroRNA Therapy

A new **MicroRNA Therapy** for cancer developed by **Purdue University researchers**, attacks tumors by **tricking cancer cells** into absorbing a snippet of RNA that naturally blocks cell division.

About:

- It combines a delivery system that targets cancer cells with a specially modified version of **microRNA-34a**, a molecule that acts "like the brakes on a car," slowing or stopping cell division.



- In addition to slowing or reversing tumor growth, the targeted microRNA-34a strongly suppressed the activity of at least three genes – **MET, CD44 and AXL –** known to drive cancer and resistance to other cancer therapies, for **at least 120 hours**.

MicroRNA-34a is a short **double strand of ribonucleic acid** – a string of ribonucleic acids attached like the teeth of a zipper along the length of a sugar-phosphate chain.

The two strings of the microRNA are unevenly zipped together, with one string acting to **guide a protein complex** to the worksite in the cell while the other string is destroyed.

R21/Matrix-M malaria vaccine

The R21/Matrix-M malaria vaccine developed by the University of Oxford and the Serum Institute of India, leveraging Novavax's adjuvant technology, has been recommended for use by the World Health Organisation (WHO) after meeting required safety, quality and effectiveness standards.

About:

- The R21 vaccine is the second malaria vaccine recommended by WHO, following the RTS, S/AS01 vaccine, which received a WHO recommendation in 2021.
- Both vaccines are shown to be safe and effective in preventing malaria in children and, when implemented broadly, are expected to have high public health impact.
- Malaria, a mosquito-borne disease, places a particularly high burden on children in the African Region, where nearly half a million children die from the disease each year.

PERSONALITY IN NEWS

Matangini Hazra

Recently, the 81st Death anniversary of **Matangini Hazra** was observed, who fought and lead the Quit Indian Movement against Britishers.

About:

- Matangini was born in a village named Hogla, near Tamluk, in 1869.
- She was the daughter of a poor farmer who could not afford to provide her a formal education or raise a decent dowry.
- By the time she turned 18, **Matangini Hazra** was widowed.
- However, following her husband's death, she began devoting herself to social causes, gaining the trust and adulation of poor villagers.
- At the **age of 61**, she was arrested for taking part in the Civil Disobedience Movement in 1930.

- It was during this time that she became an active member of the Indian National Congress, and started spinning her own khadi in Gandhi's footsteps.
- Her involvement with the freedom struggle intensified during the Quit India Movement launched by Gandhi in August 1942.
- In September that year, a 73-year-old Hazra led a large procession of around 6,000 protesters, mostly women.
- The procession marched with the aim to take over the Tamluk police station from British authorities.
- In 1977, the first statue in the Kolkata Maidan dedicated to a woman revolutionary was that of Matangini Hazra.

Madame H. P. Blavatsky

The **Theosophical Society** was founded by Madame H. P. Blavatsky and Colonel Olcott in New York in 1875.

- In 1882, the headquarters of the Society were established in Adyar, near Madras (now Chennai) in India.
- Theosophy was a philosophy combining mysticism and spiritualism (with heavy influences from Buddhist and Hindu thought) with metaphysics.
- **Main objectives of the society**:
  - Promoting universal brotherhood of humanity
  - The study of comparative religion and philosophy, especially from the eastern world, and
  - To investigate unexplained laws of nature and powers latent in man.
  - Apart from spirituality, the Society encouraged reforms and framed educational schemes to work them out.
- Madam Blavatsky was believed to have had such psychic powers, including her ability to communicate through letters on an astral plane with the 'Mahatmas', who inspired the founding of the society.

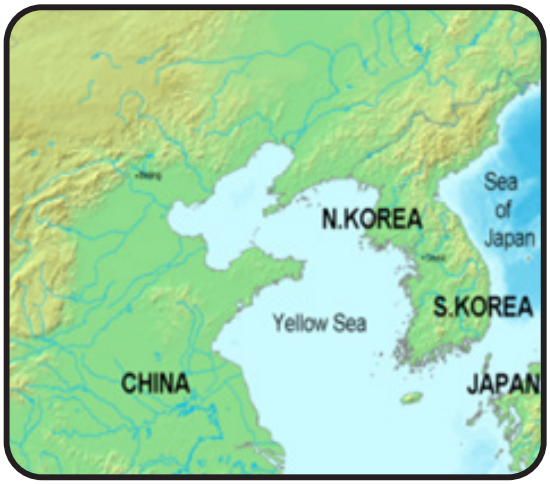
LOCATION IN NEWS

Yellow Sea

As many as **55 Chinese sailors** are feared dead after a **nuclear-powered submarine** caught itself in a '**chain and anchor**' trap in **the Yellow Sea**, located between mainland China and Korean peninsula.

About 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**.

- 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.
- Several major rivers, including the **Yellow River and the Yangtze River**, discharge into the Yellow Sea, carrying significant amounts of sediment and nutrients.
- 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).
- 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.

Haiti Islands

Kenya's Cabinet has approved the deployment of **1,000 police** to lead a multinational peacekeeping **mission to Haiti** to combat gang violence.

- From **January 1 until August 15**, more than **2,400 people** in Haiti were reported killed, more than 950 kidnapped and another 902 injured, according to the most recent U.N. statistics.

About the region:

- Haiti, country in the **Caribbean Sea** that includes the **western third of the island** of Hispaniola and such smaller islands as **Gonâve, Tortue (Tortuga), Grande Caye, and Vache.**
- The capital is **Port-au-Prince.**
- **Geographic Location**: Haiti is bordered to the east by the **Dominican Republic**, which covers the rest of Hispaniola, to the **south and west by the Caribbean**, and to the **north by the Atlantic Ocean.**

Bihar's only wetland of international importance under the Ramsar Convention lies neglected and is on the brink of drying up.

- It was declared a Ramsar site in August 2020.

About the Site:

- The lake lies in the Indo-Gangetic plains in the Begusarai district of Bihar.
- It acts as a vital flood buffer for the region besides providing livelihood opportunities to local communities.
- It is an important stopover along the Central Asian Flyway, with 58 migratory waterbirds using it to rest and refuel.
- Threats:
  - ➤ Major threats to the Site include water management activities such as drainage, water abstraction, damming and canalization.

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SPECIES IN NEWS

Damselfly

In a recent discovery that sheds light on the critical state of the planet's ecosystems, MIT-World Peace University researchers in Pune have found a damselfly of the **'Armageddon Reedtail – Protosticta Armageddonia' species.**

About

- The insect named **'Armageddon reedtail' or protosticta armageddonia**, has drawn attention due to their habitat loss.
- The newly-found species exhibits a captivating dark brown to black body with vibrant greenish-blue eyes and it features delicate pale blue markings on half of its eight abdominal segments.
- Its exclusive habitat choice is primary montane streams, where it thrives beneath a dense canopy cover.

The name, Armageddon Reedtail, is a direct reference to the concept of "Ecological Armageddon", a term used to describe the devastating decline of insect populations around the world.

Adding to the eight known species of pangolins, scientists recently discovered a ninth variety, tentatively named **"Manis mysteria".**

About:

- It is a newly discovered **Pangolin species.**
- The newly identified pangolin species emerged from a detailed study of scales seized in China's Yunnan province in 2015 and 2019.
- This new species is believed to have diverged from its Philippine and Malayan relatives approximately five million years ago.

What are Pangolins?

- They are mammals known for their distinctive appearance and protective scales.
- They are often referred to as **"scaly anteaters"** due to their characteristic scales and their diet, which primarily consists of ants and termites.
- Pangolins are found in parts of Africa and Asia and are known for their elusive nature and status as the most trafficked mammals in the world.

Scientists have recently discovered a new fish species named Badis limaakumi, from the **Milak river,** Nagaland.

About:

- It is a new badis fish species discovered in Nagaland.
- It is locally known by many names, like "**Tepdang" or "Akngashi (Chungli)" or "Aokngatsü (Mongsen)" or "Sempi" etc.**
- It appears black in its natural habitat but undergoes a remarkable color change when placed in an aquarium or different environments.
- Features:
- It has a comparatively large and slender body.
- Absence of blotches on the sides and fins, as well as on the cleithrum.
- Large number of lateral-line scales.
- Apart from channels of rivers, the edible fish are found in ditches and stagnant water bodies across India, Bangladesh, Nepal, Pakistan, Thailand and Myanmar.
- There are **26 recognised** fish species in this family.

Saltwater crocodiles (Crocodylus porosus) are also known as estuarine crocodiles.

- It is the largest of the 23 species of 'extant' or living crocodilians.
- It can also tolerate saltwater in the oceans and can travel long distances over the open ocean, making use of tidal currents.
- They are the largest living reptile, reaching up to seven metres in length.
- Location:
  - These crocodile species inhabit brackish waters of wetlands and marine intertidal environments from Sri Lanka, India, Bangladesh, and Myanmar east to the Solomon Islands and Vanuatu and south to Australia's northern coast.

Found in India:

- They are found in three locations in India — the Sundarbans, Bhitarkanika National Park and the Andaman and Nicobar Islands.
- It is one of the three crocodiles native to the Indian Subcontinent, along with the mugger crocodile (Crocodylus palustris) and the gharial (Gavialis gangeticus).

Paintbrush swift butterfly

Under the **Wild Bhattiyat Project** initiated by the State Forest Department in 2022, a species of butterfly that is rare in the western Himalayas, the paintbrush swift butterfly has been documented for the first time in **Himachal Pradesh's Chamba district**.

- It was first described by **lepidopterist Frederic Moore** more than 145 years ago.

About the Species:

- The paintbrush swift is a butterfly species of the Hesperiidae family.
- Scientific name: Baoris farri
- It is identified based on two separated spots in the upper forewing cell.
- The species' larvae feed on bamboo and some other grass species.
- Habitat: Its habitat is distributed in northeast, central and south India, and rare in Uttarakhand.
- Threats: Habitat loss and scarcity of larval host plants are major causes of the decline in the butterfly population. An increase in pesticide use, deforestation, and climate change.
- Conservation status: This species is legally protected in India under Schedule IV of the Wildlife (Protection) Act, 1972.

Arabian leopard (Panthera pardus nimr)

The Holy Land is in flames again after Palestinian group Hamas overran southern Israel from the Gaza Strip. According to the Arabian folklore, the **Arabian leopard (Panthera pardus nimr**) is found across the whole of the Arabian Peninsula.

About the Species:

- The Arabian leopard is extinct in its entire northern range, including all historic distribution ranges on the Sinai Peninsula, the Negev, and the Judaean Desert.
- Remnant nuclei of Arabian leopards are today restricted to Oman, Yemen, and possibly some animals in the southern part of Saudi Arabia.
- The Arabian leopard is the smallest leopard subspecies.
- It was tentatively affirmed as a distinct subspecies by genetic analysis of a single wild leopard from South Arabia, which appeared most closely related to the African leopard.

New toad species

A group of scientists from **India and the United Kingdom** have discovered a new species of toads, the third of a genus found only in a very narrow area in northeast India.

About the Species:

- The discovery of the new species – ***Bufoides bhupathyi*** – found in the **Dampa tiger reserve** of Mizoram was published in the latest issue of **Biodiversitas,** a journal published in Indonesia.
- The two earlier known species from;
  - The genus 'bufoides' – Bufoides meghalayanus and
  - Bufoides kempi – were found in Meghalaya.

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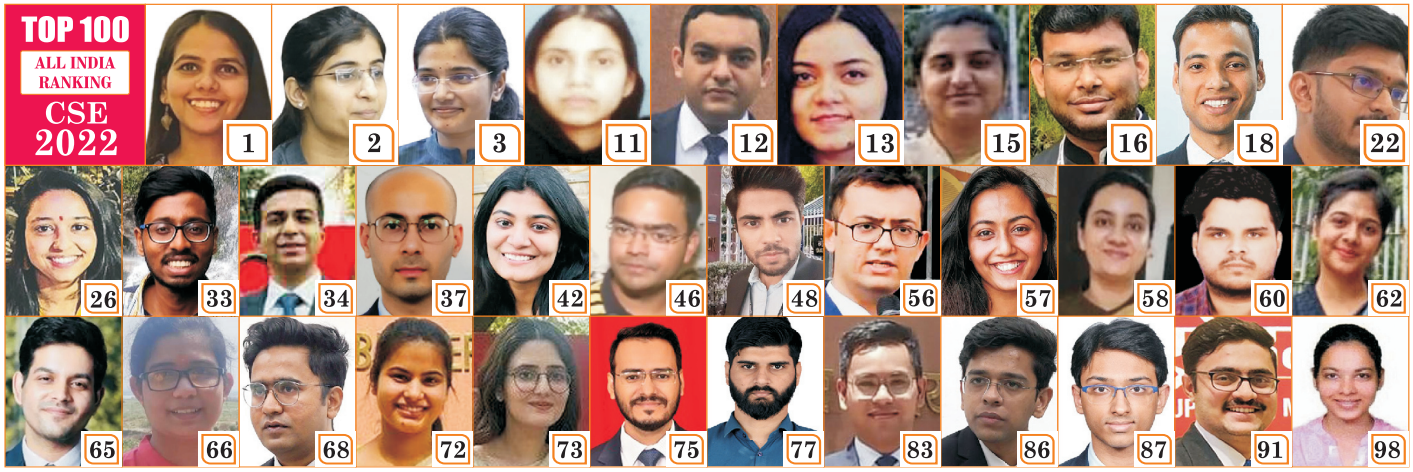
CSE RESULTS



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