Current Affairs (Consolidation)

APRIL 2024 (Part – II)

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Uncontested Electoral Victory

Why in News?

Recently, the Bharatiya Janata Party (BJP) candidate from the Surat Lok Sabha constituency in Gujarat has been **declared elected unopposed.**

➢ This follows the rejection of the nomination papers of the other candidates and the withdrawal of nominations by other candidates.

What are the Requirements for Valid Nomination?

➢ **Section 33** of the **Representation of the People Act (RPA), 1951** contains the requirements for a valid nomination.

- ○ An elector **above 25 years of age** can contest the Lok Sabha election from any constituency in India.
- ○ The proposer(s) of the candidate should be an elector(s) from the respective constituency where the nomination is being filed.
- ○ In the case of a **recognised party (national or State)**, the candidate needs to have **one proposer.**
- ○ Candidates set up by **unrecognised parties** and independents need to be subscribed by **ten proposers.**
- ○ A candidate **can file up to four nomination papers** with different sets of proposers.
  - • This is to enable the acceptance of the nomination of a candidate even if one set of nomination papers is in order.

➢ **Section 36** of the RP Act sets out the law concerning the scrutiny of nomination papers by the **Returning Officer (RO).**

- ○ It provides that the RO shall not reject any nomination for a defect that is not substantial. However, it specifies that **the signature of the candidate or proposer found not genuine** is grounds for rejection.

➢ **Section 53 (3)** of the RPA, 1951 deals with the **procedure in uncontested elections.**

- ○ According to this provision, if the number of such candidates is less than the number of seats to be filled, the RO shall forthwith declare all such candidates to be elected.

➢ The RO's actions are governed by Section 33 of the Act, which pertains to the presentation of nomination papers and requirements for a valid nomination.

What Led to Nomination Rejection in Surat Lok Sabha constituency?

➢ The candidate of the Congress party for the Surat constituency filed three sets of nomination papers.

➢ A BJP worker objected to the candidate of the Congress party, alleging that the **signatures of his proposers were not genuine.**

➢ The RO received affidavits from the proposers claiming that they had not signed the nomination papers.

- ○ As the proposers could not be produced before the RO within the stipulated **time, all three sets of nomination papers were rejected.**

➢ The nomination of the Congress party's substitute candidate, was also rejected for the same reason.

➢ This paved the way for the BJP candidate, to be **declared the winner unopposed.**

> **Note:**
> ➢ There have been at least 35 candidates who have been elected unopposed to the Lok Sabha. The majority of them were in the first two decades after independence with the last being in 2012.

What Does Legal Recourse Entail?

➢ **Article 329(b) of the Constitution** read with the RPA, 1951 provides that **no election shall be called into question except by an election petition before the concerned High Court**.

○ One of the grounds on which such an election petition can be filed **is an improper rejection of nomination papers.** Hence, the legal recourse available is to file an election petition in the Gujarat High Court.

○ The RP Act provides that **High Courts** shall endeavour to conclude such trials **within six months,** which has mostly not been followed in the past.

○ Speedy disposal of election petitions would be a step in the right direction.

> **Uncontested Elections**
>
> ➢ The ECI's handbook for returning officers states that **if only one candidate is contesting in a constituency,** they should be declared elected immediately after the deadline for withdrawal of candidature, and **a poll is not necessary in that case**. This is called Uncontested Elections.

What are the Concerns Regarding Declaring Results in Uncontested Elections?

➢ **Democratic Implications:**

○ Uncontested victories raise questions about the legality of declaring candidates elected **without a competitive electoral process**, potentially undermining the **democratic principle of representation.**

○ The system favours contesting candidates, as the RPA allows for a complete boycott to result in **zero votes for all candidates.**

○ This contradicts the idea of democracy and raises questions about potential **reforms such as introducing a minimum percentage of votes for winning candidates** or transferring uncontested seats to nominated individuals.

➢ **Voter Engagement and Choice:**

○ Uncontested elections limit voter engagement and choice, depriving constituents of the opportunity to express their preferences through the electoral process.

○ In an uncontested election, **there is a victor but no "vanquished" party.** Those who are ruled out under the Rules or voluntarily withdraw are effectively denied the opportunity to contest.

○ This process does not allow **electors to exercise the None of the Above (NOTA) option,** which was introduced to "enlighten" political parties and candidates about voters' perceptions.

● The NOTA option, however, has been criticised as a **"toothless tiger"** as it does not impact the election process in any meaningful way, despite it **receiving over 1.29 crore votes** in the last five years.

■ There are **instances where political parties received fewer votes than NOTA.**

● The EC's position is that the c**andidate with the most votes in any constituency will still be declared the winner,** regardless of the number of NOTA votes.

■ However, in Maharashtra, for local bodies' polls, **NOTA is treated as a fictional candidate**, and if **NOTA receives the highest votes, the Commission will conduct a re-poll.**

● The **Supreme Court** recently asked the **Election Commission** to respond to a **plea for fresh elections** in constituencies where NOTA received the majority of votes.

○ Under **Rule 49-O** of the Conduct of Elections Rules, 1961, electors can **choose to refuse to vote,** and the presiding officer must remark the records.

● Such an option gives the voter the **right to express his disapproval of the kind of candidates being put up by the parties.**

● There is a difference between an elector exercising Rule 49-O and one using the NOTA option.

■ In the case of the former, the likelihood of such an elector compromising his or her secrecy is high, as there is a procedure to be followed manually at a polling booth. However, in the case of the latter, there is no such issue.

<table>
<tr><td colspan="1">Parallel in Financial Rules
and Electoral Process:</td></tr>
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- The **General Financial Rules (GFRs)** that deal with the **public finances of India,** emphasise the need for a fair and transparent procedure in public procurement.
  - While the GFRs allow for a **'Single Tender Enquiry'** in certain cases like standardisation or emergencies, they also **state that lack of competition should not be determined solely by the number of bidders**.
  - Even a single bid can be **considered valid if the procurement was sufficiently advertised** and the criteria were not overly restrictive.
- This is similar to the process followed under the RPA, 1951 where electors are meant to choose from available alternatives. However, if there is only a **'single bidder' (i.e. candidate)** to represent the constituency, the **voter is effectively excluded from the choice process.**
  - This creates a dichotomy, where a **candidate with no votes can end up representing an entire constituency in Parliament.**

SC Upholds EVM and VVPAT System

Why in News?

Recently, the Supreme Court in *the Association of Democratic Reforms v. Election Commission of India Case, 2024,* upheld the **electronic voting machine (EVM) system,** rejecting a return to **paper ballots.** Also, the Court rejected the request for **100% cross-verification of EVM votes** with **Voter verifiable paper audit trail (VVPAT)** slips, maintaining the current random **5% verification** in Assembly constituencies.

- However, the Court issued a series of directions to the **Election Commission of India** (ECI) to strengthen the existing system.

What is the Supreme Court's Current Observation on EVM and VVPATs?

- **Insufficient Evidence to Question Polling System:** The Court, drawing from a range of legal precedents, emphasised that there is **insufficient evidence** to question the current polling system, particularly after the implementation of VVPATs.

  - In the 2013 case of *Subramanian Swamy v. Election Commission of India*, the Court declared that a paper trail is essential for ensuring fair elections.
  - Subsequently, in 2019, when addressing a petition advocating for a 50% cross-verification of EVM votes with VVPAT slips in each Assembly constituency, the **Court favoured increasing the number of polling stations conducting VVPAT verification** from 1 per Assembly constituency to 5.
- **Neutrality of EVM Microcontrollers**: SC observed that the microcontrollers programmed separately by **EVM manufacturers** are neutral, as they **do not favour any political party** or candidate but only record the buttons pressed by voters.
  - SC also pointed out that any unauthorised attempt to access the EVM's microcontroller or memory triggers the **Unauthorized Access Detection Mechanism (UADM),** rendering the EVM permanently disabled.
- **Security Measures in EVMs:** Highlighting the security measures, the court noted that the program installed in the EVMs is securely hashed and burned into a **One Time Programmable microcontroller chip during manufacturing**, eliminating any possibility of tampering.
  - Additionally, all three units of the EVM **– the ballot unit, control unit, and VVPAT** – have microcontrollers with firmware that cannot be altered after delivery to the ECI by the manufacturer.

How EVMs and VVPAT were Introduced in India?

- **1977-1979**: The idea of EVM was conceived in **1977** and a prototype was developed by Electronics Corporation of India Ltd (ECIL), Hyderabad, in 1979.
- **1980**: The Election Commission demonstrated an EVM on 6th August 1980. After consensus on its use, the ECI issued directives under **Article 324 for the use of EVMs.**
- **1982**: EVMswere used in 50 polling stations during elections in the **Parur seat of Kerala**. The Supreme Court ruled against the legality of EVMs' use.
- **1988**: A section of the **Representation of the People Act, 1951** was amended in december 1988 and a new section, 61A, was included in the law, empowering the **EC to use EVMs**. The amendment came into force on 15th March 1989.
- **1990:** An Electoral Reforms Committee under **Dinesh Goswami** was constituted, which recommends a technical examination of EVMs. The Technical Expert Committee recommended EVMs **"without any further loss of time marking it technically sound, secure and transparent"**.

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➢ **1998:** EVMs were used in 16 Assembly elections across Madhya Pradesh, Rajasthan and New Delhi.

➢ **2001:** State assembly elections in Tamil Nadu, Kerala, Puducherry, and West Bengal were completely conducted using EVMs. All state assembly elections thereafter witnessed the use of this machine

➢ **2004**: EVMs were used in all 543 constituencies of Lok Sabha elections.

➢ **2013**: Amendment to **the Conduct of Election Rules, 1961** introduced the use of Voter Verifiable Paper Audit Trail (VVPAT) machines. Used in the by-election for the **Noksen** assembly seat in Nagaland.

➢ **2019**: First Lok Sabha election in which EVM was fully backed by a VVPAT EVM.

How do VVPAT machines work?

When a voter presses a button in the EVM, a paper slip is printed through the VVPAT

The slip contains the poll symbol, name and serial number of the candidate

It allows the voter to verify his/her choice. After being visible to the voter from a glass screen for 7 secs, the ballot slip will be cut and dropped into the box and a beep will be heard. VVPAT machines can be accessed by polling officers only
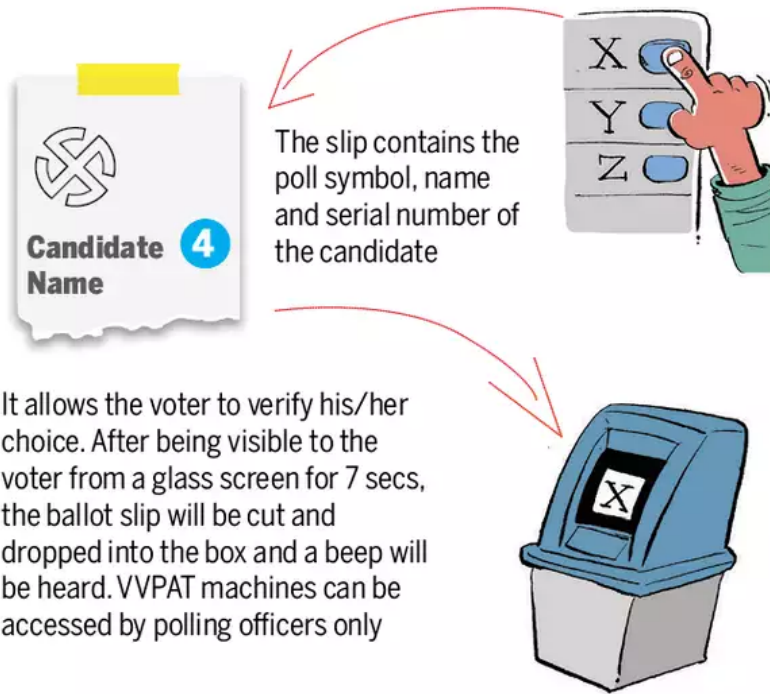
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➢ The **paper ballot system** is a traditional voting method where **voters mark their choices on physical paper ballots**, which are then manually counted by election officials to determine the results.

➢ This system is transparent but **can be time-consuming and prone to errors** during counting.

How is EVM better than the Paper Ballot System?

➢ **Accuracy and Reduced Errors:** EVMs eliminate the possibility of human errors such as miscounting, double voting, or invalid votes due to unclear markings.

  ❍ The digital nature of EVMs ensures **precise tabulation of votes**, leading to more accurate election results compared to manual counting.

➢ **Faster Counting and Results:** EVMs significantly reduce the time required for vote counting as compared to traditional paper ballots, allowing for quicker declaration of election outcomes.

  ❍ This swift counting process helps in **minimising uncertainties** and delays associated with manual counting methods.

➢ **Environmentally Friendly:** EVMs contribute to environmental sustainability by **reducing paper usage,** thus lowering the environmental impact associated with printing and managing large quantities of paper ballots.

  ❍ The shift towards electronic voting aligns with global efforts to promote eco-friendly practices in electoral processes.

➢ **Enhanced Security Measures:** EVMs incorporate advanced security features such as **encryption, secure booting, and tamper detection mechanisms,** making them less susceptible to tampering or fraud which is very likely in paper ballot systems through booth capturing, **pouring ink into ballots and ballot box stuffing.**

  ❍ The digital encryption of votes ensures the integrity and confidentiality of the electoral process, enhancing overall security and trust in election outcomes.

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ELECTORAL REFORMS IN INDIA

ELECTORAL REFORMS ARE CHANGES MADE TO IMPROVE THE ELECTION PROCESS AND ENSURE FAIRNESS.

Electoral Reforms Before 1996

- **Model Code of Conduct (1969):** Guidelines to regulate political parties and candidates prior to elections
- **61st Constitutional Amendment Act (1988):** Lowering of the voting age from 21 to 18 years
- **Electronic Voting Machines (EVMs) (1989):** Switched from individual colored ballot boxes to ballot papers, and later to EVMs
- **Booth Capturing (1989):** Provision for adjournment of poll or countermanding of elections in such cases
- **Elector's Photo Identity card (EPIC) (1993):** Electoral roll is the basis to issue EPIC to registered electors
- **ECI- A Multi-member Body (1993):** Election commissioners were appointed in addition to CEC

Electoral Reforms of 1996

- **Time-limit for By-elections:** Elections must occur within 6 months of any vacancy in a legislative house
- **Listing of Names of Candidates:** Contesting candidates categorized into 3 groups for listing
  - Recognised & registered-unrecognised political parties
  - Other (independent)
- **Disqualification for Insulting the National Honour Act, 1971:** Leads to election disqualification for 6 years upon:
  - Insulting the National Flag, Constitution of India or preventing the singing of National Anthem

Electoral Reforms After 1996

- **Vote Through Proxy (2003):** Service voters in Armed Forces & forces under Army Act can vote by proxy
- **Allocation of Time on Electronic Media (2003):** Equitable sharing of time on electronic media during elections to address the public
- **Introduction of Braille Signage Features in EVMs (2004):** To facilitate the visually impaired voters to cast their votes without an attendant

Electoral Reforms Since 2010

- **Voting Rights to Indian Citizens Living Abroad (2010)**
- **Online Enrollment in Electoral Roll (2013)**
- **Introduction of NOTA option (2014)**
- **VVPAT Voter Verified Paper Audit Trail (2013):** Introduction of VVPAT with EVMs to conduct free and fair elections
- **Photos of Candidates on EVMs and Ballot Papers (2015):** To prevent confusion in constituencies with namesake candidates
- **Introduction of Electoral bonds (2017 Budget):** An alternative to cash donations for political parties
  - Declared as unconstitutional by SC (2024)
- **Launch of Electronic EPIC (2021)**
- **Home Voting for People with Disabilities & Those Above 85 years of Age (2024)**

IMPORTANT COMMITTEES/ COMMISSION

Committees/ Commission	Year	Purpose
Tarkunde Committee	1974	By Jaya Prakash Narayan (JP) during the "Total Revolution" movement.
Dinesh Goswami Committee	1990	Electoral Reforms
Vohra Committee	1993	On the Nexus between Crime and Politics
Indrajit Gupta Committee	1998	State Funding of Elections
Second Administrative Reforms Commission of India	2007	Report on Ethics in Governance (Headed by Veerappa Moily)
Tankha Committee (Core Committee)	2010	To look into the whole gamut of the election laws & electoral reforms.

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CSDS Lokniti Survey Report 2024

Why in News?

Recently, the Lokniti programme of the Centre for the Study of Developing Societies (CSDS) conducted a Pre-Poll Study 2024 has revealed public opinion on various issues such as trust in **EVMs** and the **Election Commission of India**, and other socio-religious issues.

What are the Findings of the Lokniti Survey?

➢ **Trust of Voters in Institutions and Processes:**
- ❍ Trust in the Election Commission of India to a great extent has declined from 51% in 2019 to just **28%** in 2024.
- ❍ Around one-sixth of the respondents (**17%**) believe that there is a lot of scope for manipulation of **Electronic Voting Machines** (**EVMs**) by the ruling party.
- ❍ The respondents were more or less equally divided among those who felt that agencies **like Central Bureau of Investigation (CBI) and Enforcement Directorate (ED)** were being used for political vendetta tools and those who said that agencies are working within the contour of law.

➢ **Support for Religious Pluralism:**
- ❍ About **79%** of those surveyed believe that **"India belongs to all religions equally, not just Hindus"**, with only 11% saying that "India belongs only to Hindus".
- ❍ This belief in plurality was **more pronounced in urban areas (85% in towns and 84% in cities)** and **higher among the educated (83%)** as compared to those with no schooling (72%).

➢ **Issue of Ram Temple at Ayodhya:**
- ❍ Only 22% of the polls mentioned the construction of the Ram Mandir as the 'most liked action' of the government.
- ❍ Around 24% of the people believe that the temple issue has the potential to lead to a religious divide.

➢ **Reservation to Muslim in SC Category:**
- ❍ Around **57%** of respondents believe that the scope of the **SC** category must be expanded to provide reservation in jobs to both Hindu and Muslim Dalits.

- ● **19%** of respondents believe that only Hindus should be given reservation in the SC category.
- ❍ This support for secularised politics of social justice also confirms the recommendations made by the **Sachar Commission Report, 2006** and the **Rangnath Misra Commission Report, 2007**, which strongly assert that the **Constitution (Scheduled Caste) Order, 1950** needs to be re-read in relation to the established constitutional principles.

What are the Implications of the Findings of the Survey?

➢ **Declining Trust on EVMs and Election Machinery:**
- ❍ The poll survey brings out the people's concern and debate in recent years on declining trust on election machinery.
- ❍ It highlights the need for appropriate security measures to prevent **tampering or manipulation** of election machinery and equipment like EVM and VVPATs.

➢ **Identity Politics:**
- ❍ Survey brings out that religion is still a dominant factor in politics in India.
- ❍ Political parties in India often mobilise voters along **religious lines** to consolidate their support base, known as **identity politics.**
- ❍ The politicisation of religion can **exacerbate social tensions and instances of religious violence**, discrimination, and intolerance have occurred, fueled by political rhetoric and sectarian agendas.

➢ **Allegations on the Public Institutions:**
- ❍ There have been numerous allegations of **political interference** in the functioning of central agencies like the CBI and ED and using it as a tool against the opposition party.
- ❍ There are perceptions that central agencies may **selectively target** individuals or organisations based on political affiliations or other extraneous considerations.

➢ **Employment, Inflation and Other Issues:**
- ❍ People believe that Despite robust economic growth in recent decades, job creation has not kept pace with the expanding labour force.
- ❍ **Rising Food prices** in recent years had a significant impact on inflation in India due to the country's large population and unemployment.

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Constitutional Promise of Autonomy: Article 244(A)

Why in News?

Recently, in Assam's predominantly tribal **Diphu Lok Sabha constituency,** candidates from all political parties have pledged to implement **Article 244(A) of the Constitution,** aiming to establish an autonomous 'state within a state.'

➢ The demand for autonomy in the region dates back to the 1950s movement for a **separate hill state.**
   ○ Despite the creation of **Meghalaya in 1972,** leaders of the Karbi Anglong region opted to remain with Assam, hoping for autonomy through **Article 244(A).**

What is Article 244(A) of the Indian Constitution?

➢ **Article 244** in Part X of the Constitution envisages a special system of administration for certain areas designated as **'scheduled areas'** and **'tribal areas'.**
➢ **Article 244(A**) was added to the Constitution through the **Twenty-second Amendment Act** in 1969.
   ○ It allows Parliament to enact a law to establish an autonomous state within the State of Assam comprising **all or some of the tribal areas specified in the Sixth Schedule**.

What is the Sixth Schedule of the Indian Constitution?

➢ **About:Sixth Schedule** covers provisions relating to the administration of tribal areas in the states of **Assam, Meghalaya, Tripura and Mizoram.**
➢ **Autonomous Districts:** Tribal areas in **Assam, Meghalaya, Tripura, and Mizoram** are governed as **autonomous districts** but remain under the state's executive authority.
   ○ The governor holds the power to reorganize these districts, including **adjusting their boundaries, names**, and even dividing them into multiple autonomous regions if there are diverse tribal populations.
   ○ Acts of Parliament or state legislature might not apply directly to these districts unless adapted with specified modifications.
➢ **Autonomous District Councils:** Each autonomous district has a district council consisting of **30 members,** with 4 nominated by the governor and the remaining **26 elected through adult franchise** for a standard term of 5 years, unless dissolved earlier.
   ○ They can make laws on certain specified matters like land, forests, canal water, shifting cultivation, village administration, the inheritance of property, marriage and divorce, social customs and so on.
      ● But all such laws require the **assent of the Governor.**
   ○ They can **constitute village councils** or courts for trial of suits and cases between the tribes. They hear appeals from them.
      ● The jurisdiction of the **high court** over these suits and cases is specified by the governor.
   ○ The **governor** also has the authority to **appoint commissions to review district administration** matters and can dissolve councils based on their recommendations.

What are the Other Demands For Autonomy in India?

➢ **Gorkhaland:** The Gorkha-majority areas of Darjeeling and nearby regions in West Bengal have seen demands for a **separate state of Gorkhaland** due to **cultural and historical reasons.**
➢ **Bodoland:** In Assam, the **Bodo-majority areas** have witnessed movements for a separate state of Bodoland, citing issues of **ethnic identity and socio-economic development.**
➢ **Vidarbha:** The region of Vidarbha in Maharashtra has seen periodic demands for statehood, citing issues of **regional underdevelopment** and neglect by the state government.
➢ **Bundelkhand:** Parts of Uttar Pradesh and Madhya Pradesh comprising the Bundelkhand region have witnessed demands for a **separate state** due to perceived economic backwardness and neglect by state governments.

Social Media Regulation in India

Why in News?

Recently, the **Supreme Court of India** has raised concerns about the growing misuse of **social media** to spread **misinformation** about ongoing court cases. The court believes this "**fake news**" interferes with judicial proceedings and needs to be addressed.

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How Social Media is Regulated in India?

➢ **Information Technology Act, 2000 (IT Act):** It is the principal law that by establishing a legal foundation for **electronic governance** and governs all areas of electronic communication, including social media

   ○ **Section 69A of the IT Act, 2000** empowers Government to block information from public access under specific conditions of

      ● interest of sovereignty and integrity of India

      ● defence of India

      ● security of the State

      ● friendly relations with foreign States

      ● public order

      ● for preventing incitement to the commission of any cognizable offense relating to above.

   ○ **Section 79(1) of the IT Act, 2000** grants intermediaries (like social media platforms) exemption from liability for **third-party information**, subject to certain conditions:

      ● The intermediary's role is limited to providing access to a communication system through which third-party information is transmitted, hosted, or stored.

      ● The intermediary does not initiate or control the transmission, recipient selection, or content modification.

   ○ However, some controversial sections like **Section 66A (dealing with online content)** were struck down by the Supreme Court due to concerns about freedom of speech in *Shreya Singhal V/s Union of India Case.*

➢ **Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021:** The IT Rules (2021) mandate social media platforms to exercise greater diligence in content moderation, ensuring online safety by promptly removing inappropriate content.

   ○ Users must be educated about privacy policies, avoiding copyrighted material, defamatory content, or anything that threatens national security or friendly relations.

   ○ The **2023 Amendment** to these rules states that online intermediaries, including social media platforms like Facebook and internet service providers like Airtel, must prevent the spread of inaccurate information about the Indian government.

   ○ They should also remove content flagged as false by **fact-checking units** to maintain legal protection from third-party content.

      ● However, the implementation of amended provisions was recently halted by the Supreme Court.

What are the Impacts of Social Media on Different Sections of Society?

➢ **Youth and Students:**

   ○ **Pros:** Access to information, educational resources, networking opportunities, and platforms for self-expression and activism.

   ○ **Cons**: Risk of **cyberbullying**, distraction from studies, mental health issues due to comparison and social pressure.

      ● **Example:** Blue whale game.

➢ **Women:**

   ○ **Pros:** Social media provides a platform for women to voice their opinions, share experiences, and advocate for gender equality, women's rights, and social issues.

      ● **Example:** Me Too movement

   ○ **Cons**: Perpetuates **unrealistic beauty ideals**, leading to body image issues, self-esteem issues, harassment leading to cyberbullying and mental health concerns.

➢ **LGBTQIA+**:

   ○ **Pros:** Social media empowers LGBTQIA individuals by providing **visibility, advocacy platforms, education,** and community networking.

   ○ **Cons:** However, it also exposes them to cyberbullying, privacy risks and stigmatisation.

➢ **Businesses and Entrepreneurs:**

   ○ **Pros**: Cost-effective marketing, customer engagement, brand promotion, and access to a global market.

   ○ **Cons**: Negative feedback and public relations crises can spread rapidly, competition from online platforms, dependence on algorithms for visibility.

➢ **Government and Politics:**

   ○ **Pros:** Enhanced communication with citizens, transparency, mobilization of support for policies and campaigns.

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- ○ **Cons**: Spread of misinformation, polarisation, privacy concerns, potential for foreign interference in elections.
  - ● **Example**: Cambridge Analytica Scandal.
- ➢ **Judiciary:**
  - ○ **Pros:** Social media can enhance transparency by providing real-time updates on court proceedings, judgments, and legal developments to the public.
  - ○ **Cons:** Risk of misinterpretation or **distortion of legal information** shared on social platforms, potentially leading to misinformation.
- ➢ **Media and Journalism:**
  - ○ **Pros**: Instant news dissemination, audience engagement, citizen journalism, and diverse perspectives.
  - ○ **Cons**: Fake news and misinformation challenges, loss of traditional revenue models, **echo chambers affecting objectivity**.
- ➢ **Elderly and Less Tech-Savvy Individuals:**
  - ○ **Pros:** Connectivity with family and friends, access to information and services.
  - ○ **Cons:** Digital divide, susceptibility to online scams and misinformation, privacy concerns due to lack of technical knowledge.

Issue of Reservation for Muslims in Andhra Pradesh

Why in News?

Recently, the issue of the 5% quota given to Muslims in Andhra Pradesh in 2004 has resurfaced, reigniting the debate regarding the religion-based reservation.

What is the Background of the Reservation for Muslims in Andhra Pradesh?

- ➢ **About:**
  - ○ In Andhra Pradesh, where Muslims constitute about 9.5% of the population, certain Muslim groups are already included in the **state OBC lists**, with quotas ranging from 7% to 10%.
    - ● However, there has been a push to include all Muslims in the OBC category, following the models of Karnataka and Kerala.

- ➢ **Reservation in 2004:**
  - ○ In June 2004, the government examined the **socio-economic and educational status** of Muslims in the state for inclusion in the OBC list, leading to a **5% reservation** under **Articles 15(4**) and **16(4)**.
  - ○ However, the Andhra Pradesh **High Court** struck down the quota for being implemented without being referred to the **Backward Classes Commission** and for not excluding the **creamy layer.**
    - ● Court held that the **muslim community cannot be considered as a homogenous group.**
    - ● One of the key questions before the court was whether Muslims, as a group, are **entitled to affirmative action** within the constitutional framework, which the **court ruled affirmatively**, stating that such reservations **do not violate secularism.**
- ➢ **Reservation in 2005:**
  - ○ The **Backward Classes Commission** recommended providing reservations to the **entire Muslim Community**, stating that they are socially, educationally, and economically backward.
  - ○ The state government again introduced an **Ordinance** granting a 5% quota to Muslims, which was subsequently replaced with legislation.
  - ○ The High Court once again **struck down the quota**, stating that the Commission did not rely on **objective criteria** *(M. Nagaraj v. Union Of India, 2006)* to conclude that Muslims as a group were backward in Andhra Pradesh.
  - ○ The ruling was challenged before the **Supreme Court**, which in 2010 directed to **maintain the status quo** till the issue was heard.
- ➢ **Current Status:**
  - ○ The final hearing in the Supreme Court was scheduled for 2022. However, the SC decided to hear the case after the **Economically Weaker Section (EWS)** quota issue was decided.
  - ○ The EWS quota was cleared in November 2022, but the AP quota issue is **yet to be heard.**
- ➢ **Issues With Andhra Model of Reservation:**
  - ○ Considering muslims as homogenous group violates **principle of equality** in the **Constitution's Basic Structure.**
  - ○ It also violates the **constitutional prohibition** on granting reservations based **solely on religion (Articles 15(1) and 16(2)).**

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○ The High Court observed that Andhra Pradesh's reservation quota, already at 46% under Articles 15(4) and 16(4), **breached the 50% limit** with the addition of a 5% quota for Muslims, questioning the lack of compelling reasons for this breach.

Similar Religion-based Reservation in Other States

➢ **Kerala:** Provides an 8% Muslim quota within its 30% OBC quota.

➢ **Tamil Nadu and Bihar:** Also Include Muslim caste groups in their OBC quota.

➢ **Karnataka:** Had a 4% sub-quota for Muslims within the 32% OBC quota.

○ State government in 2023 redistributed this sub-quota among **Vokkaligas and Lingayats.**

➢ **Recent Issue of Karnataka:**

○ **National Commission for Backward Classes (NCBC)** has summoned the **Chief Secretary** of the Karnataka government regarding the categorisation of the Other Backward Classes (OBC) quota in Karnataka, specifically addressing the issue of **"blanket reservation" for Muslims under Category II-B.**

○ **Current Status:** Karnataka categorises Muslims under **Category II-B** of the OBC categorisation, in addition to 17 Muslim castes in **Category I** and 19 Muslim castes in **Category II-A.**

○ **NCBC's Concern:**

● NCBC questions the need for a separate category for Muslims and doubts the **validity of reports** justifying their backward classification.

● NCBC asserts that **Muslims in Karnataka are being over-represented** in postgraduate medical admissions due to their categorisation within the OBC quota.

● NCBC is concerned that **allowing all Muslims to contest from any OBC or General category seat in local body elections** may deprive other deserving OBC communities of opportunities.

○ Karnataka Government's Justification:

● The Karnataka government justified categorising Muslims under Category II-B by considering them as **neither caste nor religion** but as backward classes, as recommended by various State Commissions.

What are Various Legal Provisions Related to Reservation?

➢ **Constitutional Provision:**

○ **Article 16(4)** of the Constitution allows for reservation for "backward class of citizens." **States** have the **discretion** to determine which communities qualify as backward.

● To qualify for reservations in educational institutions under **Article 15**, a group must **first demonstrate its social and educational backwardness,** and for reservations in public employment under **Article 16(4)**, the authorities must establish both the backwardness of the group and its inadequate representation in government employment.

➢ **Major Supreme Court's Judgements:**

○ *The State of Madras v. Smt. Champakam Dorairajan Case, 1951:*

● Struck down reservations in educational institutions based solely on caste.

● Led to 1st Amendment of the constitution.

○ *Indra Sawhney v. Union of India Case, 1992:*

● Defined limitations on reservations:

■ Creamy layer exclusion

■ 50% quota limit

■ No reservations in promotions (except SC/ST).

○ *M. Nagaraj v. Union Of India Case, 2006:*

● Upheld Art. 16 (4A allowing reservations for SC/ST in promotions)

● Established 3 conditions for such policies:

■ Social and Educational Backwardness

■ Inadequate Representation

■ Maintaining Efficiency

○ Jarnail Singh vs Lachhmi Narain Gupta Case, 2018:

● Creamy layer exclusion applies to SC/ST in promotions

● No need for quantifiable data on backwardness for SC/ST promotions

○ *Janhit Abhiyan vs. Union of India, 2022:*

● **Supreme Court** has upheld the validity of the **103rd Constitutional Amendment** which provides **10% reservation** for the **Economically Weaker Sections (EWS)** among forward castes in government jobs and colleges across India.

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What are the Arguments Related to Religion-based Reservation in India?

➢ **Arguments in Favour of Religion-Based Reservations in India:**
   ○ **Socio-Economic Backwardness:** According to the **Sachar Committee Report,** Muslims in India lag behind other communities in terms of socio-economic indicators such as education, employment, and income.
      ● Reservations can help in bridging this gap.
   ○ **Constitutional Mandate:** The Indian Constitution provides for affirmative action for socially and educationally backward classes irrespective of the **religious** and **cultural** denomination.
   ○ **Ensuring Adequate Representation:** Reservations can ensure **adequate representation of** underrepresented religious groups in employment, education, and other fields.

➢ **Arguments Against Religion-Based Reservations in India:**
   ○ **Secularism:** Critics argue that providing reservations based on religion goes **against the principle of secularism** enshrined in the Indian Constitution, which advocates **equal treatment** of all religions by the state.
   ○ **Undermining National Unity:** Religion-based reservations could undermine national unity as it could lead to **resentment and division** among different communities.
   ○ **Economic Criteria:** Reservations should be based solely on economic criteria rather than religion, to ensure that benefits reach those who are truly economically disadvantaged, irrespective of their religion.
   ○ **Administrative Challenges:** Implementing reservations based on religion could pose **administrative challenges**, such as determining the criteria for identifying beneficiaries and **preventing misuse** of the system.

Engaging India's Youth in Voting

Why in News?

As India gears up for the **18th Lok Sabha elections,** a concerning trend emerges, the **reluctance of the country's youngest eligible voters to participate.**

Why are India's Youngest Voters Hesitant to Participate?

➢ **Historical Trends:**
   ○ **Less than 40% of voters between 18 and 19 have registered** for the 2024 elections, raising concerns about youth engagement in the electoral process.
      ● Lowest enrollment rates in Delhi, Bihar, and Uttar Pradesh.
   ○ Despite exposure to political voices via social media, many young people seem hesitant to participate actively in voting, **despite their passion for social action and protests.**
   ○ Bihar reports only 9.3 lakh enrolled out of a potential 54 lakh (17%), despite being known for its youthful population.
   ○ Similar trends are observed in other states like Delhi, Uttar Pradesh, and Maharashtra, where enrollment rates remain notably low.

➢ **Lack of Political Education:** Many young people feel that the **education system does not adequately prepare** them to understand the political process and its significance.
   ○ Insufficient education on the importance of civic engagement and voting.
      ● Lack of critical thinking skills and political awareness in school curriculum.

➢ **Absence of Youth-Centric Agendas**: Political parties often fail to advocate agendas that resonate with the younger demographic, leading to a disconnection.
   ○ Political parties may often overlook key issues that are of significant concern to the younger demographic, such as job opportunities , and affordable higher education.

➢ **Inadequate Representation:** Despite forming a significant portion of the population, youth are often underrepresented in political decision-making bodies.
   ○ This lack of representation can lead to policies that do not adequately address the needs and concerns of young people.

➢ **Lack of Engagement:** Limited opportunities for meaningful participation in the political process.
   ○ Disillusionment with **top-down decision-making** and governance structures.

Note:

➢ **Social Pressures:**
- ○ Social pressures, including **stereotypes** and negative perceptions, can discourage youth from engaging in politics.
- ○ Instead of focusing on meaningful agendas, there's **often an emphasis on money and muscle power in politics.**
- ○ This can divert attention from genuine political activism and hinder youth participation in bringing about meaningful change.

➢ **Disconnect from Issues:**
- ○ Feeling disconnected from political issues that **directly affect their lives and communities.**
- ○ **Perceived irrelevance of political decisions** to their immediate concerns and priorities.

➢ **Technological Influence:**
- ○ Over Reliance on social media for information, **leading to misinformation and superficial engagement** with political issues.

How Voter Disinterest Puts Democracy at Risk?

➢ **Disenfranchisement:**
- ○ Disenfranchisement refers to the **deprivation of voting rights,** often resulting from legal barriers, thereby impeding citizens' ability to participate in the democratic process.
  - ● Many migrants face disenfranchisement due to their inability to travel to polling stations where they are registered as voters, as required by law. While it is possible to register to vote at a new location, doing so requires proof of a fixed address, which many of the poor do not have.
- ○ **Social disenfranchisement during elections** persists despite **constitutional guarantees (article 326)** that hinder equitable participation in the electoral process.

➢ **Undermining Democratic Principles:**
- ○ Voter disinterest challenges the core principle of democracy, which **thrives on active citizen participation in the electoral process.**
- ○ When citizens disengage from voting, they relinquish their role in collective decision-making, eroding the foundation of democratic governance.

➢ **Perpetuating Exclusion:**
- ○ Disinterested voters **allow a minority to dictate the course of governance,** leading to a cycle of exclusion for marginalised communities.
- ○ Lack of voter participation perpetuates **inequality and injustice,** as the voices of underrepresented groups go unheard in policymaking.

➢ **Questioning Legitimacy:**
- ○ Low voter turnout raises questions about the legitimacy of electoral outcomes, **undermining public trust in the democratic process.**
- ○ When a significant portion of the population abstains from voting, the mandate of elected representatives may be called into question, casting doubt on the credibility of democratic institutions.

What are the Voter Rights and Responsibilities in Elections?

➢ **Voter Enrollment and Rights:**
- ○ **Eligibility:**
  - ● In India, the Electoral Roll updates quarterly, allowing registration in the quarter they come of age of 18. Eligible youth receive an Electors Photo Identity Card(EPIC) upon registration.
    - ■ This applies to those reaching 18 by 1st January, 1st April,1st July, or 1st October.
- ○ **One Place Registration:** Voters can be enrolled only at one place, multiple registrations are an offence.
- ○ **Alternative ID:**
  - ● Having a voter ID or **Election Commission of India** prescribed document doesn't guarantee voting. The name must be on the electoral rolls and a valid ID is required to cast a vote.
  - ● Voters can use their **Electors Photo Identity Card (EPIC)** or other documents specified by the Commission at polling station.
    - ■ **A ration card is not a valid identification for voting.**
    - ■ Alternative documents include an **Aadhaar card,MNREGA job card,** driving licence, **PAN card,** a smart card from **Registrar General and Census Commissioner,** passport, pension document with photo, identity card from the government agency, or an MLA/MP identity card.

Note:

➢ **Disqualification from Voting Process:**
- ❍ Individuals who are convicted of offences committed under **Section 171E** (which deals with bribery) and **Section 171F** (which deals with personation or undue influence at an election) of the **Indian Penal Code** are disqualified from participating in elections.
- ❍ Those convicted of offences under Section 125 (which deals with various electoral offences), Section 135 and Section 136 of the **Representation of the People Act, 1951** face disqualification **from elections**.
- ❍ If an individual votes in more than one constituency, his vote is disqualified.

➢ **Voting Process:**
- ❍ **Wrong Button:**
  - If a wrong button is pressed on an **Electronic Voting Machine (EVM)**, approach the polling officer for a reset and let you vote again.
- ❍ **Refusal to Vote:**
  - Electors can refuse to vote even after registering their identities before the presiding officer and reaching the polling booth.
  - The **NOTA (None Of The Above) option allows voters to express a lack of confidence in any candidate,** while the **'refusal to vote' option allows an elector to shun the entire poll process.**
- ❍ **Unauthorised Voting:**
  - Voters can still vote if someone else has already voted in their name by using a **"Tendered Ballot Paper" according to Rule 49P of the Conduct of Elections Rules.**
  - The Presiding Officer will collect and keep the tendered ballot paper separate.
- ❍ **Proxy Voting:**
  - **Service voters with service qualifications,** such as members of the armed forces, Government employees posted outside the country, and members of the armed police force of a State, can use the proxy voting facility.
  - They can appoint a proxy, who must be a **resident of the same constituency, to vote on their behalf.**
- ➢ **Vote from Home:**
  - The **ECI** introduced home voting for the elderly and **Persons with Disabilities (PwDs) in the 2024 Lok Sabha elections,** allowing those above 85 years of age and **PwDs** with 40% benchmark disability to avail of this facility.

➢ **Reporting Malpractices:**
- ❍ Report violations anonymously using the **cVIGIL citizen mobile app** to capture images or videos of malpractices you witness.
  - The ECI guarantees a response within 100 minutes, specifying the action taken.
  - The app allows users to report violations, track location via GPS, capture live incidents, monitor complaint status, and report violations anonymously.

National Human Rights Commission (NHRC)

Why in News?

Recently, **NHRC** convened a meeting of all seven **national commissions** to discuss protecting the rights of **vulnerable sections**, aiming to share best practices and collaborate on implementation strategies.

➢ The seven bodies include **National Commission for Women (NCW)**, **National Commission for Scheduled Caste (NCSC)**, **National Commission for Scheduled Tribe(NCST)**, **National Commission for Protection of Child Rights (NCPCR)**, **National Commission for Minorities (NCM)**, **National Commission for Backward Classes (NCBC)**, **Chief Commissioner for Persons with Disabilities**.

What are the Outcomes of the Joint Sitting of Human Rights Bodies?

➢ **Joint Strategies for Effective Implementation:**
- ❍ NHRC emphasised the need for **collaboration** among all seven national commissions to frame **joint strategies** for **effectively implementing** existing legislations and schemes to protect human rights.
- ❍ NHRC highlighted the importance of learning from each other's experiences to ensure equality and dignity for **SC-ST communities**, **women**, and marginalised sections of society.

➢ **Mechanical Cleaning of Septic Tanks:**
- ❍ NHRC also stressed the importance of mechanically cleaning **septic tanks** and urged states and local bodies to follow the **NHRC's advisory** on this matter.

➢ **Collaboration for Research:**
- ❍ There should be collaboration among all commissions for research to **avoid duplication of efforts.**
- ❍ The common subjects of research between **NHRC** and the **National Commission for Women (NCW)** were highlighted and it was emphasised the need

Note:

for compatibility of state statutory provisions to ensure uniformity in property rights for women.

➤ **Challenges in Education and Technology:**
○ The Chairperson of the **National Commission for Scheduled Caste** discussed the challenge of ensuring the equatable benefits of the **new education policy** and emerging technology reach the people.
○ He emphasised that change in mindset cannot be brought by laws alone but also requires **compassion and sensitivity.**
○ Delays in compensation under the **SC and ST Act** were highlighted, along with the need to review victim compensation schemes in all states.

➤ **Rights of Children:**
○ The Chairperson of the **National Commission for Protection of Child Rights (NCPCR)** highlighted the proactive work of the commission in ensuring the rights of children.
● The commission has been monitoring eight portals and has ensured the rehabilitation of over one lakh **orphan children.**
● It has also issued guidelines and SOPs for the protection of child rights.
○ Enhanced compensation under **National Legal Services Authority (NALSA)** and the state obligation to intervene in child rights violations in private schools were also emphasised.

➤ **Challenges Faced by Persons with Disabilities:**
○ **Chief Commissioner for Persons with Disabilities** said over the years with the increase in rights consciousness among 'divyangjan', so have the related challenges.
● E.g: The visually-impaired have been facing the problem of captcha codes while accessing online services.

➤ **Scope for Cooperation and Structured Approach:**
○ It was agreed upon that there is a need to advocate for **enhanced cooperation** among **commissions** and a **structured approach** to safeguarding societal rights, emphasising the value of institutional interactions, **collaborative advisories**, and utilising the **'HRCNet portal'** for **synergy and efficiency.**
● **HRCNet** is a **web based online portal**, provides a **centralised approach** to **handle complaints**, received from aggrieved citizens.

What is the National Human Rights Commission (NHRC)?

➤ **About:**
○ It ensures the **protection of rights related to life, liberty,** equality, and dignity of individuals.

○ Rights guaranteed by the Indian Constitution and international covenants enforceable by Indian courts.

➤ **Establishment:**
○ Established on 12th October 1993, under the **Protection of Human Rights Act (PHRA), 1993.**
○ Amended by the Protection of Human Rights (Amendment) Act, 2006, and Human Rights (Amendment) Act, 2019.
○ Established in conformity with the Paris Principles, adopted for promoting and protecting human rights.

➤ **Composition:**
○ The Commission consists of a **chairperson**, five full-time Members and seven deemed Members.
○ Chairman is a former **Chief Justice of India** or a **Supreme Court judge.**

➤ **Appointment and Tenure:**
○ Chairman and members appointed by the **President** on the recommendations of a six-member committee.
○ The committee consists of the Prime Minister, the Speaker of the **Lok Sabha**, the Deputy Chairman of the **Rajya Sabha**, leaders of the Opposition in both Houses of Parliament, and the Union Home Minister.
○ The chairman and members hold office for a term of **three years** or until they reach the age of 70.

➤ **Role and Function:**
○ Possesses powers of a **civil court** with judicial proceedings.
○ Empowered to utilise the services of central or state government officers or investigation agencies for investigating human rights violations.
○ Can investigate matters within one year of their occurrence.
○ Functions are primarily recommendatory in nature.

What are the Shortcomings in Functioning of NHRC?

➤ **Non-Binding Nature of Recommendations:**
○ Although the NHRC investigates human rights violations and provides recommendations, it **cannot compel authorities** to take specific actions. Its influence remains largely moral rather than legal.

➤ **Inability to Punish Violators:**
○ The NHRC lacks the authority to punish violators. Despite identifying perpetrators of human rights abuses, the NHRC **cannot directly impose** penalties or award relief to victims. This limitation undermines its effectiveness.

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- ➢ **Limited Role in Armed Forces Cases:**
  - ○ The NHRC's jurisdiction over human rights violations by armed forces is restricted. Cases involving military personnel often **fall outside the NHRC's purview**, hindering comprehensive accountability.
- ➢ **Time Limitations in Case of Historical Human Rights Violations:**
  - ○ The NHRC cannot consider violations reported after one year. This limitation prevents the NHRC from addressing **historical or delayed human rights** grievances effectively.
- ➢ **Resource Constraints:**
  - ○ The NHRC faces **resource shortages.** With a high caseload and limited resources, the NHRC struggles to handle investigations, inquiries, and public awareness campaigns efficiently.
  - ○ Several state human rights commissions are working without their chief, and like the NHRC they are also going through shortage of staff.
- ➢ **Lack of Independence:**
  - ○ The NHRC's composition relies on government appointments. Ensuring complete independence from political influence remains a challenge**, affecting its credibility.**
- ➢ **Need for Proactive Interventions:**
  - ○ The NHRC often responds reactively to complaints. A more **proactive approach,** including preventive measures and early intervention, could enhance its impact.

What are the Steps Need to be Taken to Strengthen Working of NHRC?

- ➢ **Improve the Scope and Effectiveness:**
  - ○ **Broaden** the NHRC's **mandate** to address emerging human rights challenges effectively. **For example Artificial Intelligence, Deep Fake, Climate Change etc.**
- ➢ **Granting Enforcement Powers:**
  - ○ Empower the NHRC with **punitive powers** to enforce its recommendations. This would enhance accountability and compliance.
- ➢ **Composition Reforms:**
  - ○ The current composition **lacks diversity**. Appoint members from civil society, activists, and experts to ensure a holistic perspective.
- ➢ **Developing an Independent Cadre:**
  - ○ The NHRC faces **resource constraints.** Establish an independent cadre of staff with relevant expertise in human rights issues.

- ➢ **Strengthening State Human Rights Commissions:**
  - ○ State Human Rights Commissions need support. Facilitate collaboration, capacity building, and knowledge sharing among state commissions.
- ➢ **Advocacy and Public Awareness:**
  - ○ Reactive responses may limit the impact. Engage in **proactive advocacy,** awareness campaigns, and education to empower citizens about their rights.
- ➢ **International Cooperation:**
  - ○ India can benefit from international experiences. Collaborate with **international human rights bodies**, learn from their practices, and adopt relevant strategies.

Electoral Reforms in India

Why in News?

With India's ongoing **General Elections 2024**, there's a spotlight on **past electoral reforms,** from the founding of the **Election Commission** to the introduction of **Electronic Voting Machines** and recent changes in the procedure for appointment of election commissioners.

- ➢ These reforms reflect the continuous evolution and enhancement of India's electoral system, capturing the essence of democratic progress.

What are the Key Electoral Reforms Enacted in India?

- ➢ **Foundation of Election Commission and First General Election:** The Election Commission of India was founded on **25th January 1950**, under the leadership of **Sukumar Sen (**originally the commission had only a Chief Election Commissioner**).**
  - ○ Inaugural General Election held from **October 1951 to February 1952**, marking the participation of 17.5 crore voters amidst logistical hurdles.
  - ○ Despite an illiterate electorate and refugee populations, India embraced **universal suffrage for citizens above 21 years.**
- ➢ **Lowering of Voting Age:** The **61st Constitutional Amendment Act of 1984** reduced the **voting age from 21 years to 18 years** for the Lok Sabha as well as the assembly elections.
  - ○ This was done to provide the unrepresented youth of the country an opportunity to express their feelings and help them become a part of the political process.

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➢ **Deputation to Election Commission:** In 1985, a provision was made that the officers and the staff engaged in the preparation, revision and correction of electoral rolls for elections are **deemed to be on deputation to the Election Commission** for the period of such employment.

  ❍ These personnel, during that period, would be under the control, superintendence and discipline of the Election Commission.

Election Commission of India (ECI)

About
- **Autonomous Constitutional Authority** - Administers Union/state election
  ○ LS, RS, State LA, the offices of the President and VP
- Estd - **25th Jan1950** (National Voters' Day)

Constitutional Provisions
Part XV - Article 324 to 329

VOTE

Structure
- 1 Chief Election Commissioner and 2 Election Commissioners **appointed by President**
- **Tenure- 6 years, or up to the age of 65 years,** whichever is earlier
- Retiring ECs – **eligible for further appointment by the govt.**
- **Removal of CEC-** Resolution on the **ground of proven misbehaviour or incapacity,** with majority of 2/3rd members present and voting, supported by more than 50% of the total strength of the house

Major Roles and Responsibilities
- Determining Electoral Constituencies
- Preparing/Revising electoral rolls
- Notifying the schedules and dates of elections
- **Registering political parties and granting them the status of national or state parties**
- Issuing the Model Code of Conduct (MCC) for political parties
- Advising the President on **matters concerning the disqualification of MPs**

Challenges
- Truncated Tenure of CEC
- Executive Influence in Appointments
- Dependence on Centre for Finance
- Lack of Independent Staff

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Note:

- **ECI as Multi-Member Commission:** The Election Commission of India (ECI) became a Multi-Member Commission for the first time in **1989**.
  - On 1st January 1990, the positions of these additional election commissioners were abolished.
  - However, the ECI became a three-member body again on **1st October 1993** (with one Chief Election Commissioner and two election commissioners), which remains the structure today.
- **Transition to Ballot Papers from Coloured Ballot Box:** In the early years of Indian elections, **individual coloured ballot boxes were used for each candidate.**
  - Voters would cast their votes by dropping paper ballots into the respective boxes, a method that required meticulous counting and posed challenges in preventing fraud and manipulation.
  - The **introduction of ballot papers marked a crucial step towards streamlining the voting process.**
    - Voters would mark their preferences on paper ballots, which were then collected and counted manually.
    - While this **method improved vote counting accuracy**, it still had limitations such as potential errors and delays in announcing results.
- **Electronic Voting Machines:** In 1989, a provision was made to facilitate the use of **Electronic Voting Machines (EVMs)** in elections.
  - The EVMs were used for the first time in 1998 on experimental basis in selected constituencies in the elections to the Assemblies of Rajasthan, Madhya Pradesh and Delhi.
  - The EVMs were used for the first time in the **general elections (entire state) to the Assembly of Goa in 1999.**
  - They are indigenously designed, developed and manufactured by **Bharat Electronic Ltd. and Electronics Corporation of India Ltd.** under technical guidance of the Election Commission's Technical Expert Committee.
- **Provision Against Booth Capturing:** In 1989, a provision was made for adjournment of poll or countermanding of elections in case of booth capturing. **Booth capturing** includes:
  - seizure of a polling station and making polling authorities surrender ballot papers or voting machines
  - taking possession of polling station and allowing only one's own supporters to exercise their franchise
  - threatening and preventing any elector from going to polling station
  - seizure of the place being used for counting of votes.
- **Model Code of Conduct (MCC)**: T.N. Seshan's tenure as CEC was one the most influential periods for the ECI, marked by his efforts to enforce the **Model Code of Conduct (MCC)** with greater efficacy.
  - Originating in Kerala in 1960, the MCC initially comprised basic 'Dos and Don'ts.'
  - By **1979**, the ECI, in collaboration with political parties, expanded the code, including measures to curb the misuse of power by the ruling party for unfair advantages in elections.
  - It was also during his tenure that **electors' photo identity cards (EPICs)** were introduced in 1993.
- **Allocation of Time on Electronic Media:** Under a 2003 provision, the Election Commission should **allocate equitable sharing of time on the cable television** network and other electronic media during elections to display or propagate any matter or to address the public.
- **Restrictions Imposed on Exit Polls:** According to a **2009 provision**, conducting exit polls and publishing results of exit polls would be prohibited during the election to **Lok Sabha and State Legislative Assemblies.**
  - **"Exit-poll" is an opinion survey regarding how electors have voted at an election** or how all the electors have performed with regard to the identification of a political party or candidate in an election.
- **Online Enrolment in the Electoral Roll:** In 2013, a provision was made for online filing of applications for enrolment in the electoral roll. For this purpose, the Central Government, after consulting the Election Commission, made the rules known as the **Registration of the Electors (Amendment) Rules, 2013.**
- **None of the Above Option:** The Supreme Court directed the Election Commission to include the **None of the Above (NOTA) option** in ballot papers and EVMs, allowing voters to abstain from voting for any candidate while maintaining ballot secrecy.
  - NOTA was introduced in elections **in 2013**, ensuring voters' right to abstain from voting discreetly.
- **Voter-Verifiable Paper Audit Trail System:** ECI started exploring the possibility of introducing a **Voter-Verifiable Paper Audit Trail (VVPAT) system** to increase transparency and verifiability in the poll process.

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- In 2011, a prototype was developed and demonstrated before the ECI and its expert committee.
- In August 2013, the Central government notified the amended **Conduct of Elections Rules, 1961,** enabling the ECI to use VVPAT with EVMs.
- The VVPAT was used with EVMs for the first time in a **bye-election** from the 51-Noksen Assembly Constituency of **Nagaland.**

Note:

    As per Indian Statistical Institute (ISI) calculations, even **counting slips from 479 randomly selected VVPATs across the country would guarantee over 99% accuracy.**

➤ **Appointment of Election Commissioners:** Previously, the chief election commissioner and election commissioners were appointed by the President on the recommendation of the central government.

- However, in March 2023, the Supreme Court in *Anoop Baranwal vs Union of India Case* highlighted the recommendations from the **Dinesh Goswami Committee on Electoral Reforms (1990)** and the **Law Commission's 255th report on Electoral Reforms (2015).**
  - Both committees suggested a committee comprising the **Prime Minister, Chief Justice of India (CJI), and the Leader of the Opposition** for appointing the CEC and ECs.
- The recent **CEC and Other ECs (Appointment, Conditions of Service and Term of Office) 2023** supersedes the Election Commission Act, 1991 covering the appointment, salaries, and dismissal procedures for the CEC and ECs.
  - Under the new law, the President appoints them based on recommendations from a **Selection Committee** comprising the **Prime Minister, a Union Cabinet Minister, and the Leader of the Opposition** or the leader of the largest opposition party in the Lok Sabha.

What are the Key Committees Related to Electoral Reforms?

➤ **Dinesh Goswami Committee** on Electoral Reforms (1990)

➤ **Vohra Committee** on Crime-Politics Nexus (1993)

➤ **Indrajit Gupta Committee** on State Funding of Elections (1998)

➤ **Second Administrative Reforms Commission** Report on Ethics in Governance (2007) headed by **Veerappa Moily**

➤ **Tankha Committee (Core Committee)** on Election Laws and Reforms (2010)

Indelible Ink- Symbol of Indian Elections

➤ The **indelible ink**, a symbol of Indian elections, is used to prevent multiple voting. It contains **silver nitrate** and remains visible even after exposure to soap or liquids for up to 72 hours.

➤ The ink, initially made by the **Council of Scientific & Industrial Research (CSIR)** and patented by the National Research Development Corporation, is now solely produced by **Mysore Paints & Varnish Ltd., a prominent undertaking of Govt. of Karnataka** and exported to over 25 countries.

Note:

➤ EVMs and VVPATs are designed and manufactured indigenously by **Bharat Electronic Limited (BEL)**, a PSU under the Defence Ministry, and the **Electronic Corporation of India Limited (ECIL),** another PSU under the Department of Atomic Energy.

Ayushman Bharat Health Accounts

Why in News?

    Ayushman Bharat Health Accounts (ABHA) has emerged as a transformative force, aiming to revolutionise healthcare access and data management across India.

What is ABHA?

➤ **About:** ABHA is a unique **14-digit number** used to link all the health records of a person. ABHA intends to create a digital health ecosystem & aims to promote digitisation of healthcare.

- Any individual can enroll in **Ayushman Bharat Digital Mission (ABDM)** to generate a Health ID or ABHA, free of cost.

➤ **Features:**

- **Electronic Health Records (EHR)**: ABHA integrates electronic health records, facilitating the storage and retrieval of patient information.
  - This helps in maintaining medical histories and streamlining healthcare delivery.

○ **Portability**: The accounts are designed to be portable across various healthcare providers empanelled under the **Ayushman Bharat Scheme,** allowing beneficiaries to access services seamlessly, regardless of their location.

○ **Transparency and Accountability**: By promoting digital transactions and maintaining electronic records, ABHA enhances transparency and accountability in the healthcare system.

What is Ayushman Bharat Yojna?

➤ **Ayushman Bharat Yojana**: Also known as the Pradhan Mantri Jan Arogya Yojana (PMJAY), it is a flagship scheme of the Government of India that was launched in September 2018 as recommended by the **National Health Policy 2017**, to achieve the vision of **Universal Health Coverage (UHC).**

➤ **Ayushman Bharat Digital Mission (ABDM):** It aims to develop the backbone necessary to support the integrated digital health infrastructure of the country and bridge the existing gap amongst different stakeholders of the Healthcare ecosystem through digital highways.

What are the Other Recent Government Initiatives Related to Healthcare?

➤ **Health and Wellness Centres:** In February 2018, the Government of India announced the creation of Health and Wellness Centres (HWCs) by transforming existing Sub Centres and Primary Health Centres as the base pillar of Ayushman Bharat.

○ These centres would deliver **Comprehensive Primary Health Care (CPHC)** bringing healthcare closer to the homes of people covering both maternal and child health services and non-communicable diseases, including free essential drugs and diagnostic services.

➤ **Janaushadhi Kendra:** It ensures quality generic medicines available at affordable prices to all citizens.

➤ **eSanjeevani: eSanjeevani** - the **National Telemedicine Service of the Ministry of Health** and Family, Government of India has evolved into the world's largest documented telemedicine implementation in primary healthcare.

○ It has digitally brought health services to the masses in rural areas and remote communities.

Passport Revocations of Goans

Why in News?

Recently, a **memorandum** issued by the **Ministry of External Affairs (MEA)** has led to the **revocation of passports** of more than 100 people from Goa in the past few months.

➤ These people, who may not have known about the memorandum, are accused of **hiding important information** when they tried to surrender their passports after becoming citizens of Portugal.

Why are the Passports Being Revoked?

➤ **Goan's Portuguese Connection:**

○ Goa is a former **Portuguese colony**, which was under Portuguese rule for approximately 450 years, **from 1510 to 1961.**

○ According to **Portuguese law:**

● Those born in Goa **before 19th December 1961** (the day Goa was liberated from Portuguese rule) **and two future generations** have the option to register as Portuguese citizens.

● Many Goans have transcribed their births in the **Central Registry in Lisbon** and acquired Portuguese citizenship.

● A Portuguese passport provides **visa-free entry** to several countries, including the UK and the **European Union.**

● The allure of **overseas employment** and educational opportunities has driven Goans to seek Portuguese citizenship.

➤ **The 2022 Memorandum of MEA:**

○ The MEA issued a **memorandum** on 30th November 2022, specifically addressing the "surrender of Indian passport on account of acquisition of foreign nationality by an erstwhile Indian citizen."

○ The memorandum categorizes cases related to passport surrender certificates, and one particular category has resulted in the revocation of passports for some Goans.

● Under **section 10 (3) (b) of the Passport Act of 1967,** passports obtained by hiding the fact of having another country's **citizenship** can be cancelled even if they were not used for travel.

○ Before this MEA memorandum, **passport authorities used to impose a penalty for surrendering an Indian passport** and issuing a surrender certificate, which was declared invalid by a 2020 Kerala **High**

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Court judgment, stating that **passport authorities cannot impose penalties but can only prosecute for violations of the Passports Act.**

➢ **Revocation of Pasport and Issue of OCI Card:**
○ **Dual Citizenship:** Since India does not allow **dual citizenship**. Therefore, Goans acquiring official Portuguese passports must relinquish their Indian citizenship.
○ **OCI Status:** The **revocation of Indian passports** has left these individuals unable to apply for **Overseas Citizenship of India (OCI).**
  ● A **'surrender certificate'** issued by passport-issuing authorities has so far been a requirement for those who want to apply for **OCI cards.**
    ■ However, on account of the **revocation of their passport,** these **individuals couldn't avail this option.**
  ● Current memorandum of MEA, instructing passport authorities to issue **'revocation certificates'** instead of **surrender certificates** in cases where Indian passports were obtained by concealing information.
    ■ This will allow Indian nationals from former Portuguese territories who acquired Portuguese citizenship to apply for **Overseas Citizenship of India (OCI).**
○ OCI status **permits foreign citizens** of Indian origin to live and work in India indefinitely.

Portuguese Rule in Goa

➢ Goa, situated on the west coast of India, was a Portuguese colony from **1510 to 1961.**
➢ The small coastal area was **conquered by Afonso de Albuquerque** and became a vital trade hub for the Eastern spice trade.
➢ Remarkably, Goa served as the capital of the entire Portuguese Empire east of the Cape of Good Hope for 450 years.
➢ In the 1940s, as India moved closer to independence from British rule, the fight for freedom in Goa began.
➢ Finally, on 19th December 1961, more than four centuries after its colonisation, Goa was freed from Portuguese rule.

What is Overseas Citizenship of India (OCI) Card?

➢ **About:**
○ The concept of OCI was introduced in response to demands for **dual citizenship** by the **Indian diaspora**, particularly in developed countries.
○ The **Ministry of Home Affairs** defines an OCI as a person who:

● was a **citizen of India** on or after 26th January 1950; or
● was eligible to become a citizen of India on 26th January 1950; or
● is a **child or grandchild of such a person,** among other eligibility criteria.
○ According to **Section 7A of the OCI card rules**, an applicant is not eligible for the OCI card if he, his parents, or grandparents have ever been a **citizen of Pakistan or Bangladesh.**
○ The Government of India via the **Citizenship (Amendment) Act, 2015,** merged the **Person of Indian Origin (PIO) category with the OCI category** in 2015.

➢ **Historical Background:**
○ The **OCI Card scheme** was launched during the **Pravasi Bharatiya Divas**in 2005.
○ It was introduced as an **acknowledgement** of the persistent emotional attachment of the Indian diaspora to their country of origin and to acknowledge role of diaspora in nation's development.

➢ **Benefits of the OCI Card:**
○ Multiple entry, multi-purpose lifelong visa to visit India.
○ **Exemption** from registering with the **Foreigners Regional Registration Office** (FRRO) regardless of the duration of their stay.
○ Parity with Non-Resident Indians (NRIs) in financial, economic, and educational fields.

➢ **Limitations and Restrictions:**
○ They do not have the right to vote.
○ They cannot purchase agriculture or farmland.
○ All activities except **research work** for which special permission is required from the Indian Mission/ Post/ FRRO concerned.
○ Holders **cannot participate** in elections or hold public office, reflecting the government's stance on maintaining clear boundaries between citizenship and overseas citizenship.

➢ **Current Scenario:**
○ The OCI card scheme has been a key element of the Indian government's effort to deepen its relationship with its diaspora.
○ As of March 2020, the Ministry of Home Affairs had issued over 3.5 million OCI cards.
  ● The vast majority were issued to foreign nationals in the United States, United Kingdom, Australia, and Canada.

Note:

PIO VS OCI

A PERSON OF INDIAN ORIGIN (PIO)

➤ Means a **foreign citizen** (except a national of Pakistan, Afghanistan Bangladesh, China, Iran, Bhutan, Sri Lanka and Nepal)

➤ **A foreign citizen** whose one of the parents/ grandparents/ great grandparents was **born** and a **permanent resident** of India

➤ Who is a **spouse** of a citizen of India or a PIO

BENEFITS

1. PIO card holders **do not require a visa to visit India** for a period of 15 years from the date of issue of the PIO card.

2. They are **exempted from registration at FRRO/ FRO** if their **stay does not exceeds 180 days**, In case if the stay exceeds 180 days, they shall have to register with FRRO/ FRO within the next 30 days

3. They **enjoy parity with NRIs in economic, financial** and **educational benefits**

4. All **future benefits** that **would be exempted to NRIs** would also be available to the **PIO card holders**

OVERSEAS CITIZEN OF INDIA (OCI)

A **foreign national**, who was **eligible** to **become citizen of India** on **26.01.1950** or was a citizen of India on or at anytime after **26.01.1950** or belonged to a territory that became part of India after **15.08.1947** is **eligible for registration as Overseas Citizen of India** (OCI). Minor children of such person are also eligible for OCI. However, if the applicant had ever been a citizen of Pakistan or Bangladesh, he/she will not be eligible for OCI.

BENEFITS

OCIs are **entitled to a multipurpose, multiple entry, lifelong visa** allowing them to visit India at any time, for any length of time and for any purpose

➤ **Exempted from police reporting** for any length of stay in the country

➤ **Have also been granted all rights in the economic, financial and education fields in parity with NRIs** except, the right to acquisition of agricultural or plantation properties

Disaster Relief Funds From the Centre

Why in News?

Recently, the Tamil Nadu Government has filed a suit at the **Supreme Court** claiming that the Centre is withholding **National Disaster Relief Funds (NDRF)**, after **Cyclone Michaung** and consequent **Floods** hit the state in December 2023.

➤ Earlier the Karnataka government had also filed a plea with the apex court, claiming that the **Centre is denying disaster relief funds** that are necessary to aid drought-affected areas in the state.

How are States Assisted During a Natural Disaster?

➤ States receive assistance **during natural disasters through various mechanisms** established under the **Disaster Management Act, 2005**.
  ○ This legislation defines a disaster as any significant event, whether natural or **man-made, causing substantial loss of life**, human suffering, property damage, or environmental degradation beyond the community's coping capacity.

➤ The Act established the **National Disaster Management Authority (NDMA)**, along with **State Disaster Management Authorities (SDMAs)**.
  ○ These entities work in conjunction with **district-level authorities to form an integrated disaster management** system in India.

➤ Funds for disaster relief are available **to states from two sources** — the **State Disaster Relief Fund (SDRF)** and the National Disaster Relief Fund (NDRF).
  ○ These funds were created with the enactment of the Disaster Management Act, 2005 (DMA), following the **devastating tsunami of December 2004.**

How are Funds Released to States from the NDRF?

➤ **National Disaster Relief Fund:**
  ○ **National Calamity Contingency Fund (NCCF)** was renamed as National Disaster Response Fund (NDRF) with the enactment of the **Disaster Management Act, 2005.**
    • It is defined in **Section 46 of the Disaster Management Act, 2005 (DM Act).**
  ○ It is managed by the **Central Government to meet the expenses for emergency response**, relief and rehabilitation due to any threatening disaster situation or disaster.

Note:

- It supplements the **SDRF** in case of a disaster of a severe nature, provided adequate funds are not available in the SDRF.
- ➢ **Fund Released to States:**
  - ❍ **NDRF Guidelines:** As per the **January 2022 Operational Guidelines** for Constitution and Administration of the NDRF, funding has been allocated for the NDRF from the **fiscal year 2021-22 until 2025-26.**
  - ❍ **Assistance Request from the NDRF:** In instances where a state lacks adequate funds in the SDRF and has experienced a national calamity beyond its coping capacity, **it can request assistance from the NDRF.**
  - ❍ **Evaluation of the Situation:** The Ministry of Home Affairs (MHA) or the Ministry of Agriculture will evaluate the situation and **decide on the need for additional assistance** from the NDRF, following a specified process outlined in the guidelines.
  - ❍ **Formation of Inter-Ministerial Central Team (IMCT):** This process entails the immediate formation of an IMCT by the MHA to assess the **affected areas and recommend whether additional funds** are necessary.
    - Subsequently, a sub-committee of the National Executive Committee, composed of relevant central ministry secretaries, will **determine the amount of funding available.**
  - ❍ **High-Level Committee:** Ultimately, a high-level committee chaired by the Home Minister, along with the Ministers for Agriculture and Finance, and the vice-chairman of **NITI Aayog**, will authorise the release of **NDRF funds based on the recommendations provided.**

What is the State Disaster Relief Fund?

- ➢ **About:**
  - ❍ SDRF has been constituted under **Section 48 (1) (a) of the Disaster Management Act, 2005.**
    - It was constituted based on the recommendations of the 13th **Finance Commission.**
  - ❍ It is the primary fund available with the State governments for responses to notified disasters to meet expenditure for providing immediate relief.
  - ❍ It is audited by the **Comptroller and Auditor General of India (CAG)** every year.

- ➢ **Contribution:**
  - ❍ The **Centre contributes 75% of the SDRF** allocation for general category States and Union Territories and **90% for special category States** and Union Territories (northeastern States, Sikkim, Uttarakhand, Himachal Pradesh, Jammu and Kashmir).
- ➢ **Disaster (s) Covered under SDRF:**
  - ❍ **Cyclones**, drought, **earthquakes**, fire, **flood**, **tsunami**, hailstorms, **landslides**, avalanches, cloudbursts, pest attacks, frost and **cold waves**.
- ➢ **Local Disasters:**
  - ❍ A State Government **may use up to 10% of the funds available under the SDRF** for providing immediate relief to the victims of natural disasters that they consider to be **'disasters' within the local context in the State** and which are not included in the notified list of disasters of the Ministry of Home Affairs.

Right to Protection from Climate Change Impacts

Why in News?

Recently, the **Supreme Court of India** acknowledged the **right to protection from climate change impacts** as part of **the fundamental rights to life** (Article 21) **and equality** (Article 14) enshrined in the Indian Constitution.

- ➢ This ruling came during a case concerning the conservation of the **Great Indian Bustard** and the **Lesser Florican**.
- ➢ SC noted that the intersection of climate change and human rights has been put into sharp focus in recent years.

Where Climate Change and Human Rights Intersect?

- ➢ **Right to Life and Livelihood:** Climate change can directly affect people's right to life by causing extreme weather events like **hurricanes or floods,** which can lead to loss of life and property.
  - ❍ For example, in low-lying coastal areas, **rising sea levels due to climate change** can threaten people's homes and livelihoods, forcing them to relocate.
- ➢ **Access to Clean Water and Sanitation:** Climate change can impact water sources, leading to **water scarcity or contamination.**
  - ❍ This affects people's right to clean water and sanitation.

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○ In regions where droughts are becoming more frequent due to climate change, communities may struggle to access safe drinking water, leading to health issues.

➤ **Health and Well-being:** Climate change can exacerbate health problems, especially for vulnerable populations.

○ For instance, **increased heat waves can lead to heat-related illnesses** and deaths, affecting the right to health.

○ Similarly, changes in weather patterns can also impact food security and nutrition, affecting people's overall well-being.

➤ **Migration and Displacement:** Climate change-induced events such as sea-level rise, extreme weather events, or desertification can force people to **migrate or be displaced from their homes.** This intersects with human rights, particularly the **right to residence and the right to seek asylum.**

○ For example, communities living in coastal areas may have to relocate due to sea-level rise, leading to issues related to resettlement and rights protection.

➤ **Indigenous Peoples' Rights:** Climate change can disproportionately affect indigenous communities that rely heavily on natural resources for their livelihoods and cultural practices.

○ For instance, changes in ecosystems due to climate change can threaten traditional livelihoods like **farming or fishing**, impacting indigenous peoples' rights to land, resources, and cultural heritage.

How does the Supreme Court Interpret Constitutional Provisions Concerning Climate Change?

➤ **Constitutional Provisions:**

○ **Article 48A** which mandates environmental protection and **Article 51A(g)** which promotes wildlife conservation, implicitly **guarantee a right to be safeguarded from climate change.**

○ **Article 21** recognises the right to life and personal liberty while **Article 14** indicates that all persons shall have equality before law and the equal protection of laws.

● These articles are important sources of the **right to a clean environment and the right against the adverse effects of climate change.**

● In *MC Mehta vs Kamal Nath Case, 2000,* the Supreme Court stated that the **right to a clean environment is an extension of the right to life.**

➤ **Implications of Recent Ruling:**

○ This decision has significant implications. It strengthens the legal basis for environmental protection efforts in India and **provides a framework for legal challenges against inaction on climate change.**

● It aligns with the growing international recognition of the human rights dimensions of climate change, as outlined by the **UN Environment Programme** and the **UN Special Rapporteur on Human Rights and the Environment.**

What are the Challenges in Balancing Climate Change Mitigation with Human Rights Protection?

➤ **Trade-offs**: Some climate mitigation measures may conflict with human rights, such as **restrictions on land use for conservation projects** or displacement due to renewable energy infrastructure development.

○ Finding solutions that minimise negative impacts while maximising benefits is challenging.

➤ **Access to Resources:** Climate actions like transitioning to renewable energy or implementing carbon pricing can **impact access to essential resources like energy, water, and food,** especially for marginalised communities.

➤ **Environmental Migration:** Climate-induced migration can strain social systems and lead to conflicts over resources and rights in host communities.

○ Managing migration flows in a way that respects the rights of both migrants and host populations is a multifaceted challenge.

➤ **Adaptation vs. Mitigation:** Balancing efforts to reduce greenhouse gas emissions (mitigation) with investments in adaptation to climate impacts can be challenging.

○ Prioritising one over the other can have implications for human rights, particularly fo**r communities already facing climate-related risks.**

➤ **International Cooperation:** Climate change is a global issue requiring international cooperation.

○ **Balancing national climate goals with global responsibilities** and ensuring that climate actions do not undermine the rights of vulnerable communities across borders is a complex task.

Reforms to Municipal Elections

Why in News?

The recent Supreme Court judgment on the Chandigarh mayoral election resurfaces the issues associated with the electoral processes of local urban bodies.

➤ Unlike, Lok sabha and state assemblies electionsin India, **municipal elections** still face the challenges of **timely elections and smooth transitions of power**.

Note:

Legal Provisions for Local Bodies' Elections:

➢ **Constitutional Provisions:**

  ❍ The superintendence, direction and control of the preparation of the electoral rolls for, and the conduct of, all elections to the **panchayats and municipalities** shall be vested in the **State Election Commission (SEC).**

  ❍ **The 74ᵗʰ Constitutional Amendment** bars the interference by courts in the electoral matters of municipalities.

  ❍ **Article 243U** through the 74ᵗʰ Constitution Amendment Act **mandates a five-year tenure** for urban local governments.

➢ **Legal Provisions:**

  ❍ The **Supreme Court**, in *Suresh Mahajan v. State of Madhya Pradesh Case, 2022,* stressed the inviolability of this constitutional mandate.

Election Commission of India (ECI)

About
- **Autonomous Constitutional Authority -** Administers Union/state election
  - LS, RS, State LA, the offices of the President and VP
- Estd - **25ᵗʰ Jan1950** (National Voters' Day)

Constitutional Provisions
Part XV - Article 324 to 329

Structure
- 1 Chief Election Commissioner and 2 Election Commissioners **appointed by President**
- **Tenure- 6 years, or up to the age of 65 years,** whichever is earlier
- Retiring ECs — **eligible for further appointment by the govt.**
- **Removal of CEC-** Resolution on the **ground of proven misbehaviour or incapacity,** with majority of 2/3rd members present and voting, supported by more than 50% of the total strength of the house

Major Roles and Responsibilities
- Determining Electoral Constituencies
- Preparing/Revising electoral rolls
- Notifying the schedules and dates of elections
- **Registering political parties and granting them the status of national or state parties**
- Issuing the Model Code of Conduct (MCC) for political parties
- Advising the President on **matters concerning the disqualification of MPs**

Challenges
- Truncated Tenure of CEC
- Executive Influence in Appointments
- Dependence on Centre for Finance
- Lack of Independent Staff

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What is the Status of Municipal Elections in India?

➢ **Annual Survey of India's City-Systems 2023** by **Janaagraha's** (non-profit institution)**:**
  ○ **Over 1,400 municipalities in India** did **not have elected councils** in place as of September 2021**.**
  ○ This indicates a significant and widespread issue across the country.

➢ The **Comptroller and Auditor-General of India (CAG)'s** audit revealed that, between 2015 and 2021, **over 1,500 municipalities didn't have elected councils**.
  ○ **Major cities like Chennai, Delhi, Mumbai, and Bengaluru** faced **delays** ranging from months to years in holding elections.

What are the Challenges Associated with Local Bodies' Elections?

➢ **Discretionary Powers in Scheduling Elections:**
  ○ Due to the **ambiguous constitutional safeguards,** government officials like SECs currently possess discretionary powers when it comes to scheduling elections.
  ○ **This flexibility can sometimes lead to inconsistent or delayed election timelines,** which may undermine the democratic process's transparency and fairness.

➢ **Undue Influence by State Governments:**
  ○ There is a concern about the **potential undue influence exerted by State governments to delay elections** for political or strategic reasons.
  ○ Such interference can compromise the integrity of the electoral process and erode public trust in democratic institutions.

➢ **Reliance on Manual Ballot Paper-Based Processes:**
  ○ The continued reliance on manual ballot paper-based processes introduces **vulnerabilities, such as errors in counting, the potential for tampering, and** delays in declaring election results.
  ○ This **traditional approach** may **not be as efficient or secure** as modern **Electronic Voting Machine (EVM) and Voter Verifiable Paper Audit Trail (VVPAT),** which could enhance the transparency and credibility of electoral outcomes.

➢ **Delayed Formation of Councils:**
  ○ Even after elections, municipal councils in urban local governments were not promptly constituted.
    ● For example: **In Karnataka, a delay of 12-24 months was observed post-elections.**

What are the Possible Solutions Regarding Local Bodies' Elections?

➢ **Empowering SECs:** To deal with the challenges effectively, SECs need to play a more significant role in overseeing the electoral process using the powers mentioned in the **Articles 243K and 243ZA** of the Constitution.

➢ **Empowerment for Ward Delimitation: Only 11 out of 35 states and union territories** have empowered **SECs to conduct ward delimitation**.
  ○ Ward delimitation is crucial for ensuring fair and equitable representation in municipal elections.
  ○ SECs should be granted greater authority, including the power to conduct ward delimitation.

➢ **Accountability Mechanisms:** Holding election officials and authorities accountable for any delays or irregularities in the conduct of municipal elections. This can be done through **transparent investigation processes** and appropriate disciplinary action**.**

➢ **Policy Reforms**: Addressing the challenges highlighted, from scheduling elections to ensuring fair processes, requires comprehensive policy reforms.
  ○ The idea of '**One Nation, One Election**' can be explored with major focus on the efficient and timely election of the local bodies.

Impact of the Forest Rights Act on Land Conflicts

Why in News?

Recently, **Land Conflict Watch**, a data research agency, tracking land-related conflicts in India, has noted a significant correlation between **land conflicts and the enforcement** of the **Forest Rights Act (FRA).**

What Does the Analysis Reveal About Land Conflict?

➢ **Land-related Conflicts in Constituencies of the Forest Rights Act (FRA):**

○ Out of the 781 conflicts documented in the **Land Conflict Watch (LCW)** database, a subset of 264 conflicts has been closely linked to **parliamentary constituencies** where the **Forest Rights Act (FRA)** is an important issue.

○ These constituencies are commonly referred to as **'FRA constituencies'** based on the **People's Forest report (by Centre for Science and Environment).**

○ 117 conflicts directly impact **forest-dwelling communities**, covering about 2.1 lakh hectares of land and affecting 6.1 lakh people.

➢ **Reasons for the Conflicts:**

○ **Conservation and Forestry Projects:** Approximately 44% of the conflicts in these constituencies arise **due to conservation and forestry projects, i**ncluding activities like plantations.

○ **Non-Implementation and Violation of FRA:** Approximately 88.1% of conflicts stem from the **non-implementation** or violation of crucial provisions within the **Forest Rights Act (FRA)**. These provisions include:

  ● **Prohibition on Evictions:** Communities residing in forests are evicted before their rights claims are vested.

  ● **Non Adhering to Prior Consent Requirement:** Often diversion of forest land for other purposes without the prior consent of **Gram Sabha.**

○ **Lack of Legal Protection over Land Rights:** Many forest-dwelling communities **lack adequate legal safeguards** for their land rights.

○ **Forest Administration and Protected Areas Management:** The Forest Department emerges as the **primary adversarial party** in conflicts that jeopardise the forest land rights of local communities.

➢ **Most Affected States:**

○ **Maharashtra, Odisha,** and **Madhya Pradesh** have the **highest number** of core FRA constituencies.

○ The states with the most forest rights issues in **critical FRA constituencies** are Odisha, Chhattisgarh, and the union territory of Jammu and Kashmir.

○ Out of the 781 ongoing conflicts documented in the Land Conflict Watch (LCW) database, 187 cases have emerged from **69reserved parliamentary constituencies.**

  ● **Scheduled Tribes (STs):** 110 conflicts occur in constituencies reserved for STs.

  ● **Scheduled Castes (SCs):** 77 cases are from constituencies reserved for SCs.

➢ **Nature of Conflicts:**

○ **Common Land Disputes:** The majority of conflicts in **reserved constituencies** revolve around common land, including both **community forests** and non-forested commons.

  ● Conflicts often involve complaints against procedural irregularities in land transactions.

○ **Private Land Conflicts:** In contrast, **unreserved constituencies** witness a higher frequency of conflicts over **private land**, specifically revenue patta lands.

○ Common Economic Activities Involved in Conflicts:

  ● **Infrastructure Projects:Infrastructure development** triggers conflicts in reserved constituencies. For example, the mining and power sector, Roads and railways projects are the primary cause of land conflicts.

○ There have been issues in the past regarding collection of minor forest produce leading to conflict.

Status of Implementation of FRA:

➢ **Titles Accorded:** As of February 2024, approximately **2.45 million titles have been granted to tribal and forest dwellers.**

○ However, out of **five million claims received, about 34% have been rejected**.

➢ **Recognition Rate:** Despite the vast potential, the actual recognition of forest rights has been limited. As of 31st August 2021, **only 14.75% of the minimum potential forest areas eligible for forest rights have been recognised** since the FRA came into force.

➢ **State Variations:**

○ **Andhra Pradesh:** Recognized 23% of its minimum potential forest claim.

○ **Jharkhand:** Recognized only 5% of its minimum potential forest area.

○ **Intra-State Variations:** Even within states, recognition rates vary. For instance, in Odisha, while the district of Nabarangapur achieved a 100% IFR recognition rate, Sambalpur's rate stands at 41.34%.

Note:

What is the Forest Rights Act, 2006?

➢ **About:**

❍ The **Forest Rights Act (FRA) of 2006** was introduced to formally recognise and grant forest rights and occupation in **forest lands** to forest-dwelling **Scheduled Tribes** and other traditional forest dwellers who have resided in these forests for generations, even though their rights had not been officially documented.

❍ It aimed to **address the historical injustices** faced by forest-dwelling communities due to the forest management policies of colonial and post-colonial India, which failed to acknowledge their **long-standing symbiotic relationship with the forests.**

❍ Additionally, the Act sought to **empower forest dwellers** by enabling them to access and utilise forest resources sustainably, promote biodiversity and ecological balance, and protect them from unlawful evictions and displacement.

➢ **Issues in Implementation:**

❍ **Recognition of Individual Forest Rights (IFRs)** has been lacking, often due to resistance from the Forest Department, indifference from other departments, and misuse of technology.

❍ The **implementation of digital processes**, like the **VanMitra software** in Madhya Pradesh, presents challenges in areas with poor connectivity and low literacy rates.

❍ The slow and incomplete recognition of **Community Forest Rights (CFRs)** is a significant gap in implementing the FRA.

● While Maharashtra, Odisha, and Chhattisgarh have made some progress in recognizing CFRs, most states lag.

❍ The issue of **'forest villages'** has not been adequately addressed in most states, indicating a lack of comprehensive implementation of the FRA.

❍ A **fact-finding committee** formed by **Call for Justice**, a Delhi-based organisation, has found **"mixed" implementation** of the **Forest Rights Act (FRA)** of 2006 in **five States (Assam, Chhattisgarh, Maharashtra, Odisha, and Karnataka).** Major issues reported by the committee include:

● **Challenges in Recognizing Unique Cultivation Practices:** In Assam, the **FRA doesn't** accommodate practices like shifting cultivation, causing issues in recognizing forest rights.

● **Concerns over Land Diversion:** While Maharashtra's Gadchiroli district showed satisfactory progress, there were **worries about diverting community forest land for non-forest purposes.**

● **Exclusion of Certain Forest Dwellers:** Some **traditional forest dwellers** were **excluded** from the FRA recognition process.

Need for Stricter Measures in Custodial Deaths

Why in News?

The Supreme Court has emphasised the necessity of adopting a "more rigorous approach" when considering **bail applications from police officers charged in cases of custodial deaths**.

What is Custodial Death?

➢ **About**

❍ Custodial death refers to a **death that occurs while a person is in the custody of law enforcement officials** or a correctional facility. It can occur due to **various causes such as the use of excessive force, neglect, or abuse** by the authorities.

❍ According to the **Law Commission of India**, the crime by a public servant against the arrested or the detained person who is in custody amounts to **custodial violence.**

➢ **Types of Custodial Death:**

❍ **Death in Police Custody:** Death in police custody can result from excessive force, torture, denial of medical care, or other forms of abuse or incidental cause.

❍ **Death in Judicial Custody:** Death in judicial custody may occur due to overcrowding, poor hygiene, lack of medical facilities, inmate violence, or suicide.

❍ **Death in the Custody of the Army or Paramilitary Forces:** It can happen through torture or extrajudicial killings.

Note:

Police Custody and Judicial Custody:

Aspect	Police Custody	Judicial Custody
Custody Location	Lock-up of a police station or with an investigating agency	Jail under custody of Magistrate
Appearance before Court	Within 24 hours before the concerned Magistrate	Until there is an order from the Court for bail.
Commencement	At the time of arrest by a police officer after receiving a complaint or filing an FIR	After public prosecutor satisfies the court that the custody of the accused is necessary for investigation.
Maximum Duration	24 hours (extendable to 15 days by the appropriate Magistrate)	90 days for offences punishable with life imprisonment, death, or imprisonment for not less than ten years; 60 days for other offences

STATES WITH HIGHEST CUSTODIAL DEATHS

2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22

Gujarat: 14, 13, 12, 17, 24
Maharashtra: 19, 11, 3, 13, 30
Uttar Pradesh: 10, 12, 3, 8, 8
Tamil Nadu: 11, 11, 12, 2, 4
Bihar: 7, 5, 5, 3, 18
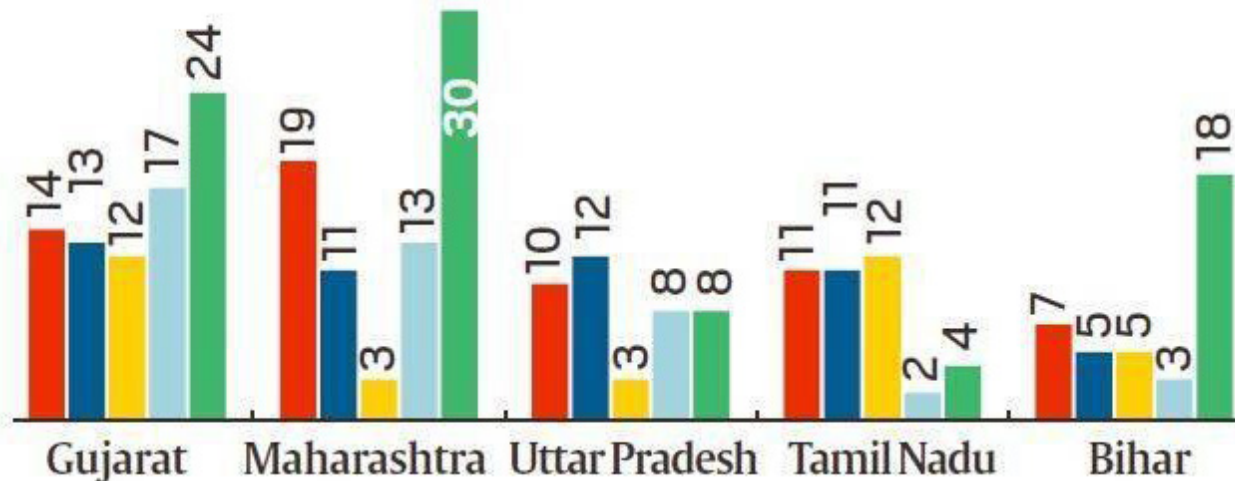
Why Restricting Custodial Deaths is a Necessity?

➢ It's against the basic right of individuals to be treated fairly by the law.

➢ India is a signatory of the **United Nations Convention Against Torture (UNCAT)** which prohibits inhuman treatment of people in judicial and police custody.

➢ In the **absence of strict rules to prevent custodial violence**, India faces challenges in extraditing individuals who have fled to other countries **to avoid pending judicial proceedings,** such as Vijay Mallya.

  ❍ **Economic offenders often cite lax regulations on custodial torture** in India in their extradition cases.

➢ Custodial violence can **hurt the mental health** of the person in custody because the police might not care about their feelings, leading to **cruel behaviour, sexual abuse**, and people hating each other. Example: **Custodial rape case of Mathura in 1972.**

Note:

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What are the Constitutional and Legal Framework Related to Custodial Death?

➤ **Constitutional Provisions:**

○ **Article 21 of the Constitution of India** guarantees the **right to life** and **personal liberty**, which includes the **right to be free from torture** and other cruel, inhuman, or degrading treatment or punishment.

○ **Article 20** grants protection against arbitrary and excessive punishment to an accused person, whether a citizen or foreigner or legal person like a company or a corporation. It contains three provisions in that direction:

● It contains provisions related to **No ex-post-facto law (Article 20 (1)), No double jeopardy (Article 20 (2)), and No self-incrimination (Article 20 (3)).**

● Also**, In Selvi v. State of Karnataka**, the court observed that the **state could not perform narco-analysis, polygraph, and brain-mapping tests on any individual without their consent.**

➤ **Legal Protections:**

○ **Section 24 Indian Evidence Act, of 1872** declares that all the confessions made by the **accused by succumbing to the threat** of investigating agencies would **not be admissible in a court of law.**

● This Section primarily works to prevent the accused from giving confessions using force against his will.

○ **Sections 330 and 331 of the Indian Penal Code (IPC)** criminalise voluntarily causing hurt or grievous hurt to extort confession or information from any person.

○ Section 41 of **the Criminal Procedure Code (CrPC)** was amended in 2009 to include safeguards so that:

● Arrests and detentions for interrogation have reasonable grounds and documented procedures.

● Arrests are made **transparent to family, friends, and the public,** and there is protection through legal representation.

What are the International Conventions Against Custodial Torture?

➤ **International Human Rights Law, 1948:**

○ The International Human Rights Law contains a provision that **protects people from torture and other enforced disappearances.**

➤ **United Nations Charter, 1945:**

○ It calls for **treating prisoners with dignity.** The Charter clearly states that despite being prisoners, their fundamental freedoms and human rights are set out in the **Universal Declaration of Human Rights**, the **International Covenant on Civil and Political Rights, and the International Covenant on Economic, Social, and Cultural Rights**.

○ The International Human Rights Law contains a provision that **protects people from torture and other enforced disappearances.**

➤ **The Nelson Mandela Rules, 2015:**

○ The Nelson Mandela Rules were **adopted by the United Nations General Assembly in 2015 to treat prisoners with inherent dignity** and to prohibit torture and other ill-treatment.

➤ **United Nations Convention Against Torture (UNCAT):**

○ It is an **international human rights treaty** under the purview of the United Nations that **aims to prevent torture** and **other acts of cruel, inhuman,** or degrading treatment or punishment around the world.

What Measures can be Taken to Combat Custodial Torture?

➤ **Strengthening Legal Systems:**

○ Enacting comprehensive legislation explicitly **criminalising custodial torture** like **Supreme Court** directives in **Prakash Singh Case 2006.**

● **SC** directed the separation of investigation and law and order functions to better improve policing, setting up of **State Security Commissions (SSC)** that would have members from civil society and forming a **National Security Commission.**

Note:

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- ○ Ensuring **prompt and impartial investigations into allegations** of custodial torture.
- ○ Holding perpetrators accountable through fair and expeditious trials.

➢ **Police Reforms and Sensitization:**

- ○ Enhancing **police training programs to emphasise respect for human** rights and dignity.
- ○ Promoting a culture of accountability, professionalism, and empathy within law enforcement agencies.
- ○ Establishing **oversight mechanisms** to monitor and address cases of custodial torture effectively.

➢ Empowering Civil Society and Human Rights Organisations:

- ○ **Encouraging civil society organizations** to actively advocate for victims of custodial torture.
- ○ The **National Human Rights Commission (NHRC) should be allowed to inquire** into any matter **even after one year** from the date of the alleged human rights violation.
  - Its jurisdiction should be expanded to cases of human rights violations by armed forces with appropriate measures.
- ○ Providing support and **legal assistance to victims** and their families.
- ○ Collaborating with international human rights bodies and organisations to seek redress and justice.

■■■

Economic Scenario

Highlights

- *Advance Pricing Agreements and Double Taxation Avoidance Agreement*
- *PayU Gets Approval as Payment Aggregator*
- *FSSAI Raises Pesticide Limits in Herbs and Spices*
- *RBI Guidelines for Asset Reconstruction Companies*
- *India Calls for Permanent Solution for Public Stockholding*
- *Reforms in Multilateral Development Banks*

- *India's Pulses Imports in FY24 Hit 6-Year High*
- *Decentralised Industrialisationin Tamil Nadu*
- *FIIs to Invest in India's Sovereign Green Bonds*
- *Cotton Cultivationin North India*
- *CDP-SURAKSHA*
- *India's Goods Exports Touches New Height*
- *Banks See Worst Deposit Crunch in 20 Years*

Advance Pricing Agreements and Double Taxation Avoidance Agreement

Why in News?

The **Central Board of Direct Taxes (CBDT)** has achieved a remarkable milestone by signing **125 Advance Pricing Agreements (APAs)** during the fiscal year 2023-24.

➢ This surge in APA signings underscores the growing importance of transfer pricing regulations and the efforts to provide certainty to taxpayers.

➢ In an additional development, India and Mauritius have amended their**Double Taxation Avoidance Agreement (DTAA)** to curb **tax evasion** and ensure fair taxation practices,

What is an Advance Pricing Agreement?

➢ **About:**
  ○ An APA is a formal arrangement between a taxpayer and a tax authority on transfer prices.
  ○ APAs allow businesses to reduce the risk of their transaction prices being challenged by tax authorities.
  ○ The APA programme has significantly contributed to India's mission of **promoting ease of doing business,** especially for **Multinational Enterprises (MNEs)** with a large number of cross-border transactions within their group entities.

➢ **Types of APAs:**
  ○ Unilateral APAs:

  - Limit risks for transactions between domestic entities. No guarantee of avoiding **double taxation for transactions** with foreign entities.
  - Relatively shorter proceedings compared to other APA types.
  ○ Bilateral APAs:
  - Limit risks for transactions between a domestic entity and a foreign entity. **Eliminate the risk of double taxation**. Longer proceedings as two states must agree.
  ○ Multilateral arrangements:
  - They mitigate risks for transactions between related entities in 3 or more states, serving as a protective instrument for complex transactions and ensuring safety for both parties, although the proceedings take longer.

➢ **Key Features of APAs:**
  ○ The APA process is **voluntary and will supplement appeal and other Double Taxation Avoidance Agreement (DTAA)** mechanisms for resolving transfer pricing disputes.
  ○ The **term of APA can be a maximum of 09 years** (Including **five years prospective and 04 years** retrospective if the taxpayer has opted for roll rollback mechanism).
  ○ The procedure ensures the protection of sensitive data provided by businesses.
  ○ Statistical data and summary information are published, but without disclosing names of entities with concluded arrangements or applicants.

➢ **Importance of APAs for Businesses:**
  ○ Provides tax certainty for determining arm's length price of international transactions.
  ○ Reduces risk of potential double taxation through bilateral or multilateral APAs.

Note:

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○ Reduces compliance costs by eliminating transfer pricing audit risk and resolving disputes.
○ Alleviates burden of record keeping by knowing required documentation in advance.
○ APAs allow businesses to reduce the risk of their transaction prices being set incorrectly or challenged by tax authorities.
○ APAs can be an effective tool for businesses to manage their tax risks and planning.

Central Board of Direct Taxes (CBDT)

➢ It is a statutory body, established under the **Central Board of Revenue Act, 1963,** and is a part of the **Department of Revenue in the Ministry of Finance.**
➢ CBDT provides essential inputs for policy and planning of direct taxes in India, at the same time it is also responsible for administration of direct tax laws through the **Income Tax** Department.

Double Taxation Avoidance Agreement (DTAA)

➢ A DTAA is a tax treaty signed between two or more countries. Its key objective is that tax-payers in these countries can avoid being taxed twice for the same income.
➢ A DTAA applies in cases where a taxpayer resides in one country and earns income in another.
➢ DTAAs can either be comprehensive to cover all sources of income or be limited to certain areas such as taxing income from shipping, air transport, inheritance, etc.
➢ In **1983, India and Mauritius agreed on the DTAA** to prevent double taxation. The DTAA applies to residents of both countries.

What Does the India and Mauritius DTAA Amendment Entail?

➢ **Principal Purpose Test (PPT):**
○ The amended protocol introduces the **Principal Purpose Test (PPT)** to the India-Mauritius Double Taxation Avoidance Agreement (DTAA).
● The PPT denies treaty benefits if obtaining those benefits was the primary purpose of any transaction or arrangement.
➢ **Article 27B:**
○ A new article, Article 27B, is included in the treaty, defining the 'entitlement to benefits.'
● This article specifies conditions under which treaty benefits, such as reduced withholding tax on interest, royalties, and dividends, are denied.
➢ **Focus on Preventing Treaty Abuse:**
○ The amendment aims to address concerns related to **tax evasion and avoidance** through the abuse of the DTAA.

○ By incorporating the PPT, the revised treaty seeks to ensure that tax benefits are not misused for improper purposes.
➢ **Uncertainty Regarding Past Investments:**
○ Despite the amendment, clarity is lacking regarding the treatment of past investments made under the previous provisions of the DTAA.
○ The Ministry of Finance is yet to issue clarification regarding the applicability of the new provisions to existing investments.

India and Mauritius Commercial Relations

➢ India has been one of the largest trading partners of Mauritius since 2005.
➢ Indian exports to Mauritius for FY 2022-2023 were USD 462.69 mn, while Mauritian exports to India were USD 91.50 mn, with total trade amounting to USD 554.19 mn.
○ Trade between India and Mauritius has grown by 132% in the last 17 years.
➢ **Petroleum products were the largest export item for India to Mauritius** until mid-2019. Other Indian exports to Mauritius include pharmaceuticals, cereals, cotton, shrimps, prawns, and bovine meat.
➢ Main Mauritian exports to India include vanilla, medical devices, needles, aluminum alloys, scrap paper, refined copper, and men's cotton shirts.
➢ Cumulative FDI worth USD 161 billion came from Mauritius to India between 2000 - 2022, largely due to the **DTAA.**
➢ Mauritius and India signed the **Comprehensive Economic Cooperation and Partnership Agreement (CECPA)** in 2021.
○ CECPA is the first trade agreement signed by **India with an African country.**
➢ In 2024, the **Unified Payment Interface (UPI) and also RuPay card services were launched in Mauritius.**
○ Users in Mauritius and India will experience convenience in making transactions, both domestically and internationally, through the **adoption of RuPay and UPI.**

PayU Gets Approval as Payment Aggregator

Why in News?

Fintech firm PayU has recently announced that it has received in-principle approval from the **Reserve Bank of India (RBI)** to operate as a **payment aggregator (PA),** under the **Payment and Settlement Systems(PSS) Act, 2007.**

Note:

> ➢ The **in-principle approval from RBI** permits PayU to onboard new merchants, yet **final approval typically takes six months to a year.**

What is a Payment Aggregator?

➢ **About:**
   ○ PA acts as an **intermediary between businesses and financial institutions**, handling payment processing on behalf of merchants.
      ● A payment aggregator simplifies the process of accepting electronic payments for businesses.
   ○ Payment aggregators streamline the payment acceptance process, allowing businesses to avoid the complexities of establishing direct relationships with financial entities.
   ○ They enable businesses to accept various payment methods, including credit cards, debit cards, e-wallets, and bank transfers, through a single platform.
   ○ Some examples of payment aggregators include Google Pay, Amazon Pay, Phone pe, and PayPal.
➢ **Capital Requirements:**
   ○ New PAs must have a **minimum net worth of Rs 15 crore** at the time of application and **reach Rs 25 crore by the end of the third financial year** post-authorisation.
➢ **Authorisation Process:**
   ○ While banks provide PA services as part of their normal banking relationship and do not require separate authorisation, non-bank PAs must obtain authorisation from the **RBI under the Payment and Settlement Systems Act, 2007 (PSS).**
➢ **Settlement and Escrow Account Management:**
   ○ Non-bank PAs are mandated to maintain funds collected in an **escrow account** with a **scheduled commercial bank.**
      ● PAs must adhere to specific timelines for settling funds with merchants based on the transaction lifecycle and agreed-upon terms.
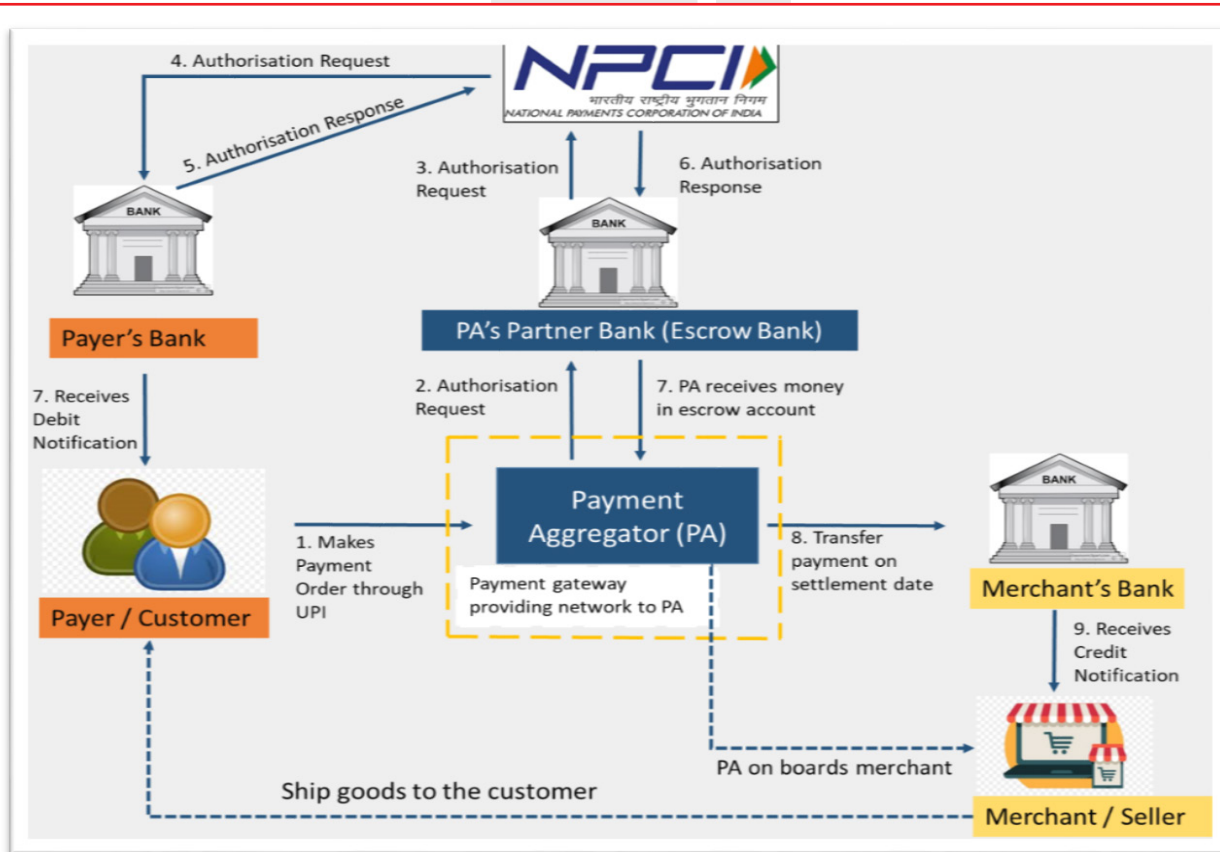
Fig 1: End to end non-bank payment aggregator transactional flow
The blue dotted lines in the fig. do not form part of payment system, but forms an important part of legal basis in merchant on-boarding process and shipment of goods to the customers in a PA business model.
Source: Author

Note:

Note:
➤ Unlike PAs, **Payment Gateways (PG)** provide technology infrastructure to route and facilitate the processing of online payment transactions **without handling funds.**
  ○ Payment Aggregators, on the other hand, **allow merchants to have multiple payment options** on their portal, covering the functionality of a payment gateway.

Basis of Distinction	Payment Gateway	Payment Aggregator
Role	A network bridging the gap between the merchant and the bank.	A solution streamlining end-to-end payment processes.
Payment Options	Primarily debit/credit card payments.	Offers multiple options: UPI, debit/credit cards, net banking, etc.
Integration	Merchants integrate each payment method or bank separately.	Integration requires partnering with just one service provider.
Services Provided	Transaction processing services.	Provides transaction processing along with additional services like access to reports, customer support, etc.
Funds Handling	Does **not store funds**; securely transmits encrypted payment data.	**Handles funds** through its Merchant Identification Number (MID). Transactions processed through the aggregator's system.
Examples	Axis Bank, HDFC Bank, MPGS (Mastercard Payment Gateways).	PhonePe PG, Stripe, Cashfree.

Payment and Settlement Systems (PSS) Act, 2007

➤ The PSS Act, 2007, provides for the regulation and supervision of payment systems in India and designates the RBI as the authority for that purpose and all related matters.

➤ The Reserve Bank is authorised under the Act to constitute a Committee of its Central Board known as the **Board for Regulation and Supervision of Payment and Settlement Systems (BPSS)**, to exercise its powers and perform its functions and discharge its duties under this statute.

➤ According to Section 4 of the PSS Act, 2007, **only the Reserve Bank can authorise the operation of a payment system.** Any person wanting to operate a payment system must apply for authorization under Section 5 of the PSS Act, 2007.

➤ The PSS Act 2007 **does not prohibit foreign entities from operating a payment system in India.** The Act does not discriminate/differentiate between foreign entities and domestic entities.

➤ Operating a payment system without authorization, non-compliance with Reserve Bank directions, or violating any provisions of the PSS Act, 2007 can result in criminal prosecution initiated by the Reserve Bank.

FSSAI Raises Pesticide Limits in Herbs and Spices

Why in News?

The recent decision of the **Food Safety Standards Authority of India (FSSAI)** to raise the **maximum residue limit (MRL)** of pesticides has sparked outrage from activists and scientists due to potential health risks and trade implications.

➤ The FSSAI order increased the **maximum residue limit (MRL)** of **pesticides** allowed in herbs and spices by **tenfold, from 0.01 mg/kg to 0.1 mg/kg**.

Note:

What is the Issue Regarding the FSSAI Order?

➤ **Inconsistencies in FSSAI's Previous Stance:**
○ The **FSSAI's** order contradicts its own previous **stance.** In April 2022, the authority acknowledged the **lack of field trial data for most Indian pesticides** and advocated using Maximum Residue Limits (MRLs) established by **Codex Alimentarius**.
● However, the **latest order deviates** from this approach for spices and herbs.

➤ **Data Transparency and Reliability:**
○ The maximum residue limit (MRL) of **pesticides for food and commodities**, **including spices and culinary herbs**, is specified under the **Food Safety and Standards (Contaminants, Toxins and Residues) Regulation, 2011**, based on **field trial data** received through the **Central Insecticides Board and Registration Committee (CIBRC), Union Ministry of Agriculture and Family Welfare.**
● But there is an **issue of conflict of interest** as these studies often come from the pesticide companies themselves.
○ The **Centre's Monitoring of Pesticide Residues at the National Level (MPRNL)** checks the amount of pesticide in our food, but **it does not test spices and lacks comprehensive data.**

➤ **Impact on Consumers and Trade:**
○ Countries with **stricter pesticide** regulations like **Europe, have rejected Indian products exceeding their MRLs**, as exemplified by recent recalls of Indian food products containing excessive pesticide residues.
○ E.g. In **April 2024,** few popular spices firms in India, have been **banned in Singapore and Hong Kong** for allegedly containing the **pesticide 'ethylene oxide' beyond permissible limits**.
● **Ethylene Oxide** is a **harmful pesticide** unfit for human consumption and whose long-term exposure can cause **cancer.**

What is Pesticide Poisoning?

➤ **About :**
○ Pesticide is any **chemical or biological substance** intended to prevent, destroy or **control damage from pests** which has both agricultural and non-agricultural uses.
○ They also **pose serious risks to human health** and the **environment,** especially when they are misused, overused, or sold illegally.

➤ **Pesticide Regulation in India:**
○ Pesticides are **regulated under the Insecticides Act, 1968** and the **Insecticides Rules, 1971**.
● The **Insecticides Act of 1968** covers the registration, manufacture and sale of pesticides in India.
● The Act is administered by the **Department of Agriculture and Farmers Welfare, Ministry of Agriculture and Farmers Welfare.**

➤ **Types of Pesticides:**
○ **Insecticides:** The chemicals that are used to **protect plants from insects and pests** are known as Insecticides.
○ **Fungicides**: This class of crop protection chemicals is used to **control the spread of fungal diseases** in plants.
○ **Herbicides**: Herbicides are **chemicals that kill or control the growth of weeds** in the cultivation area.
○ **Bio-Pesticides:** They are pesticides of biological origin, i.e., derived from **animals, plants, bacteria** etc.
○ **Others:** This includes plant growth regulators, nematicides, rodenticides and fumigants.

➤ **Concept of Pesticide Poisoning:**
○ Pesticide poisoning is a term that refers to the **adverse effects** of exposure to **pesticides on humans or animals.**
○ Pesticide exposure can cause **adverse health effects** including **cancer, effects on reproduction, and immune or nervous systems.**
○ According to the **World Health Organization (WHO)**, pesticide poisoning is one of the leading causes of death among agricultural workers worldwide.

➤ **Types of Pesticide Poisoning:**
○ **Acute poisoning** occurs when a person ingests, inhales, or comes into contact with a **large amount of pesticide in a short period**.
○ **Chronic poisoning** occurs when a person is **exposed to low doses of pesticide over a long period**, which can cause damage to various organs and systems in the body.

Note:

What is the Food Safety and Standards Authority of India?

➢ **About:**
  ○ The **Food Safety and Standards Authority of India (FSSAI)** is a **statutory body** formed under the **Food Safety and Standards Act, 2006**.
    ● The Food Safety and Standards Act, 2006 **replaced acts** like the Prevention of Food Adulteration Act,1954, Fruit Products Order, 1955, Meat Food Products Order, 1973.
  ○ It operates under the **Union Ministry of Health and Family Welfare.**

➢ **Mandate:**
  ○ The FSSAI has the mandate of **regulating the manufacture, storage, distribution, sale, and import of food articles**, and also **establishing standards** to ensure food safety.

➢ **Structure and Organization:**
  ○ It is made up of **22 members** and a **Chairperson**. **One-third** of the members must be **women**.

➢ **Functions:**
  ○ **Setting Food Safety Standards:** It has the **power to lay down regulations** to implement food safety standardsin the country.
  ○ **Food Testing Accreditation:** It has the power to set up **guidelines for** the **accreditation of food testing laboratories** in the country.
  ○ **Inspecting Authority Powers:** Food safety officers have the right to enter and inspect any place where food products are manufactured, stored, or exhibited.
  ○ **Food Safety Research:** The Research and Development division of FSSAI is responsible for **research in the field of food safety standards**. They continuously try to **adopt international food standards.**
  ○ **Identifying Threats:** The FSSAI is required to **collect data regarding food consumption**, contamination, emerging risks, etc.

➢ **Events and Campaigns of FSSAI:**
  ○ **World Food Safety Day.**
  ○ **Eat Right India.**
    ● **Eat Right Station.**
    ● **Eat Right Mela.**
  ○ **State Food Safety Index.**
  ○ **RUCO (Repurpose Used Cooking Oil).**
  ○ **Food Safety Mitra.**
  ○ **100 Food Streets.**

RBI Guidelines for Asset Reconstruction Companies

Why in News?

The **Reserve Bank of India (RBI)** has issued a direction outlining updated guidelines for **Asset Reconstruction Companies (ARCs),** effective from 24th April 2024.

What are the RBI Guidelines for Asset Reconstruction Companies (ARCs)?

➢ **Increased Minimum Capital Requirement:**
  ○ ARCs are **now required to have a minimum capital of Rs 300 crore,** a significant increase from the previous requirement of Rs 100 crore.
  ○ Existing ARCs are granted a transition period to achieve the new minimum **Net Owned Fund (NOF)** threshold of Rs 300 crore by 31st March 2026.
    ● ARCs must ensure a minimum capital of Rs 200 crore by 31st March 2024, as part of the transition towards the higher capital requirement.
  ○ In case of **non-compliance at any of the above stages,** the non-complying ARC shall be subject to **supervisory action,** including a prohibition on undertaking incremental business till it reaches the required minimum NOF applicable at that time.

➢ **Eligibility as Resolution Applicants:**
  ○ **ARCs with a minimum NOF of Rs 1000 crore** are permitted to act as **resolution applicants** in the asset resolution process under **Insolvency and Bankruptcy Code, 2016 (IBC).**

➢ **Investment Opportunities:**
  ○ ARCs are allowed to deploy funds in government securities and deposits with scheduled commercial banks, **Small Industries Development Bank of India (SIDBI),National Bank for Agriculture and Rural Development (NABARD)** or such other entities as may be specified by the central bank from time to time.
  ○ Additionally, ARCs can invest in **short-term instruments** like money market **mutual funds,certificates of deposit**, and corporate bonds/**commercial papers** with a short-term rating equivalent to AA- or above by an eligible credit rating agency.
    ● However, there is a cap of **10% of the NOF on the maximum investment in such short-term instruments.**

Note:

What are Asset Reconstruction Companies?

➢ **About:**
- ○ ARCs are financial institutions that buy **Non-Performing Assets (NPAs)** or bad assets from banks and financial institutions.
  - ● This allows the banks and institutions to clean up their balance sheets.
- ○ It is incorporated under the **Companies Act, 2013** and registered with the Reserve Bank of India under the **Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest (SARFAESI) Act, 2002.**

➢ **Examples:**
- ○ **National Asset Reconstruction Company Limited (NARCL)** has been established by banks to aggregate and consolidate stressed assets for subsequent resolution. It is majority-owned by **Public Sector Banks (PSBs)** with a 51% stake.
- ○ **India Debt Resolution Company Ltd. (IDRCL)** is another entity that will then attempt to sell the stressed assets in the market.
  - ● PSBs and Public Financial Institutes (FIs) will hold a maximum of 49% stake in IDRCL. The remaining 51% stake will be with private-sector lenders.
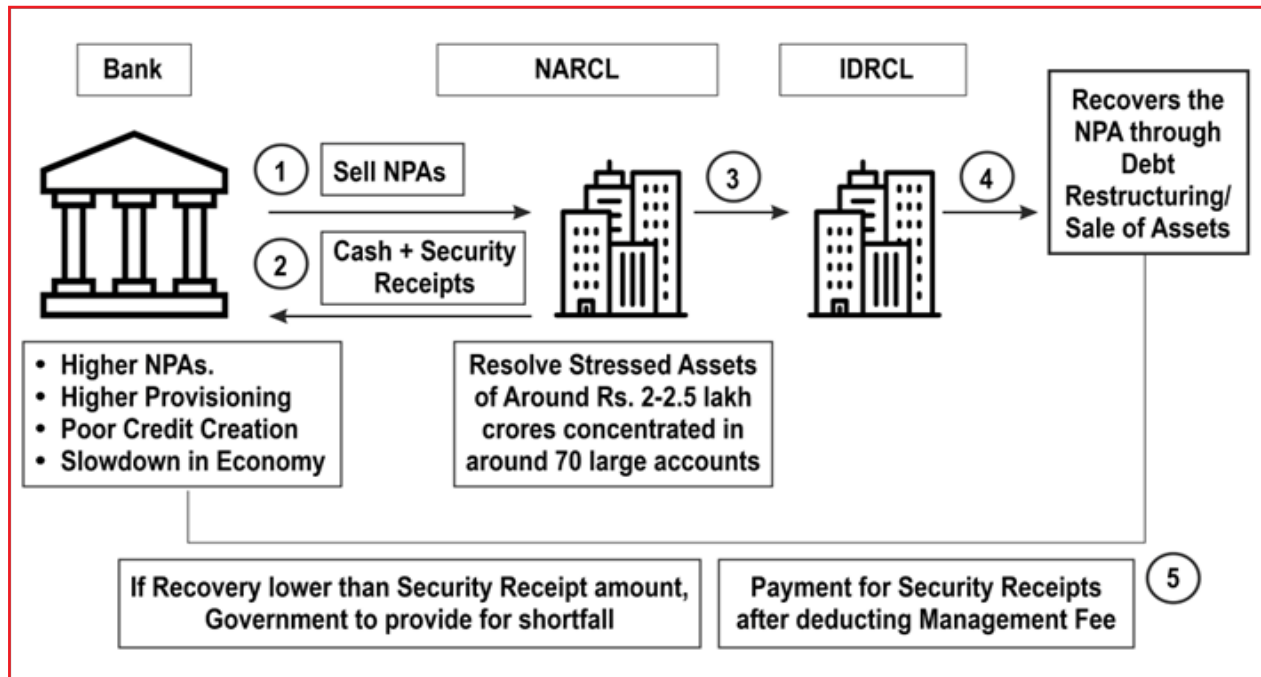
➢ **Function:**
- ○ Empowered by the **SARFAESI Act, 2002.** ARCs specialize in the recovery and turnaround of distressed assets.
  - ● They purchase bad debt from lenders either in cash or through a combination of cash and security receipts.

➢ **Business Model:**
- ○ **Acquisition of Stressed Loans:** Lenders sell stressed loans to ARCs at a discount, freeing up their resources to focus on fresh loans.
- ○ **Security Receipts:** ARCs issue security receipts to lenders, redeemable upon recovery of the specific loan.
  - ● They also charge a management fee of 1.5% to 2% of the asset value annually and earn from recoveries, sharing upside with the selling financial institutions.

➢ **Challenges:**
- ○ ARCs often deal with **aged NPAs,** which present challenges in terms of **valuation and recovery** due to prolonged delinquency.
- ○ Aggregating **debt from multiple lenders to the same borrower** can be complex, requiring coordination and agreement among various stakeholders.
- ○ ARCs face difficulties in **raising funds on their balance sheets,** limiting their capacity to acquire distressed assets or provide necessary support to borrowers for revival.

Note:

○ Determining the **fair value of distressed assets for acquisition** and recovery purposes can be challenging, particularly when dealing with illiquid or complex assets.

➢ **Recent Changes in ARC Regulations by RBI:**

○ **Strengthening Corporate Governance:** RBI mandated that the chair of the board and at least half the directors in a board meeting must be independent directors to enhance corporate governance at ARCs.

○ **Increased Transparency:** ARCs are required to disclose their track record on returns generated for security receipt investors and engage with rating agencies for schemes floated in the last eight years to improve transparency.

○ **Investment Requirements:** ARCs must invest in **security receipts (SRs) at a minimum of either 15%** of the transferors' investment in such receipts or 2.5% of the total receipts issued, whichever is higher, as against the previous requirement of 15% of total security receipts in all cases.

● SRs are instruments issued by ARCs to Qualified Buyers (QB) in exchange for their purchase of distressed assets from banks and **Non-Banking Financial Companies (NBFCs).**

SARFAESI Act, 2002

Role of SARFAESI Act, 2002

Securitization of financial assets and issue of security receipts	Reconstruction of Financial assets	Enforcement of security interest	Other functions
Acquire financial assets by issuing debentures or bonds or by agreement. Realize the same and redeem the security receipts issued to the QBs	Take measures for proper management, sale, debt restructuring, settlement, or take possession subject to RBI guidelines from time to time	Enforce security interest by the secured creditor without the intervention of the court	Act as an agent of banks or FIs for recovery;Act as manager of the secured assets appointed by the lender; or Act as receiver appointed by the court

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India Calls for Permanent Solution for Public Stockholding

Why in News?

At the 13th ministerial conference of the **World Trade Organization (WTO),** India asserted a robust position concerning the **permanent solution for public stockholding for food security.**

Note:

What are the Key Points Highlighted by India?

➢ **Broadening Focus of WHO**: India has called for a shift in the WTO's focus, urging it to move beyond catering solely to the trade interests of agricultural exporters.

○ Instead, the organisation should prioritise **addressing fundamental concerns such as food security and sustaining livelihoods**.

➢ **Developing Country Needs**: India argues that public stockholding programs are essential for developing countries to ensure **food security for their populations,** especially for vulnerable sections of society.

○ The current WTO rules allow some leeway for developing countries regarding **public stockholding** programs.

○ However, these provisions are temporary and **India seeks a permanent solution** that acknowledges their development needs.

○ Recently, **G-33 nations** also upheld the right of the developing country to use the **Special Safeguard Mechanism (SSM)** as an important instrument against major import surges or sudden price declines.

➢ **Call for Level Playing Field:** India stressed the necessity of **creating a level playing field in international agriculture trade,** especially for low-income or resource-poor farmers across the globe. This aligns with the broader goal of promoting fairness and equity in trade practices.

○ India pointed out the glaring **disparities in domestic support** provided by countries to their farmers.

● Notably, subsidies in some developed countries are reported to be up to **200 times higher** than those in developing nations.

○ Also, India as a member of **G-33 nations** also urged WTO to find a permanent solution to public stockholding.

What is Public Stockholding?

➢ **About**: Public stockholding refers to the practice of governments **purchasing, storing, and eventually distributing food grains**. India along with many other countries uses this system to ensure food security for its population.

➢ **Advantages:**

○ **Food Security:** Public stockpiles ensure a **buffer against potential food shortages** caused by factors like droughts, crop failures, or market disruptions.

● This helps maintain food availability for the population, especially during emergencies.

○ **Price Stabilisation:** By releasing stocks when prices rise due to short supply, governments can **moderate price fluctuations** and prevent sharp spikes that can burden consumers, particularly low-income households.

○ **Supporting Farmers:** Governments can buy grains at predetermined **minimum support prices**, offering some income security for farmers. This can incentivise production and maintain agricultural output.

○ **Social Welfare Programs:** Stockpiled food can be used for **social welfare programs**, providing subsidised food to vulnerable populations and those facing food insecurity.

➢ **Disadvantages:**

○ **Fiscal Burden:** Maintaining large stockpiles can be expensive for governments. Storage and maintenance costs can **strain public finances and divert resources** from other development priorities.

○ **Market Distortion:** Subsidised food grains from public stockpiles may **undercut market prices,** discouraging private sector investment in agriculture and potentially impacting overall production efficiency.

○ **Spoilage and Waste:** Improper storage leads to **spoilage and wastage of food grains**, causing economic losses and undermining the program's effectiveness.

○ **Corruption Risks:** The management of public stockpiles is **vulnerable to corruption and mismanagement,** leading to inefficiencies and leakages within the system.

○ **International Trade Issues:** Subsidised stockpiling practices can create friction in international trade.

● Some countries argue such practices **distort fair market competition** and disadvantage exporters from other nations.

Note:

- For instance,**Thailand recently accused India**of using its public stockpiles of rice, meant for domestic food security, to gain an unfair advantage in the export market.

What is the WTO Agreement on Agriculture?

➢ **About:** The **WTO Agreement on Agriculture (AoA)** is a set of international rules established during the **Uruguay Round of trade negotiations** that came into effect in 1995.

   ○ It aims to promote fair trade in agricultural products by:

      - **Reducing Trade Barriers:** The AoA encourages member countries to reduce tariffs, quotas, and other restrictions on agricultural imports.
      - **Domestic Support:** It regulates the types and levels of subsidies that governments can provide to their domestic agricultural producers.
      - **Market Access**: The AoA promotes greater market access for agricultural exports by reducing import barriers.

➢ **Agriculture Subsidy:** As per WTO norms, agri subsidy should not exceed **10% of the value of agricultural production** for developing countries. But developing nations receive certain protections.

   ○ However, under the **Peace Clause of December 2013**, WTO members agreed to refrain from challenging any breach in the prescribed ceiling by a developing nation at the dispute settlement forum of the WTO.

   ○ India's subsidy on rice had exceeded the threshold on multiple occasions forcing it to invoke the **'peace clause'**

WTO AGREEMENT ON AGRICULTURE (AoA)

A WTO treaty negotiated during the Uruguay Round of the General Agreement on Tariffs and Trade (GATT); formally ratified in 1994 at Marrakesh, Morocco; Came into effect in 1995

FEATURES

- Market access (Promote market access for agricultural products by reducing trade barriers)
- Domestic support (Subsidy Boxes are included in this)
- Export subsidies (Reduce the use of export subsidies, which can distort trade)

SUBSIDY BOXES

Amber Box Subsidies:

- ›› Can distort international trade by making a country's products cheaper in comparison to those of other countries
  - » Examples: Subsidies for inputs such as fertilisers, seeds, electricity, irrigation, and Minimum Support Price (MSP)
- ›› Amber box is used for all domestic support measures that are deemed to distort production and trade
  - » As a result, the signatories are required to commit to reducing domestic supports that fall into the amber box
- ›› Members who do not make these commitments must keep their amber box support within 5-10% of their value of production. (Di Minimus Clause)
  - » 10% for developing countries
  - » 5% for developed countries
- ›› India's MSP program remains under scrutiny, as it exceeds 10% ceiling

Blue box Subsidies:

- ›› "Amber box with conditions" — designed to reduce distortion
- ›› Any support that would normally be in the amber box is placed in the blue box if it requires farmers to limit production
  - » These subsidies aim to limit production by imposing production quotas or requiring farmers to set aside part of their land
- ›› At present there are no limits on spending on blue box subsidies

Green Box Subsidies:

- ›› Domestic support measures that don't cause trade distortion or at most cause minimal distortion
- ›› These subsidies are government funded without any price support to crops
  - » Also include environmental protection and regional development programmes
- ›› Allowed without limits (except in certain circumstances)

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Note:

What is WTO?

➤ Established in 1995, the WTO succeeded the **General Agreement on Tariffs and Trade (GATT)** post-World War II.

○ It promotes smooth, free, and predictable trade among its **164 members, representing 98% of global trade.**

➤ Developed through trade negotiations, its rules aim to eliminate quotas and reduce tariffs, with the current framework largely shaped by the 1986-94 Uruguay Round negotiations.

○ The WTO Secretariat is headquartered in **Geneva, Switzerland.**

Reforms in Multilateral Development Banks

Why in News?

Recently, the **UN Secretary-General,** highlighted that reforming **multilateral development banks** (MDBs) will be a major focus at this year's **Summit of the Future,** occurring during the **UN General Assembly** in September 2024.

What are Multilateral Development Banks?

➤ **About**: MDBs are **international financial institutions** that provide financing and professional advice for economic and social development projects in developing countries.

○ They are formed and capitalised by **multiple countries** through pooled resources and shared representation on their boards.

○ They originated in the aftermath of **World War II** to rebuild war-ravaged nations and stabilise the global financial system.

➤ **Objective:** Unlike commercial banks, MDBs do not seek to maximise profits for their shareholders.

○ Instead, they prioritise development goals, such as ending extreme poverty and reducing economic inequality.

○ They often lend at low or no interest or provide grants to fund projects in **infrastructure, energy, education, environmental sustainability,** and other areas that promote development.

➤ **Major MDBs: World Bank Group**, **Asian Development Bank**, **African Development Bank**, **European Bank for Reconstruction and Development**, and the **Inter-American Development Bank.**

What are the Key Challenges Related to MDBs?

➤ **Resource Constraints:** MDBs are often constrained by the amount of capital they have available to lend. This can **limit their ability to finance large-scale development projects,** especially in the face of growing needs.

➤ **Keeping Pace with Global Challenges:** The world faces new and complex challenges like **climate change, pandemics, and technological disruption**.

○ MDBs have not fully adapted these growing challenges in their strategies and approaches to effectively address these issues.

➤ **Decision-Making:** The current voting structure in some MDBs gives more power to developed countries.

○ Developing nations are **pushing for a greater say in decision-making** to reflect their needs and priorities.

○ Concerns exist about the **transparency of MDB decision-making processes** and the need for stronger accountability mechanisms to prevent corruption and mismanagement.

○ For example, the **United States holds a considerable 15.85%** of the voting power in the World Bank, granting it substantial influence over the institution's decisions.

➤ **One-SIze FIts All Approach:** One-size-fits-all lending conditions from MDBs, such as **uniform interest rates or repayment schedules**, are challenging for countries of the global south due to their diverse economic structures and **financial capabilities.**

What Reforms are Necessary in Multilateral Development Banks?

➤ **Financing Climate Action:** MDBs can play a crucial role in mobilising resources for climate change mitigation and adaptation projects in developing countries.

○ This could involve creating **dedicated climate finance facilities, offering green bonds**, and developing innovative risk-sharing instruments for renewable energy projects.

➤ **Knowledge Sharing & South-South Cooperation:** Encouraging MDBs to facilitate knowledge exchange between developing countries.

○ This could involve **connecting countries facing similar challenges** and fostering collaboration on successful development strategies.

➤ **Graduation Strategies:** As middle-income countries develop, creating clear pathways for them to **"graduate" from concessional loans** to market-rate financing from private sources.

○ This frees up MDB resources for low-income countries that still need significant support.

Note:

➢ **Social and Environmental Safeguards:** Strengthening safeguards to ensure MDB-funded projects **avoid negative social or environmental impacts** and promote **inclusive sustainable development.**

Which are the Key MDBs India is Affiliated With?

➢ **World Bank Group:** India is a member of **four of the five constituents** of the World Bank Group viz., **International Bank for Reconstruction and Development (IBRD), International Development Association (IDA), International Finance Corporation (IFC) and Multilateral Investment Guarantee Agency (MIGA).**
  ○ India is not a member of **ICSID (International Centre for Settlement of Investment Disputes).**
  ○ World Bank assistance in India started in **1948** when funding for the **Agricultural Machinery Project** was approved.
➢ **Asian Development Bank (ADB):** India is a founding member of ADB and the bank's **fourth-largest shareholder.**
  ○ Since commencing operations in 1986, ADB has aligned its operations in the country to the government's developing priorities.
  ○ This approach will be pursued through the forthcoming country partnership strategy, 2023–2027.
➢ **Asian Infrastructure Investment Bank (AIIB):** India is a founding member of the Asian Infrastructure Investment Bank (AIIB) with the **second-highest voting share after China.**
  ○ It is headquartered in Beijing.

➢ **New Development Bank (NDB):** India, the founding member of NDB, is the second-largest recipient of NDB's financial support at USD 7.5 billion after China.
  ○ It was established in 2015 by the **BRICS** countries **(Brazil, Russia, India, China and South Africa).**

India's Pulses Imports in FY24 Hit 6-Year High

Why in News?

India's **pulses imports skyrocketed 84%** in fiscal 2024, reaching a **six-year high**. This jump follows **lower production** and the government's **decision to waive import duties** on red lentils and yellow peas.

What is the Current Status of Pulses in India?

➢ **India's Pulses Production Status:**
  ○ India is the **largest producer** (25% of global production), **consumer** (27% of world consumption), and **importer** (14% of pulses) in the world.
  ○ Pulses account for **around 20% of the area under foodgrains** and contribute around **7%-10% of the total foodgrains production** in the country.
  ○ Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh, and Karnataka are the **top five pulses-producing states.**

The production of pulses during the last three years and in 2022-23 (as per third advance estimates) are given as under:

Year	Production (Lakh Tonnes)
2019-20	230.25
2020-21	254.63
2021-22	273.02
2022-23*	275.04

* As per third advance estimates

Note:

- ➢ **India's Pulses Import Status:**
  - ❍ India imported **4.65 million metric tons of pulses** in the fiscal year 2023-24 (up from **2.53 million tons in 2022-23**), the highest since 2018-19.
    - ● **In value terms**, imports of pluses jumped 93% to USD 3.75 billion.
  - ❍ Red lentil imports, particularly from Canada, doubled to 1.2 million tons.
  - ❍ Duty-free imports from December onwards led to a rise in yellow pea imports from Russia and Turkey.
  - ❍ The South Asian nations including India, usually **import pulses from Canada, Myanmar, Australia, Mozambique, and Tanzania.**
- ➢ **Pulses:**
  - ❍ **Temperature:** Between 20-27°C
  - ❍ **Rainfall:** Around 25-60 cm.
  - ❍ **Soil Type:** Sandy-loamy soil.
  - ❍ These are the major sources of protein in a vegetarian diet.
  - ❍ **Being leguminous crops,** all these crops except arhar help in restoring soil fertility by fixing nitrogen from the air. Therefore, **these are mostly grown in rotation with other crops.**
  - ❍ **Pulses** are **grown throughout the agricultural year.**
  - ❍ **Rabi Pulses (contribute over 60%)**: Gram (chickpea), Chana (Bengal gram), Masoor (lentil), Arhar (pigeon pea).
    - ● **Rabi crops require a mild cold climate** during the sowing period, during vegetative to pod development- cold climate, and during maturity/harvesting - warm climate.
  - ❍ **Kharif Pulses**: Moong (green gram), Urad (black gram), Tur (arhar dal).
    - ● Kharif **pulse crops** require a warm climate throughout their life from sowing to harvesting.

Major Pulses Producing States
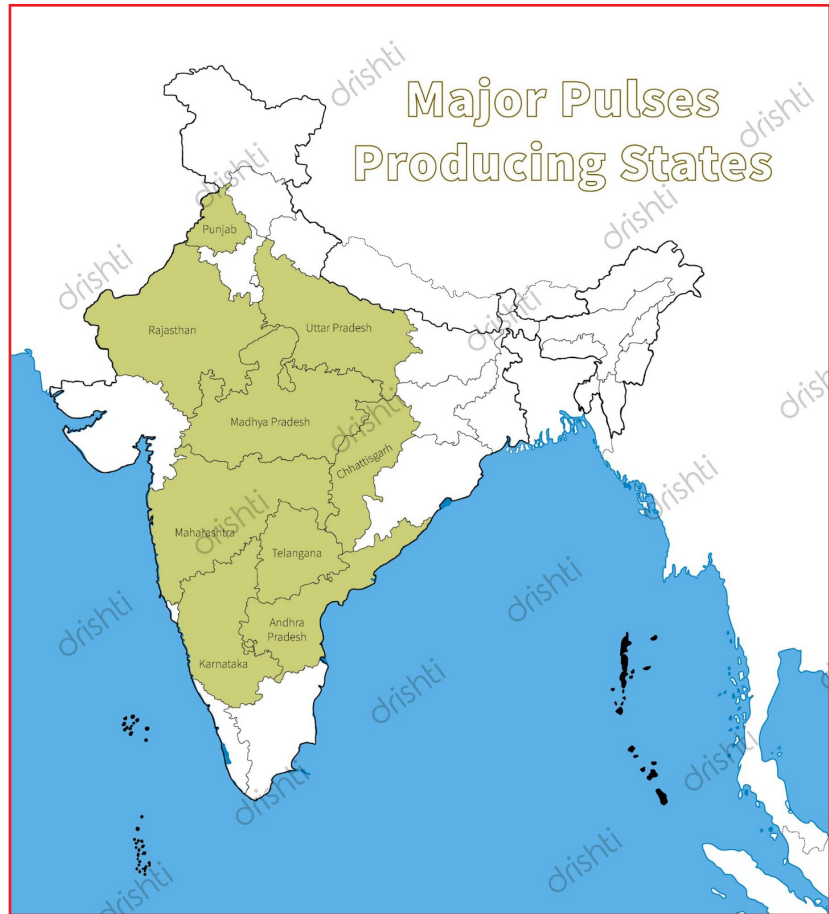
What are India's Initiatives to Boost Pulses Production?

- ➢ **National Food Security Mission (NFSM)-Pulses:**
  - ❍ The NFSM-Pulses initiative, led by the Department of Agriculture & Farmers Welfare, operates in 28 States and 2 Union Territories including Jammu & Kashmir and Ladakh.
  - ❍ **Key Interventions Under NFSM-Pulses**:
    - ● **Assistance to farmers** through States/UTs for various interventions.
    - ● Cropping system demonstrations.
    - ● Seed production and distribution of **HYVs/hybrids**.
    - ● Additionally, the establishment of **150 Seed Hubs** for Pulses has significantly contributed to increasing the availability of quality pulse seeds.
- ➢ **Pradhan Mantri Annadata Aay SanraksHan Abhiyan (PM-AASHA) Scheme:**
  - ❍ This comprehensive umbrella scheme **(launched in 2018)** comprises three components:

Note:

- **Price Support Scheme (PSS):** Procurement from pre-registered farmers at **Minimum Support Price (MSP)**.
- **Price Deficiency Payment Scheme (PDPS):** Compensates farmers for price differences.
- **Private Procurement Stockist Scheme (PPSS):** Encourages private sector participation in procurement.

➢ **ICAR's Role in Research and Variety Development:**

○ The **Indian Council of Agricultural Research (ICAR)** plays a pivotal role in enhancing the productivity potential of pulse crops through **research and development** efforts. The ICAR focuses on:

- **Basic and strategic research on pulses**.
- Collaborative applied research with **State Agricultural Universities**.
- Development of **location-specific high-yielding varieties** and production packages.
- During the period from 2014 to 2023, an impressive **343 high-yielding varieties** and hybrids of pulses have been officially recognised for commercial cultivation across the country.

What are the Reasons Behind India's Dependence on Pulses Imports?

➢ **Shifting Cropping Patterns:**

○ Traditionally, farmers in India practised crop rotation with pulses. However, in recent decades, there has been a shift towards cultivating **water-intensive cereals** like rice and wheat due to the following reasons.

- Rice and wheat are staples in most Indian diets, leading to a rise in consumption demands.
- Government incentives like **higher margins over the average cost of production in MSPs** and **assured procurement** for these crops.
- Availability of better irrigation facilities in some areas.

➢ **Lower Profitability:**

○ Pulses often **offer lower returns per hectare** compared to cereals. This discourages farmers from planting them, especially on fertile and irrigated land.

➢ **Climate Challenges:**

○ **Erratic rainfall and droughts** can **negatively impact** pulse production, which are generally **rain-fed crops.**

➢ **Limited Technological Advancements:**

○ Compared to cereals and cash crops, research and development in pulse and higher susceptibility to diseases and pests.

What can be Done to Ensure India's Self-Sufficiency in Pulses?

➢ **Boosting Domestic Production:**

○ Offering minimum support prices **(MSPs)** for pulses that are **competitive with other crops** like rice and wheat.

○ Providing subsidies for seeds, fertilisers, and other agricultural inputs specific to pulses.

○ **Offering crop insurance** schemes to mitigate risks associated with weather fluctuations.

➢ **Promote Crop Rotation:**

○ Encouraging the farmers to integrate pulses back into their cropping patterns by highlighting the long-term benefits of crop rotation for soil health and sustainable farming.

➢ **Develop High-Yielding Varieties:**

○ Investing in **research and development of drought-resistant**, high-yielding pulse varieties suited to different regional conditions.

○ Encourage the adoption of these improved varieties through farmer training and extension programs.

➢ **Improving Irrigation Infrastructure:**

○ Expanding irrigation facilities to areas suitable for pulse cultivation, particularly **drought-prone regions**.

○ Promoting **water-efficient irrigation** techniques like **drip irrigation** to conserve water.

➢ **Mitigating Price Fluctuations:**

○ Improving **storage facilities** for pulses to minimise post-harvest losses and **ensure price stability** throughout the year.

○ **Streamline Supply Chain Management:** Enhance efficiency in the supply chain to reduce transportation costs and minimise price manipulation by middlemen.

➢ **Promotion of Alternative Protein Sources:**

○ Encouraging **dietary diversification** (addressing **hidden hunger**) by promoting the consumption of **protein-rich alternatives** like lentils, millets, and even eggs.

Note:

What is NAFED?
➢ National Agricultural Cooperative Marketing Federation of India Ltd. was established on the auspicious day of Gandhi Jayanti on 2nd October 1958.
➢ It is registered under the Multi-State Co-operative Societies Act.
➢ It is an apex organization of marketing cooperatives for agricultural produce in India.
➢ It is currently one of the largest procurers of agricultural products like onions, pulses, and oilseeds.

Decentralised Industrialisation in Tamil Nadu

Why in News?

Tamil Nadu's economic landscape is undergoing a significant transformation, moving beyond its agricultural roots to embrace a **more diversified and industrialised economy.**

➢ This shift is **largely attributed to the emergence of cluster capitalists** and **'entrepreneurs from below,'** who are driving growth in various industry sectors.

How Diversified and Industrialised is Tamil Nadu's Economy?

➢ Tamil Nadu's farm sector accounts for a **lower share (12.6%)** of its **gross value added (GVA)** and **employed labour force (28.9%) compared to the national average.**

➢ The state has a **higher share of industry, services, and construction** in its economy relative to the all-India figures.

➢ Tamil Nadu's **agriculture** itself is diversified, with the **livestock subsector** contributing a significant **45.3% of the farm GVA**, the highest among all states.

➢ The state has developed numerous industry clusters across various sectors like textiles, engineering, leather, food processing, etc.

➢ **Gujarat is more industrialized than TN,** with the factory sector generating 43.4% of the state's GVA and engaging 24.6% of its workforce, compared to TN's 22.7% and 17.9% respectively.

○ However, Gujarat also has a higher share of agriculture in its GVA (15.9%) and workforce (41.8%) compared to TN's 12.6% and 28.9%.

○ This **makes Gujarat's economy less diversified and balanced compared to TN.**

SECTOR-WISE SHARES OF GVA & WORKFORCE: 2022-23 (%)

	Gross Value Added*		Workforce	
	All-India	Tamil Nadu	All-India	Tamil Nadu
Agriculture	18.19	12.55	45.76	28.87
Industry**	18.80	22.69	12.27	17.88
Construction	8.84	11.70	13.03	18.04
Services	54.18	53.05	28.94	35.21

*At Basic Prices; ** Includes manufacturing, mining, electricity and utilities. GVA is GDP net of product taxes and subsidies. Source: National Accounts Statistics and Periodic Labour Force Survey.

Sector-wise shares of GVA and workforce for the year 2022-23

Note:

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What Factors have Driven Tamil Nadu's Economic Transformation?

➢ **Decentralised Industrialisation:**
  ❍ Tamil Nadu has only a **few major business entities with annual revenues over Rs 15,000 crore**.
  ❍ However, TN's economic **transformation has been driven by medium-scale businesses** with turnover ranging from **Rs 100 crore to Rs 5,000 crore,** with some reaching the Rs 5,000-10,000 crore level.
    ● The industrialisation has been decentralised and spread out through the development of clusters.
    ● This decentralised approach has allowed for a more diverse and balanced economic landscape.

➢ **Cluster-Based Development:**
  ❍ Cluster development is a **form of economic development that involves placing businesses in a specific geographic area**.
    ● The goal is to increase productivity and maximise regional efficiency.
  ❍ **Examples of successful clusters in TN:**
    ● **Tirupur:** Cotton knitwear (employs 800,000 people);
    ● **Coimbatore:** Spinning mills and engineering goods;
    ● **Sivakasi:** Safety matches, firecrackers, and printing;
  ❍ These clusters have not only created employment opportunities but also **fostered a culture of entrepreneurship and innovation**, contributing to the overall economic development of the state.

➢ **Diversification Beyond Agriculture:**
  ❍ The creation of employment in cluster towns has reduced Tamil Nadu's workforce dependency on farming, leading to diversification beyond agriculture.
    ● This shift has expanded the state's economic base by providing alternative employment options.

➢ **Entrepreneurship from Below:**
  ❍ Entrepreneurs from **more ordinary peasant stock and provincial mercantile castes** have played a crucial role in driving the state's economic transformation.
    ● These entrepreneurs have built and expanded businesses in various sectors, contributing to the overall industrialisation and economic development of Tamil Nadu.

  ❍ Diverse community involvement, has contributed to the success in achieving industrialisation and diversification beyond agriculture.

➢ **Social Progress Indices:**
  ❍ High social progress indices resulting from **public health and education investments** have likely contributed to Tamil Nadu's relative success in achieving industrialisation and diversification beyond agriculture.
  ❍ The state's focus on social development has created a conducive environment for economic growth and transformation, leading to improved living standards and economic opportunities for its residents.

What is the Decentralised Industrialisation Model?

➢ **About:**
  ❍ Decentralisation involves the systematic **distribution of powers and functions across different political and economic agents** in society.
  ❍ It encompasses both political and economic dimensions, including the decentralisation of decision-making, ownership of means of production, structure of production, and location of production.

➢ **Key Features:**
  ❍ Dispersion of industrial activities across **rural and peri-urban areas,** reducing dependence on urban centers.
  ❍ Promotion of **small and cottage industries, owned and controlled by local communities,** to foster local entrepreneurship and economic empowerment.
  ❍ Emphasis on **labour-intensive production** methods to generate employment opportunities and alleviate rural poverty.
  ❍ The utilisation of **local resources and skills** to meet local needs and promote sustainable development.
  ❍ Interdependence between different village industries creates a self-sustaining economic ecosystem.
  ❍ Equalisation of production and distribution through the decentralised location of production units.

➢ **Benefits:**
  ❍ Facilitates balanced **regional development and reduces spatial inequalities.**
  ❍ Promotes **inclusive growth** by providing economic opportunities to rural communities.

Note:

○ Enhances resilience to economic shocks by diversifying industrial activities across regions.

○ Fosters community participation and ownership in the development process.

○ Supports sustainable development by utilizing local resources efficiently and reducing environmental impacts.

➤ **Challenges:**

○ Limited technical capacity can lead to **greater inefficiency.**

○ Decentralised models may lead to increased costs due to a loss of economies of scale, especially in procurement.

○ Skilled labour may not be uniformly available across regions in a decentralised model and may result in skill gaps in certain locations.

Gandhi's Concept of Decentralisation

➤ Gandhi envisioned a socio-political and economic order based on an egalitarian framework, emphasising decentralisation in decision-making and ownership of means of production.

➤ He advocated for village-level self-sufficiency and empowerment, promoting rural industrialisation through small-scale, labor-intensive production units such as khadi and village industries.

Initiatives for the Growth of the Industrial Sector in India

➤ **Production-Linked Incentive (PLI);**

➤ **PM Gati Shakti- National Master Plan;**

➤ **Bharatmala and Sagarmala Project;**

➤ **Start-up India;**

➤ **Make in India 2.0;**

➤ **Atmanirbhar Bharat Campaign;**

➤ **Special Economic Zones.**

FIIs to Invest in India's Sovereign Green Bonds

Why in News?

The recent decision by the **Reserve Bank of India (RBI)** to allow **Foreign Institutional Investors (FIIs)** operating within the **International Financial Services Centre (IFSC)** to invest in **India's Sovereign Green Bonds (SGrBs)** marks a significant step towards financing the nation's transition to a **low-carbon economy.**

Note:

➤ FIIs are institutional investors that invest in assets belonging to a different country than where the organizations are based.

➤ The **Securities and Exchange Board of India (SEBI)** regulates FII investments in the country, while the RBI maintains the investment ceilings to keep FII participation in check.

What are Sovereign Green Bonds (SGrBs)?

➤ **About:**

○ In the **Union Budget 2022-23**, the FM announced the government's decision to issue **SGrBs,** a kind of government debt that specifically funds projects attempting to accelerate **India's transition to a low-carbon economy.**

○ Funds raised through SGrBs are earmarked exclusively for **green projects,** ensuring transparency and accountability in fund utilization.

○ SGrBs typically offer **lower interest rates compared to Government-Securities (G-Secs),** reflecting their alignment with sustainable development objectives.

○ Issuance of SGrBs requires adherence to internationally recognised green standards and certification processes to ensure the credibility of funded projects.

➤ **Classification:**

○ SGrBs are classified under the **Statutory Liquidity Ratio (SLR),** a liquidity rate set by the RBI for financial institutions.

● Financial institutions must maintain SLR with themselves before lending to customers, affecting the availability of funds for other purposes.

➤ **Greenium:**

○ As SGBs typically yield lower interest rates compared to conventional G-Secs, the **difference in interest rates between SGrBs and G-Secs is called a greenium.**

● Central banks and governments globally encourage embracing greeniums to support the transition to a greener future.

➤ **Sovereign Green Bonds Framework:**

○ The Finance Ministry released **India's first SGrB Framework in 2022** detailing the kind of projects that would receive funding through this class of bonds.

○ Funding Projects:

● Funds will be directed towards **nine green project categories: renewable energy,** energy

efficiency, clean transportation, climate adaptation, **sustainable water management**, pollution control, sustainable land use, **green buildings**, and biodiversity conservation.

- **Excluded Projects:**
  - Projects involving **fossil fuel** extraction, **nuclear power generation,** and direct waste incineration. Additionally, projects related to alcohol, weapons, **tobacco,** gaming, or palm oil industries are also excluded.
  - Furthermore, **renewable energy projects using biomass** from protected areas, landfill projects, and **hydropower** plants larger than **25 MW are not eligible.**

○ The Indian government sought validation from **Norway-based validator Cicero** to enhance credibility. Cicero rated India's framework as a **"green medium"** with a score of "good governance," showing alignment with global green standards set by the **International Capital Market Association (ICMA).**

➢ **Features of the SGrB:**
  ○ issued through **Uniform Price Auction** (a public sale where a fixed number of similar items are sold for the same price).
  ○ eligible for **Repurchase Transactions (Repo).**
  ○ reckoned as eligible investments for SLR purposes.
  ○ **eligible for trading in the secondary market.**
➢ **Management:**
  ○ Sovereign green bond proceeds will be deposited into the **Consolidated Fund of India** and managed by the **Ministry of Finance's Public Debt Management Cell.**
  ○ Allocation and utilization of Green Bonds will be audited by the **Comptroller and Auditor General (CAG) of India.**
➢ **Advantages:**
  ○ Indian green bonds not only support sustainability goals but **also strengthen the Indian currency** by attracting investors and increasing funds within the central bank.
  ○ The growing demand for socially responsible investments and the limited supply of **green bonds can raise their price and yield.**

How do FIIs' Investments in Green Bonds Boost India's Green Transition?

➢ FIIs investing in India's green projects **expands the capital pool** for funding the country's ambitious **2070**

net zero goals, which aim to derive **50% of India's energy from non-fossil fuel sources**and **reduce the nation's carbon intensity by 45%,** as promised at **United Nations Climate Change Conference(COP 26) in Glasgow 2021.**

➢ FIIs provide an alternative source of funding, lessening the pressure on domestic lenders and freeing up capital for other uses.
➢ The recent inclusion of foreign investors has **expanded the pool of potential investors for India's SGrBs,** potentially leading to more funds for green projects that aim to reduce the **carbon footprint of the Indian economy,** and contributing to India's **Sustainable Development Goals.**
  ○ The government aims to raise Rs 20,000 crore through SGrBs in FY24 and **plans to borrow Rs 12,000 crore in the first six months of FY25**.
➢ Foreign investors bring valuable knowledge and experience in **green technologies** and project management, which can benefit Indian green infrastructure projects.

What are the Challenges Regarding India's SGrBs?

➢ **Lack of Green Taxonomy:**
  ○ The absence of a green taxonomy or standardized method to assess an investment's environmental credentials poses a challenge.
    - Without clear criteria, there is a risk of **greenwashing,** where projects falsely claim to be environmentally friendly to secure funding.
➢ **Framework Implementation:**
  ○ While the Finance Ministry released India's first SGrB Framework, its implementation and enforcement remain critical.
  ○ Ensuring that funded projects align with the defined criteria and contribute to environmental sustainability requires robust monitoring and evaluation mechanisms.
➢ **Project Selection and Impact:**
  ○ Identifying **new green projects with credible audit trails** and high impact is crucial for optimal deployment of SGrB proceeds.
    - Projects with limited private capital, such as Distributed Renewable Energy and clean energy transition finance for MSMEs, may face challenges in attracting sufficient funding.
➢ **Availability of Suitable Projects:**
  ○ Securing a pipeline of eligible green projects may be challenging, particularly in sectors like offshore

wind, grid-scale **solar power production**, and **Electric Vehicles (EVs).**

- The government needs to actively **encourage and incentivize** the development of such projects to ensure a steady flow of investment opportunities.

Cotton Cultivation in North India

Why in News?

As the **2024-25 kharif cotton** planting season approaches in North India, stakeholders foresee a potential dip in cotton acreages.

➢ This shift is driven by a confluence of factors, including severe **pink bollworm (PBW)** infestation, weak prices for the fibre crop, and rising labour costs.

➢ Farmers, faced with these challenges, may increasingly opt for alternative crops such as paddy, maize, and guar.

What is Pink Bollworm (PBW) Infestation?

➢ **About:**
- *PBW (Pectinophora gossypiella)* is a major pest within the **American bollworm complex,** primarily affecting cotton crops.
- PBW, also known as **Saunders,** damages developing cotton fruits such as the **flower bud (square)** and the seed-containing boll.
- The pest lays eggs on buds, flowers, and bolls, with the hatched larvae burrowing into the bolls to feed on seeds, resulting in lint damage and quality deterioration.

➢ **Historical Context:**
- The introduction of **Bt Cotton,** genetically modified to resist pests like PBW, aimed to mitigate risks. However, **PBW has developed resistance to Bt Cotton over time,** exacerbating the problem.

➢ **Contributing Factors to Resistance Development:**
- **Continuous planting of cotton without crop rotation** in central and southern cotton-growing zones favoured PBW persistence.
- **Illegal cultivation of unapproved Bt/HT seeds** by farmers contributed to PBW resistance development.
- Extended cultivation of **long-duration hybrids** provided continuous host availability for PBW.
- Extending the **cotton crop beyond recommended periods** facilitated PBW survival and reproduction.

○ Lack of **adherence to refugia planting exacerbated resistance** development by constant exposure of PBW to Bt protein.
- Refugia plants are the **biodiversity plants that grow around cultivated plants**, providing a place of **protection and food for natural enemy insects.**

➢ **Impact on Crop Yield and Economy:**
○ PBW infestation results in significant yield losses and **affects cotton fibre quality,** impacting farmers' income and sustainability.
○ According to entomologists, cotton farms in Haryana have experienced significant damage, with around 25% of farms reporting a 50% loss.
○ Punjab has witnessed a 65% damage rate, while Rajasthan tops the list with a staggering 90% loss, underscoring the severe economic repercussions for farmers and the regional economy.

Pests of Cotton	
Insect	**Symptoms**
Spotted bollworm (Earias vitella)	➢ Central shoots dry, wither and drops down. ➢ Later, it bores into flower buds, bolls and causes shredding.
American bollworm (Helicoverpa armigera)	➢ Flaring up of bracts (surround the flower bud in a pyramid-like shape). ➢ Bore holes filled with frass on squares.
Tobacco caterpillar (Spodoptera litura)	➢ Irregular bore holes. ➢ Skeletonization of leaves. ➢ Heavy defoliation.
White fly (Bemicia tabaci)	➢ Suck sap from the leaves. ➢ Low quality lint. ➢ Boll shedding occurs in severe cases.
Cotton Aphid (Aphis gossypii)	➢ Both nymphs and adults suck the sap from leaves. ➢ Shiny appearance due to honeydew secretion.
Cotton mealy bug (Phenacoccus solenopsis)	➢ Bushy shoots. ➢ At an early stage of cotton planting, crop senescence (ageing) may be seen. ➢ Sooty mould formation.

Note:

What are the Trends in Cotton Cultivation in North India?

- ➤ **Impact on North Indian States:**
  - ○ **Punjab, Rajasthan, and Haryana,** the primary cotton-growing states in North India, are all witnessing fluctuations in cotton acreages.
  - ○ Punjab experienced a significant decline of **32% in cotton area during the 2023-24 kharif season,** while Rajasthan witnessed a slight decrease and Haryana saw a marginal increase.

- ➤ **Shift Towards Alternative Crops:**
  - ○ Farmers in North India are exploring alternative crop options such as **paddy, maize, guar, mung beans, and groundnuts** due to quality concerns and poor realisations.
  - ○ In Punjab, where water availability is favourable, farmers may revert to paddy cultivation. In Rajasthan, the preference may lean towards guar cultivation, while maize and mung beans could emerge as alternatives in other areas.

- ➤ **Labour Costs and Realisations:**
  - ○ **Rising labour costs** further compound the challenges faced by cotton farmers in North India. Additionally, **poor quality resulting from pest infestations** has impacted farmers' realisations, leading to concerns about compensation for crop losses.

- ➤ **Expectations for the Coming Season (2024):**
  - ○ Despite the prevailing challenges, some optimism exists regarding the forthcoming cotton season. Favourable monsoon forecasts and relatively better prices offer a glimmer of hope for a modest increase in cotton acreages. However, concerns persist, including the lack of advanced technology and the severity of PBW damages observed in certain areas.

Cotton	
Growing Conditions	➤ Cotton is a Kharif crop that requires 6 to 8 months to mature.
	➤ **Temperature:** Between 21-30°C (Requires a hot, sunny climate with a long frost-free period)
	➤ **Rainfall:** Around 50-100 cm (Most productive in warm and humid conditions).
	➤ **Soil Requirements:** Cotton can be planted in a wide range of soils, from **medium to heavy,** but **black cotton soil is the most ideal for cotton cultivation.**
	➤ It can tolerate a **pH range of 5.5 to 8.5** but is sensitive to waterlogging.
Major Cotton Growing States	➤ Northern Zone: Punjab, Haryana, Rajasthan.
	➤ Central Zone: Gujarat, Maharashtra, Madhya Pradesh.
	➤ Southern Zone: Telangana, Andhra Pradesh, Karnataka, Tamil Nadu.
Significance	➤ Primary source for the textile industry, commanding two-thirds of India's total textile fibre consumption.
	➤ **Cottonseed oil** and cake/meal are used for cooking and as feed for livestock and poultry.
	○ Cottonseed oil is India's third-largest domestically-produced vegetable oil.
	➤ Cotton is one of India's most important commercial crops, accounting for approximately **25% of global cotton production.**
	➤ It is often referred to as **"White-Gold"** due to its economic significance.
Initiatives	➤ Kasturi cotton
	➤ Minimum Support Price (MSP)
	➤ Cotton Corporation of India (CCI)
	➤ National Food Security Mission-Commercial Crops (NFSM-CC)

Note:

Cotton Cultivation

India got 1st place in the world in cotton acreage with 130.61 lakh hectares area under cotton cultivation i.e. around 40% of the world area of 324.16 lakh hectares.

India is the only country which grows all four species of cotton

G. Arboreum and G. Herbaceum (Asian cotton)

G. Barbadense (Egyptian cotton)

G. Hirsutum (American Upland cotton)
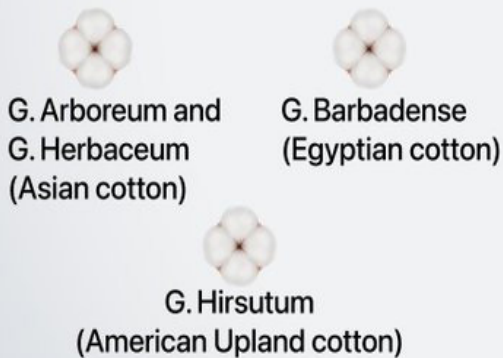
Major 9 cotton growing states divided according to Agro-Ecological zones

- Northern Zone
- Central Zone
- Southern Zone
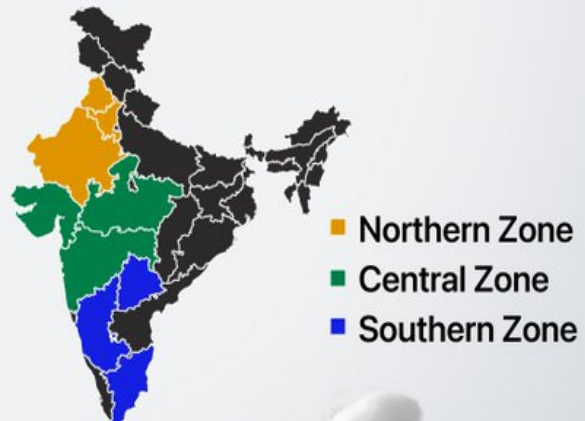
CDP-SURAKSHA

Why in News?

Recently, the Central government has launched a new platform called **CDP-SURAKSHA to disburse subsidies to horticulture farmers** under the **Cluster Development Programme (CDP)**.

Note:

➤ This will boost the growth of India's horticulture sector, which contributes nearly **one-third** to the agriculture **gross value addition (GVA)**.

What is CDP-SURAKSHA?

➤ **About:**
  - SURAKSHA stands for **"System for Unified Resource Allocation, Knowledge, and Secure Horticulture Assistance."**
  - The platform will allow an instant disbursal of subsidies to farmers in their bank accounts by utilising the **e-RUPI**voucher from the**National Payments Corporation of India (NPCI).**
  - It has features such as database integration with**PM-KISAN**, cloud-based server space from NIC, **UIDAI** validation, eRUPI integration, local government directory (LGD), content management system, **geotagging, and geo-fencing**.

➤ **Working:**
  - The platform allows access to farmers, vendors, implementing agencies (IA), cluster development agencies (CDAs), and officials of the **National Horticulture Board (NHB).**
  - A farmer can login using their mobile number, place an order and contribute their share of the cost of planting material.
  - After payment, an**e-RUPI** voucher will be generated. This voucher will then be received by a vendor, who will provide the required planting material to the farmer.
  - After the delivery of material, farmers have to verify the delivery through geo-tagged photos and videos of their field.

  - After verification, the implementing agencies (IA) will release the money to the vendor for the e-RUPI voucher. The vendor will be required to upload an invoice of the payment on the portal.
  - The IA will collect all the documents and share them with the CDA for subsidy release, then only the subsidy will be released to the IA.
  - However, the farmer, who raised the demand for the plant material using the platform, can avail of the subsidy at the first stage only.

What is e-Rupee?

➤ It is a **one-time payment mechanism** that enables **users to redeem the voucher without a card, digital payments app or internet banking access**, at the merchants accepting **UPI e-Prepaid Vouchers.**

➤ The e-RUPI would be shared with the beneficiaries for a specific purpose or activity by organisations via SMS or QR code.

A cashless and contactless instrument for digital payment: e-RUPI

About e-RUPI

- **Developer:** e-RUPI is developed by the National Payments Corporation of India (NPCI) which also developed the Unified Payments Interface (UPI) platform and the Bharat Interface for Money (BHIM).
- **Functioning of e-RUPI:** It is basically a digital voucher which a person receives on phone in the form of an SMS or QR code.
  - It is a pre-paid voucher, which the person can then go and redeem at any centre that accepts it.
  - It can be easily used even by those who use basic feature phones.
- **Significance:** Even the smallest of online payments can be tracked down, ensuring that no misuse of payments occur.
  - It is therefore expected to play a major role in strengthening Direct Benefit transfer (DBT) schemes.

What is the Status of the Horticulture Sector in India?

➤ India is the **2nd largest** producer of fruits and vegetables.

➤ Fruits and vegetables account for almost 90% of the total horticulture production in the country.

➤ The Indian horticulture sector contributes about 33% to the agriculture **Gross Value Added (GVA)**making a very significant contribution to the Indian economy.

Note:

- India is currently producing about 320.48 million tons of horticulture produce which has surpassed the food grain production, that too from a much smaller area (25.66 million Ha. for horticulture against 127.6 M. ha. for food grains).
  - The **productivity of horticulture crops is much higher compared to the productivity of food grains** (12.49 tones/ha against 2.23 tones/ha.).
- According to the **Food and Agricultural Organisation (FAO)**, India leads in the production of certain vegetables (ginger and okra) and fruits (banana, mangoes and papaya).
  - In terms of **exports, India is ranked 14th in vegetables and 23rd in fruits**, and its share in the global horticultural market is a mere 1%.
  - Bangladesh, UAE, Nepal, Netherlands, Malaysia, Sri Lanka, the UK, Oman, and Qatar are the major export destinations for fresh fruits and vegetables.
- Around **15-20% of the fruits and vegetables in India are wasted** along the supply chain or at a consumer level, contributing to **greenhouse gas emissions (GHGs).**

What is the Cluster Development Program (CDP)?

- **About:**
  - It is a **central sector programme** aimed at growing and developing identified horticulture clusters to make them globally competitive.
  - **A horticulture** cluster is a regional/geographical concentration of targeted horticulture crops.
- **Implementation:**
  - It will be implemented by the **National Horticulture Board (NHB)** of the Ministry of Agriculture and Farmers' Welfare.
  - In a pilot phase, the programme will be implemented in 12 horticulture clusters, out of the total **55 clusters** selected for the programme.
  - These clusters will be implemented through **Cluster Development Agencies** (CDAs) which are appointed on the recommendations of the respective State/UT Government.

- **Objectives:**
  - To address all major issues related to the Indian **horticulture sector** including pre-production, production, post-harvest management, logistics, marketing and branding.
  - CDP **aims to improve exports of targeted crops by about 20%** and create **cluster-specific brands to enhance the competitiveness of cluster crops.**
  - To leverage geographical specialisation and promote integrated and market-led development of horticulture clusters.
  - To converge with other initiatives of the Government such as the **Agriculture Infrastructure Fund**.
- **Examples:**
  - Some **clusters identified for the implementation of CDP are:**
    - Siphahijala (Tripura) for pineapple
    - Solapur (Maharashtra) and Chitradurga (Karnataka) for pomegranate
    - West Jaintia Hills (Meghalaya) for turmeric.

What are the Challenges Faced by the Horticulture Sector?

- **Production Challenges:** Such as small operational landholdings, lack of irrigation facilities and poor soil management, threat of pests etc.
- **Institutional Challenges:** The limited outreach of **farm insurance** and **farm mechanisation**, combined with a **lack of access to institutional credit** for small and marginal farmers, contribute to lower investment in the sector.
- **Climate Change**: Climate change-related events such as changing weather patterns, droughts, floods, and other natural disasters, are another significant challenge that can lead to crop failures and losses.
- **Farmers Producer Organisation (FPO):** Weak **FPOs** are also the sector's challenges, limiting farmers' ability to benefit fully from the opportunities available.
- **Infrastructural Issues:** Other challenges such as the **perishable nature** of fruits and vegetables, **Poor logistics** and lack of equitable **cold storage and warehousing** facilities, a **lack of guidance** for farmers on which crops to plant, resulting in overproduction of certain commodities and shortages of others.

Note:

What Initiatives have been Taken for for the Development of the Horticulture Sector?

➢ **National Horticulture Board (NHB):**
- ❍ It was set up by the Government of India in **1984** as an Autonomous organization under the administrative control of the **Ministry of Agriculture and Farmers Welfare.**
- ❍ It aims to improve the **integrated development of the Horticulture industry** and to help in coordinating, and sustaining the production and processing of fruits and vegetables.

➢ **Cluster Development Programme:**
- ❍ It aims to promote the integrated and market-led development of pre-production, production, post-harvest, logistics, branding, and marketing activities by leveraging the geographical specialisation of horticulture clusters

➢ **CHAMAN (Coordinated Horticulture Assessment and Management using geo-informatics):**
- ❍ Under this project, sound methodology for estimation of Horticulture crops is being developed and implemented on pilot basis using **Sample Survey methodology** and **Remote Sensing** technology.

➢ **Mission for Integrated Development of Horticulture (MIDH):**
- ❍ It is a **centrally sponsored scheme** for the holistic growth of the horticulture sector covering fruits, vegetables, root & tuber crops, mushrooms, spices, flowers, aromatic plants, coconut, cashews, cocoa and bamboo.
- ❍ **Subschemes:**
  1. National Horticulture Mission (NHM)
  2. **Horticulture Mission for North East and Himalayan States (HMNEH)**
  3. National Horticulture Board (NHB)
  4. Coconut Development Board (CDB)
  5. **Central Institute of Horticulture (CIH), Nagaland.**

➢ **Horticulture Area Production Information System (HAPIS):**
- ❍ This is a web portal for the online submission of district-level data pertaining to area and production of horticulture crops.

➢ **Pradhan Mantri Krishi Sinchayee Yojana (PMKSY):**
- ❍ It is addressing the irrigation problem which aims to promote the development of **irrigation infrastructure, expand the cultivable areas,** and enhance on-farm water efficiency.

India's Goods Exports Touches New Height

Why in News?

India's **merchandise exports** reached a peak of USD 41.68 billion in March 2024 compared to the FY 2022-23.

What does the Current Export Data Reveal?

➢ **About:**
- ❍ India's **goods exports** reached USD 41.68 billion in March 2024 compared to the FY 2022-23, despite a 0.67% decline from last year's tally,
- ❍ **Imports**, on the other hand, **dropped** by 6% to USD 57.3 billion during the same period.
- ❍ The goods **trade deficit** contracted to USD 15.6 billion, the lowest in 11 months.

➢ **Key Factors:**
- ❍ **Gold Imports Decline: Gold imports** fell sharply by 53.6% in March to USD 1.53 billion.
- ❍ **Non-Oil, Non-Gold Imports:** The drop in non-petroleum, non-gold imports contributed to the overall decline.
- ❍ **Silver Imports Surge:** Interestingly, **silver imports jumped** to USD 816.6 million.

➢ **Impact on Full-Year Figures (2023-24):**
- ❍ While goods exports averaged USD 35.4 billion in the first ten months, the last two months' spike lifted the full-year export figure to USD 437.1 billion.
- ❍ This performance is 3.1% below the record USD 451.1 billion achieved in the previous year.

➢ **FY 2023-24 Projections:**
- ❍ Despite persistent global challenges like the **Ukraine war**, and the **West Asian crisis**, overall exports are **estimated to surpass** last year's record.
  - India's overall exports (merchandise + services) are estimated to reach USD 776.68 billion.
  - This represents a **positive growth of 0.04%** over the previous fiscal year (FY 2022-23).
  - Despite global challenges, this figure slightly edges out the USD 776.40 billion recorded in FY 2022-23.

Note:

Table 1: Trade during March 2024*

		March 2024 (USD Billion)	March 2023 (USD Billion)
Merchandise	Exports	41.68	41.96
	Imports	57.28	60.92
Services*	Exports	28.54	30.44
	Imports	15.84	16.96
Overall Trade (Merchandise +Services) *	Exports	70.21	72.40
	Imports	73.12	77.88
	Trade Balance	-2.91	-5.48

* Note: The latest data for services sector released by RBI is for February 2024. The data for March 2024 is an estimation, which will be revised based on RBI's subsequent release. (ii) Data for FY 2022-23 (April-March) and April-December 2023 has been revised on pro-rata basis using quarterly balance of payments data.

➢ **Merchandise Export Drivers:** Key contributors to merchandise export growth include:
  ○ **Electronic Goods:** Exports increased by 23.64% to USD 29.12 billion.
  ○ **Drugs & Pharmaceuticals:** Exports rose by 9.67% to USD 27.85 billion.
  ○ **Engineering Goods:** Exports grew by 2.13% to USD 109.32 billion.
➢ **Agricultural Commodities Show Positive Growth:**
  ○ Exports of **agricultural commodities**, such as tobacco, fruits, vegetables, meat, dairy products, spices, and oil seeds, exhibited positive growth in FY 2023-24.
➢ **Trade Deficit Improvement:**
  ○ The overall **trade deficit** is estimated to significantly improve by 35.77% to USD 78.12 billion in FY 2023-24.
  ○ Merchandise trade deficit improved by 9.33% to USD 240.17 billion compared to FY 2022-23.
➢ **Current Account Balance Outlook:**
  ○ The easing of the goods trade deficit in March is expected to augur well for the **current account balance** in the final quarter of FY 2023-24.

What Should be the Strategy to Further Enhance India's Exports?

➢ **Cost Optimisation:**
  ○ **Land, Power, and Capital Costs:** The government must urgently address **cost-related challenges** associated with **land acquisition**, power tariffs, and capital availability.
  ○ **Scale and Efficiency:** Encouraging **economies of scale** can significantly reduce cost disabilities for businesses.
➢ **Enhancing Competitiveness:**
  ○ **Infrastructure and Logistics:** Improving transportation networks, **ports**, and warehousing facilities will enhance supply chain efficiency.
  ○ **Labour Flexibility:** Streamlining **labour laws** and ensuring flexibility can make Indian companies more competitive.
  ○ **MSME Support:** Strengthening **Micro, Small, and Medium Enterprises (MSMEs)** will contribute to overall competitiveness.
➢ **Market Access via Trade Treaties:**
  ○ India should actively **negotiate and sign trade agreements** with key trading partners to facilitate market access for its exports.
  ○ **Bilateral and multilateral treaties** can open up new avenues for Indian products globally.
➢ **Technology and Quality Focus:**
  ○ Investing in **research and development (R&D)** and adopting advanced technologies will enhance product quality.
  ○ **Quality certifications** and adherence to international standards are crucial for gaining consumer trust.

Note:

➢ **Promoting Brand India:**
   ○ The government and industry bodies should collaboratively promote **"Brand India"** on the global stage.
   ○ Highlighting **India's rich cultural heritage**, skilled workforce, and innovative capabilities will attract international buyers.
➢ **China Plus One Strategy:**
   ○ Encouraging multinational companies to diversify their manufacturing base away from China is essential.
   ○ India can position itself as an attractive alternative for investment and production.
➢ By implementing these strategies, India can not only sustain its export growth but also **surpass previous records**, contributing to economic prosperity and global trade dynamics

Banks See Worst Deposit Crunch in 20 Years

Why in News?

A recently released report revealed that despite robust **credit growth**, Indian banks faced difficulty in garnering deposits in 2023-24, resulting in the **highest credit-deposit ratio** in at least **two decades.**

What is the Deposit Crunch?

➢ **About:**
   ○ **Indian banks** are grappling with a severe deposit cash crunch that has not been witnessed in the past two decades.
   ○ Currently standing at 80%, the credit-deposit ratio is at its **highest** since 2015.
     ● The **CD ratio** indicates how much of a bank's deposit base is being **utilized for loans.**
➢ **Deposit Cash Crunch:**
   ○ A deposit cash crunch occurs when banks have **insufficient funds** on hand to lend to their customers.
   ○ As a result, businesses face challenges in operating smoothly, and employees may experience delays in receiving their salaries.
   ○ This **ripple effect** can disrupt economic stability and financial well-being.

➢ **Reasons for the Deposit Crunch:**
   ○ Investors are increasingly pursuing high-return, **equity-linked products** due to strong market performance and growing financial awareness, presenting banks with the **dual challenge of attracting deposits and supporting credit growth.**
   ○ A portion of mobilised deposits is also set aside for regulatory requirements such as **cash reserve ratio (CRR)** and **statutory liquidity ratio (SLR)**, reducing lendable funds and intensifying competition for deposits.
   ○ In recent quarters, banks used their surplus **SLR holdings to boost credit growth amid slower deposit growth**, but as SLR buffers shrink, they face the challenge of balancing deposit rate hikes with profitability.
   ○ Banks raised deposit rates last fiscal to attract retail deposits amidst rising competition, alternative investment options, and a **shift toward real assets.**
   ○ The **merger** of **HDFC and HDFC Bank** resulted in the incorporation of HDFC's loans and deposits into the banking system, contributing to the overall figures.
➢ **Implications:**
   ○ A high CD ratio **increases a bank's dependence** on costly, large deposits, which may not be from its core depositors, potentially leading to **liquidity risks** due to higher outflows.
   ○ Businesses may face liquidity challenges due to **limited access** to credit.
   ○ Workers' salaries could be delayed, affecting their livelihoods.
   ○ The overall economic impact may be significant, **necessitating urgent measures** to stabilise the banking sector.
➢ **Solutions:**
   ○ The worst deposit crunch in nearly 20 years demands immediate attention and strategic interventions.
   ○ As India navigates this challenging phase, safeguarding our banks and ensuring financial stability remains paramount.
   ○ The **RBI** and banks must collaborate to find solutions.
   ○ Encouraging higher deposits and **managing loan disbursements** effectively are crucial steps.
   ○ **Public awareness** about the severity of the crisis can drive collective efforts to safeguard our banking system.

∎∎∎

Note:

International Relations

Highlights

- Iran-Israel Conflict
- US Priority Watch List
- UK Passes Bill to Deport Asylum Seekers to Rwanda

Iran-Israel Conflict

Why in News?

The conflict between Israel and Iran has created a situation of turmoil affecting the security of the large Indian diaspora based in the **Gulf region.**

➢ **Iran** has launched significant attacks on **Israel,** deploying over 300 projectiles, including drones, cruise missiles, and ballistic missiles. This action was widely seen as retaliation for a deadly strike on Iran's consulate in Damascus, Syria.

➢ This has created the additional risk of **piracy** and hostage-taking in the Gulf region.

Iran-backed groups in the Middle East and major US military deployments

Lebanon
Hezbollah is the most powerful militia in the region; it is armed, trained and funded by Iran.

Syria
Iran has a direct presence in Syria and backs groups that have attacked US forces on the ground since the war began. The US has responded with retaliatory strikes.

Iraq
Iran wields significant influence over several militias, who have launched dozens of attacks on US forces in Iraq since mid-October; the US has responded with retaliatory strikes.

Iran
In April, for the first time, Iran launched a direct assault on Israel in retaliation to an Israeli strike on its consulate in Damascus, Syria, earlier in the month.

TURKEY 1,465
SYRIA 800
LEBANON
ISRAEL
GAZA
JORDAN 3,000
IRAQ 2,500
IRAN
AFGHANISTAN
KUWAIT 13,500
BAHRAIN 9,000
PAKISTAN
SAUDI ARABIA 2,700
QATAR 10,000
UAE 3,500
OMAN
SUDAN
Red Sea
YEMEN

Gaza
Iran backs Hamas and the Palestinian Islamic Jihad group, which have launched attacks on Israel.

Yemen
Iran-backed Houthi rebels have been striking ships in the Red Sea, disrupting global shipping. The US and UK have responded by striking Houthi targets in the Red Sea and Yemen.

Approximate number of US troops
1,000 military personnel
US Navy presence
Recent attacks
Attacks by Iran
Attacks by Iran-linked groups
Attacks by US
Attacks by Israel

Note:

drishti

What are the Reasons for the Iran-Israel Conflict?

➢ **Historical Context:** Iran and Israel have had a tumultuous relationship since the **Iranian Revolution** of 1979, which transformed Iran from a close ally of Israel under the rule of the Shah to an Islamic Republic openly hostile towards Israel.

➢ **Religious and Ideological Differences**: Iran is an Islamic republic governed by Shia Islam, while **Israel** is a predominantly Jewish state.

  ❍ The religious and ideological differences between the two countries have contributed to mutual suspicion and animosity.

➢ **Israeli-Palestinian Conflict**: Iran has been a staunch supporter of **Palestinian** causes, including backing militant groups like **Hamas** and **Hezbollah**, which are considered terrorist organisations by Israel.

  ❍ Iran's support for these groups and its calls for the destruction of Israel have heightened tensions.

➢ **Geopolitical Rivalry:** Iran and Israel are regional rivals vying for influence in the Middle East. They have conflicting interests in various regional conflicts, including the civil wars in Syria and Yemen.

  ❍ Where Iran supports the Assad regime and **Houthi rebels**, respectively, while Israel opposes Iranian influence in these countries.

➢ **Nuclear Program:** Israel views Iran's nuclear program with great concern, fearing that Iran may develop nuclear weapons that could pose an existential threat to Israel's security.

  ❍ Israel has been a vocal critic of the Iran nuclear deal (**Joint Comprehensive Plan of Action)** and has taken measures, including covert operations, to disrupt Iran's nuclear activities.

➢ **Proxy Conflicts:** Iran and Israel have engaged in proxy conflicts through their support for opposing factions in neighbouring countries.

  ❍ For example, Iran's support for **Hezbollah** in **Lebanon** and for Shia militias in Iraq has been perceived as a threat by Israel.

➢ **Regional Power Dynamics:** The balance of power in the **Middle East** is shaped by the competition between Iran and its allies on one side and Israel and its allies on the other.

  ❍ This competition has contributed to a cycle of tensions and conflicts in the region.

What are the Recent Events that have Given the Israel-Iran Rivalry a New Dimension?

➢ **Withdrawal from Iran's Nuclear Deal:** In 2018, Israel praised the US decision to withdraw from the Iran nuclear deal **Joint Comprehensive Plan of Action (JCPOA)**, which it had lobbied against for years, considering it a significant move.

➢ **Assassination of Iran's Army General:** In 2020, Israel supported the US drone strike in Baghdad that killed **General Qassem Soleimani,** a top Iranian military commander, prompting retaliatory missile attacks from Iran on Iraqi bases housing American troops.

➢ **Hamas Missile Attack:** In October 2023, **Hamas**, an Iran-backed group, launched a missile attack on Israel, prompting Israeli airstrikes on Gaza in response to perceived threats from Hamas operating in civilian areas.

➢ **Houthi Group's Red Sea Incident:** Since November 2023, the **Iran-backed Houthi group from Yemen** has targeted several ships related to Israel and its allies in the **Red Sea**, **triggering the 'Red Sea Crisis'** and causing disruptions to supply chains.

➢ **Airstrike on the Iranian Embassy and Iran's Retaliation:** Suspected Israeli airstrikes targeted the Iranian embassy compound in **Syria**, resulting in casualties and in retaliation Iran launched a missile attack on Israel in April 2024, marking a significant escalation in direct hostilities between the two nations.

Note:

What are the Implications of the Iran-Israel Conflict on India?

➢ **Economic Implications:**
  ❍ Conflict between Israel and oil-rich Iran could disrupt oil supply from the region, leading to a **rise in oil prices** globally.
  ❍ India imports around 2 million barrels of crude oil daily through the strategic **Strait of Hormuz**located at the mouth of the **Persian Gulf.**Any conflict or instability in the region would lead to supply shortages and increasing energy costs leading to inflation and constraining **Economic Growth** in India.

➢ **Diaspora**: Large Indian diaspora in West Asia, and particularly the **Persian Gulf** might be affected due to the tension in the region.
  ❍ Their safety will have to be a priority. India has in the past organised big evacuations- famously from **Kuwait at the time of the first Gulf War**, and more recently from Libya and Ukraine.

➢ **Connectivity:** The strategic connectivity interests of India might be affected. This includes the port of Chabahar in Iran, linking India to Afghanistan and Central Asia.
  ❍ Shipping disruption in the **Red Sea** would affect the trade in the region.
  ❍ A disturbance here could lead to delays, increased shipping costs, and instability in global trade.

➢ **Diplomatic Challenges for India:**
  ❍ Over the decade, India has had good relations with Israel and has leveraged Israeli expertise in defence, technology and **start-ups.**

Note:

❍ The problem is that if the war effort intensifies, then India may have to take sides. That will not be a very comfortable situation to have. Of course, India can always take the middle path or the neutral stance, but that does not yield dividends any longer.

Efforts Taken to bring Peace between Israel and Its Neighbours

➢ **Oslo Accords:** The **Oslo Accords** in 1993, facilitated by the US, were a significant milestone in Israeli-Palestinian peace efforts, although the peace process has since stalled.

➢ **Abraham Accord:** The **Abraham Accord** was signed in 2020 between **Israel, the United Arab Emirates** and **Bahrain** and was **mediated by the US**.

➢ **I2U2:** **I2U2** stands for **India, Israel, USA and the UAE.** It was formed in October 2021 following the **Abraham Accords** between Israel and the UAE, to deal with issues concerning **maritime security**, infrastructure and transport in the region.

➢ **United Nations:** The United Nations has been actively involved in efforts to resolve the Israel-Palestine conflict through its various agencies, including the **UN Security Council** and the **UN General Assembly.**

　❍ The UN has repeatedly called for a **two-state solution** based on the pre-1967 borders, with East Jerusalem as the capital of Palestine.

➢ **Arab Peace Initiative:** Arab states have also played a role in peace efforts, particularly through the **Arab Peace Initiative.**

　❍ This initiative, first proposed by Saudi Arabia in 2002 and later endorsed by the **Arab League**, offers Israel normalised relations with Arab states in exchange for a full withdrawal from the occupied territories and a just resolution to the Palestinian refugee issue.

➢ **India's Role:**

　❍ **Diplomatic Relation**: India has historically maintained diplomatic relations with both Israel and various Arab states including Palestine.

　❍ **Two-State Solution:** India has consistently advocated for a two-state solution to the **Israeli-Palestinian conflict,** which envisions the creation of an independent Palestinian state alongside Israel, based on the pre-1967 borders with **East Jerusalem** as the capital of Palestine.

　　● India's support for this solution aligns with the consensus view of many global leaders and organisations.

❍ India has participated in multilateral forums addressing Middle East issues, such as the **United Nations General Assembly** and the **Non-Aligned Movement (NAM).**

　● Within these forums, India has voiced its support for peaceful resolution of conflicts in the region, including the **Israeli-Palestinian** conflict, and has called for dialogue and negotiations to achieve lasting peace.

❍ **Humanitarian Assistance:** India has provided humanitarian assistance to Palestinians through various channels, including contributions to **UN agencies** and support for development projects in Palestinian territories.

　● This assistance aims to alleviate the humanitarian suffering of Palestinians and contribute to stability in the region.

US Priority Watch List

Why in News?

Recently, the United State's **USTR Special 301 Report** has again included India in the **'Priority Watch List' (PWL)** of countries, along with China, Russia, Venezuela, and three others due to concerns about **Intellectual Property (IP)** protection and enforcement.

➢ Over the years, **including 2020 and 2021, India has been listed in the USTR Special 301 Report**.

What is the USTR's Special 301 Report?

➢ **About:**

　❍ Mandated by Section 182 of the **US Trade Act of 1974**, it is an **annual review** conducted to assess the adequacy and effectiveness of US trading partners' IP protection and **enforcement practices.**

➢ **Designation Criteria:**

　❍ The USTR considers factors like the **severity of IP concerns**, the economic impact on US rights holders, and the lack of progress made in addressing **identified issues** when designating countries to the PWL or Watch List.

　　● **Priority Watch List (PWL):** Countries on the PWL face the **most serious allegations** of inadequate IP protection and enforcement. The USTR may initiate **formal trade investigations** or impose sanctions if they fail to demonstrate significant improvements.

　　● **Watch List:** Countries placed on the Watch List have some concerning IP practices, but the **issues may not be as severe** as those on the PWL. The

USTR uses the Watch List to monitor countries and encourage them to strengthen their IP regimes.

- ➤ **US Government Initiatives:**
  - ❍ **Advocacy Efforts:** The USTR employs bilateral negotiations, **World Trade Organisation (WTO)** participation, and stakeholder engagement to bolster IP protection with trading partners.
  - ❍ **Technical Assistance:** The US strengthens developing countries' IP systems through training for legal and administrative personnel.
  - ❍ **Anti-Counterfeiting and Piracy Efforts:** The USTR fights counterfeiting and piracy through joint actions, information exchange, and capacity building with partner nations and organizations.

What are the Concerns Raised Related to India in the Report?

- ➤ **India's Placement:** India has **consistently been placed** on the 'priority watch' list in the Special 301 Report, indicating **significant concerns** regarding IP protection, enforcement, and market access for American IP stakeholders.
  - ❍ As per the report, India remains one of the most challenging major economies concerning IP protection and enforcement.
- ➤ **Inadequate IP Enforcement:** The USTR report identifies various shortcomings in India's IP enforcement, including **high rates of online piracy**,

a significant backlog in **trademark opposition cases**, and **insufficient legal mechanisms** for protecting trade secrets.

- ❍ These include high customs duties on IP-intensive products and concerns over whether India has an effective mechanism for the early resolution of potential pharmaceutical patent disputes.
- ➤ **Copyright Compliance Issues:** India should fully implement **World Intellectual Property Organisation (WIPO)** Internet Treaties and avoid extending copyright licenses to interactive transmissions to protect copyright holder rights.
  - ❍ Interactive Transmissions are transmissions where the user actively participates, such as streaming music or downloading videos.
- ➤ **US-India Trade Policy Forum:** While some progress has been noted under the US-India Trade Policy Forum regarding issues like **trademark infringement** investigations and pre-grant opposition proceedings, several longstanding concerns remain unaddressed.
- ➤ **India's Stand on Intellectual Property Rights:** India's stance is that its laws are in strict adherence to the World Trade Organisation's **Trade-Related Aspects of Intellectual Property Rights (TRIPS)** Agreement, and it is **not obligated to make changes** as per other international rules.

INTELLECTUAL PROPERTY RIGHTS (IPRs)

IP refers to intangible assets owned/legally protected by an individual/company from outside use or implementation without consent.

NEED FOR IPR

- Encourages Innovation
- Economic growth
- Safeguard rights of creators
- Enhances ease of doing business

RELATED CONVENTIONS/TREATIES (INDIA SIGNATORY TO ALL)

- WIPO Administered (first recognised IPR under):
  - Paris Convention for the Protection of Industrial Property 1883 (**Patents, Industrial Designs**)
  - Berne Convention for the Protection of Literary and Artistic Works 1886 (**Copyrights**)
- WTO - TRIPS Agreement:
  - Ensures adequate standard of protection
  - Argues for incentives for technology transfer to developing countries
- Budapest Treaty 1977:
  - International recognition of the deposit of micro-organisms for the purposes of patent procedure
- Marrakesh VIP Treaty 2016:
  - Facilitate access to published works by visually impaired persons and persons with print disabilities
- IPR also outlined in **Article 27** (Universal Declaration of Human Rights)

INDIA AND IPRS - INITIATIVES

- National IPR Policy 2016:
  - Motto: "Creative India; Innovative India"
  - Compliant with TRIPS Agreement
  - Brings all IPRs to single platform
  - Nodal Dept - Department of Industrial Policy & Promotion (Ministry of Commerce)
- National (IP) Awareness Mission (NIPAM)
- Kalam Program for Intellectual Property Literacy and Awareness Campaign (KAPILA)

World Intellectual Property Day: 26th April

Intellectual Property	Protection	Law in India	Duration
Copyright	Expression of Ideas	Copyright Act 1957	Variable
Patent	Inventions- New Processes, Machines, etc.	Indian Patent Act 1970	20 years Generally
Trademarks	Sign to distinguish business goods or services	Trade Marks Act 1999	Can last Indefinitely
Trade Secrets	Confidential Business Information	Protected without Registration	Unlimited time
Geographical Indication (GI)	Sign used on specific geographical origin and possess qualities due to site of origin	Geographical Indications of Goods(R & P) Act, 1999	10 years (Renewable)
Industrial Design	Ornamental or aesthetic aspect of an article	Design Act, 2000	10 years

Drishti IAS

UK Passes Bill to Deport Asylum Seekers to Rwanda

Why in News?

Recently, the **United Kingdom** government has passed a **controversial bill** to send **asylum seekers** to Rwanda in an effort to **curb** the **number of asylum seekers** crossing the **English Channel.**

What is the Rwanda Bill?

➢ **About:** The **Safety of Rwanda (Asylum and Immigration) Bill** in the United Kingdom originated from a policy initiated by a former UK Prime Minister in 2022.

  ○ Its main aim is to enable the deportation of undocumented immigrants to Rwanda by designating it as a **safe third country.**

    ● Safe third country implies that asylum seekers can be sent to a country other than where they seek asylum or where they belong, if it Is deemed safe.

  ○ However, global consensus on this concept is lacking, leading to apprehensions about its implementation.

➢ **U.K.-Rwanda Deal on Refugees:** In April 2022, the former UK Prime Minister introduced the **Migration and Economic Development Partnership (MEDP)**, aimed at relocating asylum seekers unrecognised by the UK to Rwanda.

  ○ Under the **Memorandum of Understanding (MoU)** between the two countries, the UK assesses asylum applications and arranges transportation to Rwanda.

    ● Rwanda then takes over, **providing shelter and protection,** with the sole power to grant refugee status, those denied are returned to their home countries.

➢ **Criticism:**

  ○ **Wider Ramifications:** The bill **circumvents existing human rights** statutes and limits individuals' appeal options.

    ● It is **not an isolated incident,** with other European countries exploring similar agreements with third countries for processing asylum seekers.

  ○ **Human Rights Concerns:** Critics argue that Rwanda does not provide adequate protection for refugees and asylum seekers.

    ● The country has been **criticised for its human rights record like Rwandan genocide 1994**, including allegations of political repression and lack of freedom of expression.

    ● Criticism from the United Nations, Council of Europe's human rights watchdog and various NGOs reflects widespread concern over its impact on human rights and asylum seekers, extending beyond the UK's borders.

  ○ **Lack of Safeguards:** Critics argue that the bill **lacks sufficient safeguards** to protect the rights of asylum seekers.

    ● There are concerns that individuals deported to Rwanda may not have access to **fair and effective asylum procedures**, leaving them vulnerable to arbitrary detention and deportation.

➢ **Refugee Crisis in UK:** Despite the dangers, a notable number of refugees and asylum-seekers have perished in 2023 attempting to reach the UK.

➢ Their decision to undertake these risky journeys is often driven by a mix of economic hardship, political persecution, and worsening impacts of climate change, such as environmental degradation and natural disasters.

➢ Crossing the **English Channel** in overcrowded and unsafe boats symbolises their desperation and aspiration for a brighter tomorrow.

Note:

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What is the Difference Between Asylum Seeker, Refugee, Illegal Migrant?

➢ **Asylum Seeker:** According to the **United Nations High Commissioner for Refugees (UNHCR)**, an asylum-seeker is someone who has fled their home country and is seeking protection in another country. Their claim for refugee status has **not yet** been **decided.**

➢ **Refugee:** The **1951 Refugee Convention** defines a refugee as someone who has been forced to flee their country because of a well-founded fear of persecution based on race, religion, nationality, political opinion, or membership in a particular social group.

  ❍ The **core principle** of the 1951 Convention is **non-refoulement**, which asserts that a refugee should not be returned to a country where they face serious threats to their life or freedom.

➢ **Illegal Migrant:** The term "illegal migrant" is **not an official legal term,** but it generally refers to someone who is present in a country **without authorization**. This could include someone who entered the country without proper documentation or someone who has overstayed a visa.

What are the Regulations Related to Refugees in India?

➢ India treats all foreigners whether illegal immigrants, refugees/asylum seekers or those overstaying visa permits under

  ❍ **Foreigners Act of 1946:** Under Section 3, the central government is empowered to **detect, detain and deport** illegal foreign nationals.

  ❍ **Passport (Entry into India) Act, 1920:** Under Section 5, authorities can remove an illegal foreigner by force under **Article 258(1)** of the Constitution of India.

Note:

❍ **Registration of Foreigners Act of 1939:** Under this, there is a mandatory requirement under which all foreign nationals (excluding overseas citizens of India) visiting India on a **long-term visa** (more than 180 days) are required to register themselves with a Registration Officer within 14 days of arriving in India.

❍ **Citizenship Act, 1955:**It provided provisions for renunciation, termination, and deprivation of citizenship.

● Further, **Citizenship Amendment Act, 2019 (CAA)** seeks to provide citizenship to Hindu, Christian, Jain, Parsi, Sikh, and Buddhist immigrants persecuted in Bangladesh, Pakistan, and Afghanistan.

➢ Also, a **Standard Operating Procedure (SoP)** was issued in **2011** by the Central Government and amended in **2019** which has to be followed by law enforcement agencies while dealing with foreign nationals who claim to be refugees.

What are the Reasons for India's Not Signing the 1951 Refugee Convention?

➢ The 1951 convention defines refugees as those **deprived of civil and political rights,** excluding economic rights.

❍ India asserts that Including economic rights in the definition could burden developing nations.

➢ Adhering to the convention could heighten responsibilities and resource demands for hosting refugees, a concern amplified by **India's history of refugee inflows** due to regional conflicts and porous borders.

➢ India's decision not to sign the convention allows it to control its refugee policies, that could otherwise impact its sovereignty and domestic plans.

➢ Nonetheless, **India abides by other international human rights treaties** and customary law, showcasing a commendable track record in upholding international legal norms.

■■■

Note:

Social Issues

Highlights

- *State of Medical Education in India*
- *Impact of Climate Change on Occupational Safety and Health*
- *50 Years of Chipko Movement*
- *Gender Gap in Indian STEM Faculties*
- *No Age Bar for Health Insurance in India*
- *Patient Safety Rights Charter*
- *Protection of Women from Domestic Violence*

State of Medical Education in India

Why in News?

The Ukraine-Russia war apart from other difficulties and hardships has led to tough times for Indian medical students in Ukraine. In February 2022, about 18000 Indian medical students studying in Ukraine were forced to return home after the country's conflict with Russia escalated into a war.

➢ As a one-time exception, the **National Medical Commission** allowed 4,000 of these students, who were in their final semesters, to complete their internship at home.

➢ According to a report, **around 70% of these repatriated MBBS students** are now pursuing their courses from colleges in Serbia, Kyrgyzstan, Uzbekistan and Georgia.

➢ These colleges are also attracting students' new batches of students from India to pursue medical education.

What are the Challenges Related to Medical Education in India?

➢ **Limited Number of Seats:** Medical college seats are still far less than the number of aspirants. The **ratio of medical college seats to aspirants is about 20:1.**

➢ **Increase in Number of Aspirants**: As per the study conducted by the National Institute of Educational Planning, the **number of students taking the test** has increased by **almost 3 times in the past 10 years** and only 0.25% make it to the top colleges.

➢ **Uneven Distribution of Medical Colleges**: Medical colleges in India are concentrated in urban areas which creates a **vacuum in the rural areas.**

➢ **High Fees of Private Medical Colleges**: Government institutions are more affordable in terms of fees and education quality.

➢ **Outdated Curriculum:** The curriculum of many medical colleges in India is outdated and not aligned with current medical practices. This leads to a gap between what students learn in medical school and the skills required in clinical practice.

➢ **Lack of Infrastructure:** Many medical colleges in India lack the necessary infrastructure to provide high-quality medical education. This includes modern laboratories, advanced medical equipment, and access to technology.

➢ **Insufficient Emphasis on Practical Training:** Medical education in India is often theory-based, with insufficient emphasis on practical training. This can result in doctors graduating without sufficient practical experience.

➢ **Poor Medical Research**: There is less emphasis on medical research in India as compared to other developed nations. Mostly, doctors in India prefer to take jobs after completion of their education, thus research is neglected.

National Medical Commission (NMC):

➢ The NMC has been constituted by an act of Parliament known as the **National Medical Commission Act, 2019.**

➢ The NMC acts as India's top regulator of medical education and practice.

➢ Committed to upholding the highest standards in healthcare education, NMC ensures the delivery of quality medical education and training across the nation.

What Initiatives have been Taken to Reform Medical Education?

➢ **National Medical Commission**: The inefficient and opaque Medical Council of India (MCI) has been completely overhauled, establishing the **National Medical Commission (NMC)** of the highest standards in professional integrity, experience, stature, and excellence.
  ❍ Competent individuals have been carefully selected and placed at the helm to further steer these reforms.
➢ **Raising the Number of Seats:** The Government is scaling up the number of seats by converting district hospitals into medical colleges using a private-public partnership model.
➢ **Regulation of Fees:** The **National Medical Commission (NMC) Act** has the provision to regulate fees and all other charges in 50% of the seats in private medical colleges and deemed universities. NMC is framing guidelines in this regard.
➢ **One Country One Exam**: For MBBS admissions, the **National Eligibility cum Entrance Test (NEET)** was introduced in 2016, which ensured 'one country, one examination, one merit' system and a common counselling system.
➢ **Minimum Standard Requirement**: It pertains to streamlining the entire regulations on Minimum Standards Requirement (MSR) for the establishment of medical colleges.
➢ **Regular Quality Assessments:** Quality assessments of medical colleges should be regularly conducted, and reports should be available in the public domain. The NMC is conducting a common exit exam for all medical undergraduates as a quality control measure.

What are Recommendations for Improving the Quality of Medical Education in India?

➢ **NITI Ayog** proposed to **link private colleges to district hospitals** to serve the underserved areas of the country.
➢ **Enhancing the skills of Paramedics and nurses** will help to cater to non-specialist demands of the medical sector and could t**ackle the problem of shortage of doctors**.
➢ **Public investment** for starting medical colleges can be encouraged along with encouraging the private sector to set up medical colleges, with appropriate incentives.
➢ **Optimal use of existing infrastructure** to expand medical education facilities.
➢ Adopting a comprehensive **India-specific approach** for the creation of seats for specialists.
➢ To **prevent the presence of 'ghost faculty' (**teachers who exist only on paper but are paid a salary) in medical colleges, streamlining the recruitment process is imperative.
➢ **Regular performance evaluations** of colleges to identify and address concerns promptly.

Impact of Climate Change on Occupational Safety and Health

Why in News?

A recent report by the **International Labour Organization (ILO)** stated that climate change is significantly affecting **occupational safety and health (OSH)** worldwide, with workers facing increasing hazards but often having to work in dangerous conditions.

What are the Impacts of Climate Change on Occupational Safety and Health?

Occupational Hazard	Industries Affected	Health Risks	Impact
Excessive Heat Exposure	Agriculture, environmental services, construction, etc.	Heat stress, heatstroke, **rhabdomyolysis (muscles break down), cardiovascular** diseases, etc.	**2.41 billion workers exposed annually**, 22.85 million injuries, 18,970 work-related deaths
UV Radiation Exposure	Outdoor work like construction, agriculture, lifeguards, etc.	Sunburn, **skin cancers, weakened immune** systems, etc.	**1.6 billion workers exposed annually**, over 18,960 deaths from non-melanoma skin cancer alone

Note:

Extreme Weather Events	Emergency workers, construction, agriculture, etc.	Varied risks due to extreme weather events	Many parts of India, Bangladesh, Thailand and Laos saw record-high temperatures in April, 2023.
Workplace Air Pollution	Outdoor workers, transport workers, firefighters, etc.	Lung cancer, respiratory diseases, cardiovascular diseases	**1.6 billion outdoor workers face increased exposure**, 860,000 work-related deaths annually due to air pollution
Vector-Borne Diseases	Outdoor workers such as farmers, landscapers, construction workers, etc.	Malaria, Lyme disease, dengue, among others	Limited data, **over 15,170 work-related deaths each year due to parasitic** and vector-borne diseases
Agrochemical Exposure	Agriculture, chemical industries, forestry, etc.	Poisoning, **cancer, neurotoxicity**, reproductive disorders, etc.	Significant risk for the 873 million workers in agriculture, **over 300,000 deaths annually due to pesticide poisoning**

Figure 5: Types of extreme weather events and their consequences
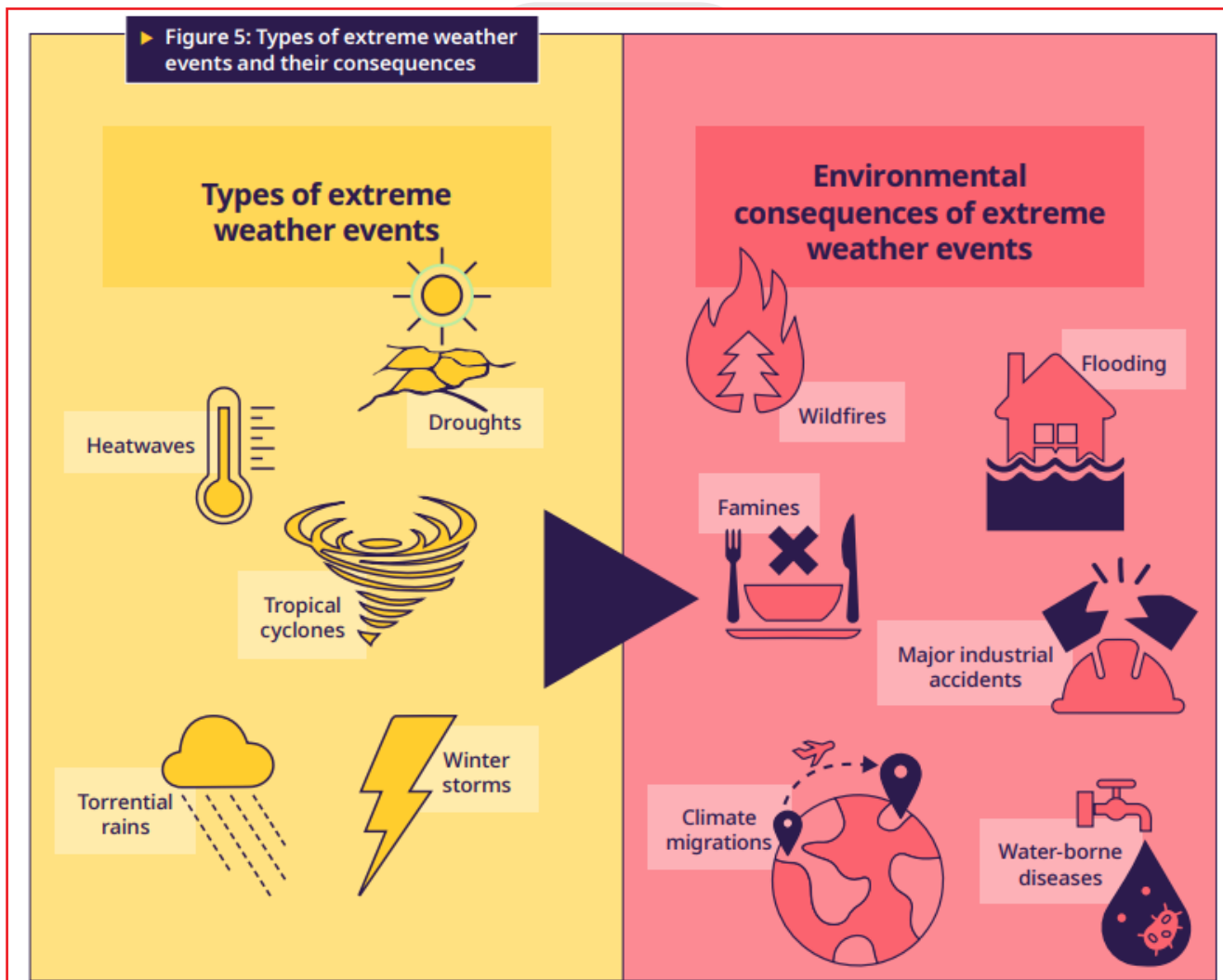
Note:

What are the Provisions Related to Labour Safety in India?

➢ **Constitutional Provisions:**
- **Concurrent List:Labour** is a subject in the Concurrent List where both the Central & State Governments are competent to enact legislation subject to certain matters being reserved for the Centre.
  - Entry No. 55 in this list mentions **"Regulation of labour and safety in mines and oil fields".**

Existing international labour standards and codes of practice related to climate change and OSH

General climate-related OSH hazards
- Occupational Safety and Health Convention, 1981 (No. 155)
- Occupational Safety and Health Recommendation, 1981 (No. 164)
- **Promotional Framework for Occupational Safety and Health Convention, 2006 (No. 187)**
- Promotional Framework for Occupational Safety and Health Recommendation, 2006 (No. 197)
- Occupational Health Services Convention, 1985 (No. 161)
- List of Occupational Diseases Recommendation, 2002 (No. 194)
- Safety and Health in Agriculture Recommendation, 2001 (No. 192)
- Hygiene (Commerce and Office) Recommendation, 1964 (No. 120)
- Workers' Housing Recommendation, 1961 (No. 115)
- Reduction of Hours of Work Recommendation, 1962 (No. 116)
- Protection of Workers' Health Recommendation, 1953 (No. 97)
- Safety and health in construction (revised 2022), Code of Practice
- Safety and health in shipbuilding and ship repair (revised 2019), Code of Practice
- Safety and health in ports (revised 2016), Code of Practice
- Safety and health in forestry (1998), Code of Practice
- Safety and health in opencast mines (1991), Code of Practice

Excessive heat
- Plantations Convention, 1958 (No. 110)
- Ambient factors in the workplace (2001), Code of practice

Ultraviolet (UV) radiation
- Ambient factors in the workplace (2001), Code of practice

Air pollution
- Working Environment (Air Pollution, Noise and Vibration) Convention, 1977 (No. 148)
- Working Environment (Air Pollution, Noise and Vibration) Recommendation, 1977 (No. 156)

Extreme weather events
- Prevention of Major Industrial Accidents Convention, 1993 (No. 174)
- Prevention of Major Industrial Accidents Recommendation, 1993 (No. 181)
- Employment and Decent Work for Peace and Resilience Recommendation, 2017 (No. 205)

Vector-borne diseases
- Workers' Housing Recommendation, 1961 (No. 115)
- Technical guidelines on biological hazards in the working environment (2022)

Agrochemicals
- Chemicals Convention, 1990 (No. 170)
- Chemicals Recommendation, 1990 (No. 177)
- Safety and Health in Agriculture Convention, 2001 (No. 184)
- Safety and health in agriculture (2010), Code of practice
- Safety in the use of chemicals at work (1993), Code of practice

- **Directive Principles of State Policy**:
  - **Article 39(e) of the Constitution** emphasises the protection of **workers' health,** irrespective of gender, and ensures that **children are not exploited due to their young age.**
    - It also aims to **prevent individuals from being compelled by economic circumstances** to engage in occupations that are not suitable for their physical abilities.
  - **Article 42** mandates that the State shall make provisions for securing just

Note:

- and humane conditions of work and for maternity relief.
- **Article 43** outlines the State's responsibility to ensure that all workers, whether in agriculture, industry, or other sectors, **receive a wage that allows for a decent standard of living**.
  - This includes conditions of work that enable a satisfactory quality of life, adequate leisure time, and access to social and cultural opportunities.
  - Additionally, the State should work towards promoting cottage industries either individually or cooperatively in rural areas.
- ○ **Legislative Provisions:** The **Occupational Safety, Health, and Working Conditions Code of 2020** delineates responsibilities for employers and employees, sets safety standards across sectors, addresses **worker health, working hours, and leave policies.**
  - The **Labour Bureau** under the **Ministry of Labour and Employment** in India compiles statistics on industrial accidents and oversees occupational safety.
- ○ **International Commitments:** India has ratified **47 International Labour Organization conventions** along with 1 protocol. Currently, 39 conventions are in force.
  - The major conventions related to worker's health include, the Medical Examination of Young
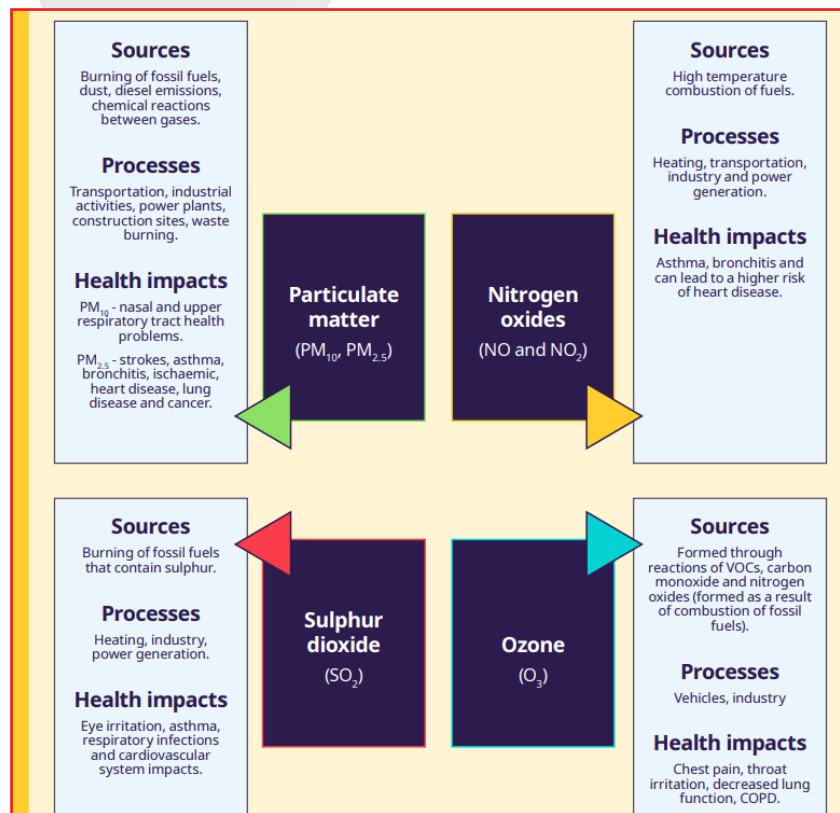
Persons (Sea) Convention, 1921, Equality of Treatment (Accident Compensation) Convention, 1925, Protection Against Accidents (Dockers) Convention (Revised), 1932.

What are the Temperature Limits Related to Workplace in Different Countries?

Country	Temperature Limits
India	Wet Bulb Globe Temperature (WBGT) should not exceed 30°C in factory workrooms
China	Work stoppage above 40°C outdoor temperature
Singapore	The temperature in working chambers should not exceed 29°C
Brazil	Work stoppage above WBGT of 29.4°C for low intensity

Note:

➤ The **Indian National Disaster Management Authority**, along with the Ministry of Home Affairs, issued guidelines for **managing heatwaves to safeguard workers.**

➤ These guidelines stress educating workers, ensuring hydration, regulating schedules, and providing medical facilities.

➤ Special consideration is advised for pregnant workers and those with health issues. Dressing in light, breathable clothing and using umbrellas or hats is recommended.

Particulate matter $(PM_{10}, PM_{2.5})$
Sources: Burning of fossil fuels, dust, diesel emissions, chemical reactions between gases.
Processes: Transportation, industrial activities, power plants, construction sites, waste burning.
Health impacts: PM_{10} - nasal and upper respiratory tract health problems. $PM_{2.5}$ - strokes, asthma, bronchitis, ischaemic, heart disease, lung disease and cancer.

Nitrogen oxides $(NO$ and $NO_2)$
Sources: High temperature combustion of fuels.
Processes: Heating, transportation, industry and power generation.
Health impacts: Asthma, bronchitis and can lead to a higher risk of heart disease.

Sulphur dioxide (SO_2)
Sources: Burning of fossil fuels that contain sulphur.
Processes: Heating, industry, power generation.
Health impacts: Eye irritation, asthma, respiratory infections and cardiovascular system impacts.

Ozone (O_3)
Sources: Formed through reactions of VOCs, carbon monoxide and nitrogen oxides (formed as a result of combustion of fossil fuels).
Processes: Vehicles, industry
Health impacts: Chest pain, throat irritation, decreased lung function, COPD.

50 Years of Chipko Movement

Why in News?

Recently, 50 years have been completed for the **Chipko Movement**, the landmark environmental movement that was started in Uttarakhand in 1973.

What was the Chipko Movement All About?

➢ **Origin:**

○ The movement started in the 1970s in Chamoli, Uttarakhand when the region was facing **rampant deforestation due to commercial activities** by outside contractors.

○ It started when the women from the **Himalayan** villages of Reni and Mandal hugged trees in the nearby forests to protect them from commercial loggers.

➢ **About:**

○ The name of the movement **'chipko'** comes from the word '**embrace**', as the **villagers hugged the trees and encircled them** to prevent being hacked.

○ By hugging they gave a clear message that **"We, our nature and us, are One"**.

○ It was a **non-violent agitation** to protect nature.

○ Its biggest victory was making people aware of their rights to forests, and how **grassroots activism can influence policy-making** regarding ecology and shared natural resources.

● It **led to a ban on commercial felling of trees above 30 degrees slope** and above 1,000 msl (mean sea level) in 1981.

➢ **Key Figures and Leaders:**

○ **Chandi Prasad Bhatt:** He was a Gandhian Social Activist and Environmentalist active during the early phase of the movement.

● He founded an organisation called **Dasholi Gram Swarajya Mandal (DGSM)**.

● It played an instrumental role in shaping the movement and uniting villagers against unsustainable deforestation.

○ **Sundarlal Bahuguna:** He was inspired by the Gandhian philosophy of non-violence and socialism.

● He played a crucial role in organising the local communities and spreading awareness about the importance of forests.

● His efforts were **instrumental in mobilising people.**

○ **Gaura Devi:** She was a village woman who became an icon of resistance.

● She led a group of women in the village of Reni to confront the loggers and physically embrace the trees, effectively preventing their cutting.

● With that, **Chipko became mainly a women led movement**. This inspired women in the other parts of the country as well.

➢ **Philosophy Behind the Movement:**

○ **Gandhian Philosophy** of **non-violence** and living in harmony with nature.

○ **Empowering the local communities** and giving them a voice in **decision-making** processes regarding their natural resources.

○ It aimed to challenge the exploitative practices of outside contractors and promote a more **inclusive and participatory approach** to forest management.

➢ **Impact:**

○ It inspired similar movements in different parts of India, such as the **Narmada Bachao Andolan, Appiko Movement (Karnataka)** and the **Silent Valley Movement**.

○ **Internationally**, the Chipko Movement became a **symbol of resistance** against environmental destruction.

Note:

drishti

○ The movement also i**nfluenced policy changes** in India, leading to stricter rules and regulations against illegal deforestation and the **rights of the indigenous communities.**

○ It is best remembered for the **collective mobilisation of women** for the cause of preserving forests, which also brought about a change in attitude regarding their own status in society.

➢ **Relevance of Chipko Movement in 2024:**

○ This movement continues to be a source of inspiration and a reminder of the power of collective action while tackling environmental challenges.

○ Its principles of **sustainability, community participation,** and **nonviolent resistance** remain relevant in the fight against **climate change** and the protection of our ecosystems.

○ It also serves as an inspiration for grassroots-level actions, **participation of women** and inclusion of **local communities** in the planning.

Other Similar Environmental Movements:				
Name of Movement	**Year**	**Place**	**Leaders**	**Details**
Bishnoi Movement	1700	Khejuli, Manvar region in Rajasthan	Amrita Devi	Used to hug trees to stop their felling.
Chipko Movement	1973	Uttarakhand	Sunderlal Bahuguna	The main objective was to protect the trees on the Himalayan slopes from the axes of contractors of the Tehri Dam project.
Silent Valley Movement	1978	Silent Valley, Kerala	Kerala Sastra Sahitya Parishad	A movement against the Silent Valley Hydroelectric Project. In November 1983, the Silent Valley Hydroelectric Project was canceled. In 1985, Prime Minister Rajiv Gandhi inaugurated the Silent Valley National Park.
Appiko Movement	1982	Kantipuza river in Singbhum district of Jharkhand	Tribals	Against government plans to replace the natural forest with Teak plantations.
Save Aarey Movement	2019	Aarey National Park in Mumbai	Medha Patkar, Arundhati Roy, and various NGOs	Against the felling of trees in the Aarey Colony for the Mumbai Metro Limited's (MMRLC) project.
Save Dehing-Patkai	Nov 2019	Dehing-Patkai Wildlife Sanctuary in Assam	Rohit Chaudhary, Adil Hussain, Randeep Hooda, and Joi Jadav Payeng	A movement against the decision by the National Board of Wildlife (NBWL) to allow mining in the Dehing-Patkai Sanctuary.

Note:

Save the Sundarbans	2019-2020	The Sundarbans, West Bengal	All Assam Students' Union and All Assam Matak Youth Students' Union	A campaign to raise awareness about the threats to the Sundarbans mangrove forest after Cyclone Amphan in May 2020.

Read more: Gaura Devi as Part of International Women's Day Celebrations

Gender Gap in Indian STEM Faculties

Why in News?

A significant **gender gap exists in Indian STEM(science, technology, engineering, and math) faculties,** with a BiasWatchIndia study revealing that only 13.5% of faculty members across 98 universities and institutes are women.

➢ This underrepresentation is more prominent in India compared to countries like the US and UK.

Why is there a Gender Gap in Indian STEM Faculties?

➢ **Social Bias Against Women in Certain STEM Fields:** Fields like Biology, seen as **"soft sciences,"** have higher female representation compared to hard sciences like Engineering and Physics.
   ○ **Societal biases discourage women** from pursuing fields perceived as less feminine, affecting their choices in higher education and research.

➢ **Lack of Support During PostDoc to Faculty Transition:** The critical transition from postdoc to faculty often aligns with family planning, leading to difficult choices for women.
   ○ Societal pressure **prioritising family over career ambitions** and a lack of support structures exacerbate the challenge.

➢ **Toxic Workplace Environment:** Many women exit STEM academia due to a toxic work environment.
   ○ Factors include **disrespect, inadequate access to resources,** and limited advancement opportunities compared to male colleagues.

➢ **Difficulty Accessing Gender Representation Data:** Absence of a central database tracking women faculty in STEM across India.
   ○ Lack of data hinders understanding of the gender gap and monitoring progress towards gender equality.

What are the Government Initiatives to Promote Women in STEM?

➢ **Women in STEMM (WiS) Program:** Launched by the **Department of Science and Technology(DST),** it provides scholarships, fellowships, and research grants to women in STEM. It also offers mentorship and networking opportunities.

➢ **Vigyan Jyoti:** It was introduced in 2019-20 to encourage meritorious girl students in classes 9-12 to pursue higher education and careers in STEM fields, addressing the underrepresentation of women in these areas.
   ○ Developed by the Department of Science and Technology, it offers workshops, mentoring, and resources for young women in STEM.
   ○ The program provides support from the school level to PhD level.

➢ **Women in Science and Engineering-KIRAN (WISE-KIRAN):** It encourages women scientists to **pursue research in frontier areas of science and engineering** and to address societal problems through S&T-based internship and self-employment opportunities.
   ○ Many well-qualified women face challenges in participating in S&T activities due to circumstances typically associated with gender, such as career breaks due to **motherhood and family responsibilities**.
   ○ To address these issues, the **DST will provide opportunities for women scientists and technologists aged 27-57** who have taken a career break but wish to return to mainstream work.

Note:

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International Day for Women and Girls in Science

ABOUT

- Celebrated every year on February 11 since 2015
- Observed by the United Nation to promote the full and equal access and participation of women in Science, Technology, Engineering and Mathematics (STEM) fields.

THEME 2023

- Innovate. Demonstrate. Elevate. Advance. Sustain (I.D.E.A.S.)

STATUS OF WOMEN PARTICIPATION IN THE SCIENCE SECTOR

- According to the All India Survey on Higher Education 2020-2021, number of science researchers in India has doubled from 30,000 in 2014 to over 60,000 in 2022.
- Women's participation is the highest in biotechnology at 40% and medicine at 35%.

INITIATIVES TAKEN FOR WOMEN IN SCIENCE

- **Gender Advancement for Transforming Institutions (GATI):**
  - To develop a comprehensive Charter and a framework for assessing Gender Equality in STEM.
- **Vigyan Jyoti Scheme:**
  - To create a level-playing field for the meritorious girls in high school to pursue STEM in their higher education.
- **Indo-US Fellowship for Women in STEMM (WISTEMM) program:**
  - Women scientists can work in research labs in the US.
- **Consolidation of University Research for Innovation and Excellence in Women Universities (CURIE) Programme:**
  - Improving R&D infrastructure and establishing state-of-the-art research facilities in order to create excellence in S&T in women universities.

Women who Shaped India's Scientific History

Anandibai Gopalrao Joshi (1865-1887)
- First Indian female to study and graduate with a degree in western medicines from the United States.
- Believed to be the first women to set foot on American soil from India.

Kadambini Ganguly (1861-1923)
- Becomes India's first female doctor & practitioner of western medicine in the whole South Asia.

Bibha Chowdhary (1913-1991)
- First woman high energy physicist of India and the first woman scientist at the TFIR.
- IAU honoured her by naming a white yellow dwarf star after her name.

Edavaleth Kakkat Janaki Ammal (1897-1984)
- Made significant contributions to genetics, evolution, phytogeography and ethnobotany.
- First director of the Central Botanical laboratory at Allahabad.

Debala Mitra (1925-2003)
- First Inidan archaeologist served as Director General of the Archaeological Survey of India.
- Explored and excavated several Buddhist sites.

Kamala Sohonie (1911-1998)
- First Indian woman to receive a PhD in a scientific discipline.
- Discovered the enzyme 'Cytochrome C' (helps in energy synthesis).

Anna Mani (1918-2001)
- First woman to join the Meteorological department.

Kamal Ranadive (1917-2001)
- Established India's first tissue culture research laboratory at the Indian Research Centre in Mumbai.

Sanghamitra Bandyopadhyay
- She has been conferred the Padma Shri in 2022.
- She is the first woman director of the Indian Statistical Institute.

Ms. Sujatha Ramdorai
- She was awarded the Padma shri award in 2023.
- She became the first Indian to win the prestigious ICTP Ramanujan Prize in 2006.
- She was also awarded the Shanti Swarup Bhatnagar Award, the highest honour in scientific fields by the Indian Government in 2004.
- She is also the recipient of the 2020 Krieger-Nelson Prize for her exceptional contributions to mathematics research

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No Age Bar for Health Insurance in India

Why in News?

Recently, the **Insurance Regulatory and Development Authority of India (IRDAI)** has lifted the age ceiling for buying a **medical insurance policy,** a move that widens the insurance net and provides huge relief to senior Indians.

➢ Also, the **Indian Institute of Science (IISc) Bengaluru** has introduced '**Longevity India,'** aimed at studying **aging-related health issues** and creating interventions for better health among the elderly.

What are the IRDAI's Recent Directions Related to Health Insurance?

➢ IRDAI has dissolved the barrier to applying for health insurance in India that allowed only individuals aged 65 and lower to purchase health covers.

  ❍ It has instructed insurers to create specialised products for different demographics such as **senior citizens, students, children, and maternity.**

➢ It has also emphasised that insurers should strive to provide coverage for individuals with all types of pre-existing medical conditions, as outlined in the **"Specific provisions applicable to health insurance products"** published in the Government of India Gazette.

  ❍ Coverage for individuals with pre-existing medical conditions, such as **cancer** or **heart failure**, is now available without refusal.

  ❍ It may increase insurance density and insurance penetration in India.

➢ Insurers are also required to offer premium payment in installments for policyholder convenience, and travel policies can only be provided by general and health insurers.

  ❍ Furthermore, there is no cap on coverage for **AYUSH** **treatments,** including **Ayurveda, Yoga, Naturopathy, Unani, Siddha, and Homeopathy.**

What are the Key Challenges Faced by Elderly Population in India?

➢ **Status of Elderly Population in India:** Recently, India became the world's most populous country surpassing China.

  ❍ More importantly, a **World Health Organisation (WHO)** study has projected that by 2050, the country would be home to over **31 crore people above the age of 60**.

➢ **Challenges:**

  ❍ **Lack of Healthcare Access**: Affordability is a major barrier to proper healthcare for the elderly in India.

    ● Chronic diseases are common, but **limited access to geriatric specialists** and specialists trained in managing age-related health issues worsen their condition.

  ❍ **Elder Abuse and Neglect:** Unfortunately, elder abuse is a growing concern. They are vulnerable to financial exploitation, physical or emotional abuse, and neglect.

    ● At least 5% of India's elderly population (aged 60 years and above) stated they experienced ill-treatment in 2020, according to the **Longitudinal Ageing Study in India (LASI).**

  ❍ **Digital Divide:** Many government programs and services are shifting online, leaving some **tech-unsavvy elderly citizens** struggling to access them.

  ❍ **Financial Insecurity:** A large portion of the elderly population lives below the poverty line, lacking a pension or savings for their healthcare and daily needs.

  ❍ **Social Isolation and Loneliness:** The breakdown of joint families and migration of younger generations to cities lead to social isolation for the elderly.

    ● This lack of social connection contributes to mental health issues like depression and anxiety.

What is IRDAI?

➢ IRDAI is a statutory body formed under the **Insurance Regulatory and Development Authority Act, 1999 (IRDA Act, 1999)** for overall supervision and development of the Insurance sector in India.

  ❍ The powers and functions of the Authority are laid down in the IRDA Act, 1999 and Insurance Act, 1938.

➢ The **Insurance Act, 1938** is the principal Act governing the Insurance sector in India. It provides the powers to IRDAI to frame regulations which lay down the regulatory framework for supervision of the entities operating in the Insurance sector.

Note:

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In India, **insurance penetration (premium as %of GDP)** which was 2.7% in 2001, steadily increased to 4.2% in 2020 and remained the same in 2021.

➢ Also, there has been a sharp increase in **insurance density (premium to population/ per capita)** in India. Whole life insurance density went up from **USD 9.1 in 2001-02 to USD 69 in 2021-22**

Patient Safety Rights Charter

Why in News?

Recently, the **World Health Organization (WHO)** launched a first-ever **Patient Safety Rights Charter** at the **Global Ministerial Summit on Patient Safety**.

➢ It is the **first Charter to outline patients' rights** in the context of safety.

➢ It will help governments and hospitals in **formulating the legislation, policies** and guidelines needed to ensure patient safety.

What are the Key Features of the Patient Safety Rights Charter?

➢ The charter outlines **the core rights of all patients in the context of the safety of health care** and seeks to assist governments and other stakeholders to ensure that the voices of patients are heard and their right to safe health care is protected.

➢ The Charter covers **10 patient safety rights** crucial to **mitigate risks** and prevent unintentional harm, which includes the

  ❍ Timely, effective and appropriate care

  ❍ Safe health care processes and practices

  ❍ Qualified and competent health workers

  ❍ Safe medical products and their safe and rational use

  ❍ Safe and secure health care facilities

  ❍ Dignity, respect, non-discrimination, privacy and confidentiality

  ❍ Information, education and supported decision making Access medical records

  ❍ To be heard and fair resolution

  ❍ Patient and family engagement.

What is Patient Safety?

➢ **About:**

  ❍ **Patient safety** encompasses efforts to prevent unintended harm during healthcare provision, a critical aspect of global healthcare.

➢ **Factors Contributing to Patient Harm:**

  ❍ **Identified Sources of Harm:** Medication errors, surgical errors, healthcare-associated infections, sepsis, diagnostic errors, and patient falls as frequent causes of patient harm.

  ❍ **Varied Factors:** Patient harm arises from **system and organisational failures**, technological limitations, human factors, and patient-related circumstances, illustrating the multi-dimensional nature of patient safety incidents.

What is the Need of Patient Safety Charter?

➢ **Ensuring Safety of Patients:**

  ❍ **Approximately 1 in 10 patients** encounter harm during healthcare procedures, resulting in over 3 million annual deaths attributed to unsafe care, as reported by the **Organisation for Economic Co-operation and Development (OECD).**

  ❍ According to the OECD, **investing in patient safety positively impacts** health outcomes, reduces costs related to patient harm, improves system efficiency, and helps in reassuring communities and restoring their trust in health care systems.

➢ **Preventing Avoidable Harm:**

  ❍ The **majority of patient harm is avoidable**, underscoring the vital role of engaging patients, families, and caregivers in minimising harm.

  ❍ Patient harm often results from **poorly designed healthcare systems**, not isolated incidents.

➢ **Implementation of the Global Patient Safety Action Plan 2021-2030:**

  ❍ A **2023 survey of WHO Member States** revealed gaps in implementing the **Global Patient Safety Action Plan 2021-2030**, emphasising the need for patient representation and addressing income-based disparities in implementation.

  ❍ Interim results of the survey showed **only 13% of responding countries have a patient representative** on the governing board or an equivalent mechanism in the majority of their hospitals.

➢ **Targeting SDG:**

  ❍ Patient safety is a **critical global priority** and essential for achieving the **Sustainable Development Goals (SDG)-3: "Good Health and well-being".**

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UN SPECIALISED AGENCIES

Part III
ILO, WHO and ITU

UNSAs are 15 autonomous international organizations working with the UN

ILO

The only tripartite (govt., trade unions, employers) and the 1st affiliated UNSA

- Estd. - 1919 (Treaty of Versailles)
- Headquarters - Geneva, Switzerland
- Functions -
  » Set labour standards
  » Develop policies & programmes for promoting decent work for all
- Member States - 187 (India a founding member + permanent member of ILO Governing Body)

- International Labour Conference -
  » Meets annually in Geneva
  » aka International Parliament of Labour
- ILO Declaration on Fundamental Principles and Rights at Work 1998 (Principles) -
  » Freedom of Association and The Right to collective bargaining
  » Elimination of forced or compulsory labour
  » Abolition of child labour
  » Elimination of discrimination in respect of employment and occupation

WHO

WHO became functional on April 7, 1948 (now celebrated as World Health Day)

- Estd. - 1948
- Headquarters - Geneva, Switzerland
- Functions -
  » Provides leadership on global health matters
  » Shaping health research agenda
  » Monitoring, assessing health trends
- Member States - 194 (incl. India)

WHO's regional office for SE Asia is located in New Delhi

- World Health Assembly - WHO's decision-making body, held yearly at Geneva
- Major Initiatives -
  » UN Decade of Healthy Ageing (2021–2030)
  » UN Decade of Action on Nutrition (2016-2025)
  » GLASS Initiative (AMR)
  » WHO 1+1 Initiative (2019) (TB)

ITU

- Estd. - 1865
- Headquarters - Geneva, Switzerland
- Functions -
  » Facilitate intl. connectivity in communication networks
  » Allocate global radio spectrum and satellite orbits

- Member States - 193 (India a regular member since 1952)
- Important Publication -
  » Global Cybersecurity Index (GCI)

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Note:

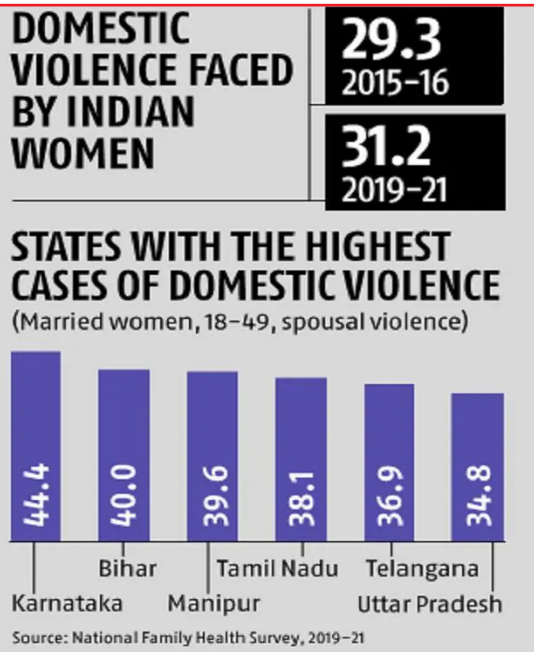drishti

Protection of Women from Domestic Violence

Why in News?

The Delhi High Court recently emphasised the universality of the**Protection of Women from Domestic Violence Act of 2005**, stating that it **applies to all women regardless of their religious or social background.**

➢ The High Court made these observations while dismissing a plea filed by a husband and his relatives.

➢ The plea challenged an appellate court order that reinstated a domestic violence complaint filed by the wife.

How Widespread is Domestic Violence in India?

➢ In India, **32% of ever-married women reported having experienced physical, sexual, or emotional violence** by their husbands in their lifetime.

➢ According to the **National Family Health Survey-5 (NFHS-5), 2019-2021**, "29.3% of married Indian women between the ages of 18 and 49 have experienced domestic/sexual violence; 3.1% of pregnant women aged 18 to 49 have suffered physical violence during their pregnancy."

  ❍ That is only the number of cases reported by women. There are frequently many more that never make it to the police.

➢ According to **NFHS data, 87% of married women who are victims of marital violence do not seek help.**

DOMESTIC VIOLENCE FACED BY INDIAN WOMEN
29.3 2015-16
31.2 2019-21

STATES WITH THE HIGHEST CASES OF DOMESTIC VIOLENCE
(Married women, 18-49, spousal violence)

Karnataka 44.4
Bihar 40.0
Manipur 39.6
Tamil Nadu 38.1
Telangana 36.9
Uttar Pradesh 34.8

Source: National Family Health Survey, 2019-21

What are the Factors Contributing to Domestic Violence?

➢ **Gender Disparities:**

  ❍ India's wide **gender gap,** as reflected in global indices, contributes to a sense of male superiority and entitlement.

  ❍ Men may use violence to assert dominance and reinforce their perceived superiority.

➢ **Substance Abuse:**

  ❍ **Alcohol or drug misuse** that impairs judgement and exacerbates violent tendencies. **Intoxication** leads to loss of inhibitions and escalation of conflicts into physical or verbal abuse.

➢ **Dowry Culture:**

  ❍ There is a strong correlation between **domestic violence and the dowry system,** with instances of violence increasing when dowry expectations are not met.

    ● Despite legislation prohibiting dowry, such as the**Dowry Prohibition Act 1961,** cases of bride burning and violence related to dowry persist.

  ❍ Financial stressors and dependency dynamics that exacerbate tensions within relationships.

➢ **Sociocultural Norms:**

  ❍ Traditional beliefs and practices perpetuate gender roles and household power imbalances.

  ❍ **Patriarchal systems** that prioritise male authority and control over women. Violence often stems from notions of ownership over women's bodies, labour, and reproductive rights, reinforcing a sense of dominance.

    ● Desire for dominance and exertion of control over a partner, stemming from insecurity or entitlement.

  ❍ Social conditioning **often portrays marriage as the ultimate goal for women,** reinforcing traditional gender roles.

  ❍ Indian culture often glorifies women who exhibit tolerance and submission, discouraging them from leaving abusive relationships.

➢ **Socioeconomic Stressors:**

  ❍ **Poverty, and unemployment,** create additional stresses within households, increasing the likelihood of violent behaviour.

➢ **Mental Health Issues:**

  ❍ Untreated mental health conditions such as depression, anxiety, or personality disorders that contribute to volatile behaviour.

Note:

➢ **Lack of Education and Awareness:**
  ○ Limited understanding of healthy relationship dynamics and rights, leading to acceptance or normalisation of abusive behaviour.
    ● Ignorance about legal protections against domestic violence or available support services.
  ○ Many women lack awareness of their rights and accept their subordinate status, perpetuating a cycle of low self-esteem and subjugation.

What Legal Frameworks Address Domestic Violence in India?

Legal Framework	Description
Protection of Women from Domestic Violence Act, 2005 (PWDVA)	➢ Aims to protect women from domestic violence. Covers physical, emotional, sexual, and economic abuse. Provides various orders for protection, residence, and relief.
Indian Penal Code, 1860 (Section 498A)	➢ Deals with cruelty by a husband or his relatives towards a woman. Criminalises acts of cruelty, harassment, or torture.
Indian Evidence Act, 1872	➢ While not exclusively focused on domestic violence, this act provides rules for evidence in legal proceedings. Relevant in cases related to domestic violence.
Dowry Prohibition Act, 1961	➢ Addresses dowry-related offences. Makes giving or receiving dowry a crime.
Criminal Law (Amendment) Act, 2013 (Section 354A)	➢ Amended the IPC to include new offenses related to **sexual harassment. Relevant in cases of domestic violence.**
Juvenile Justice (Care and Protection of Children) Act, 2015	➢ Protects children's rights and welfare. Relevant when children are victims of domestic violence.
National Commission for Women Act, 1990	➢ Establishes the National Commission for Women (NCW) to **safeguard women's rights**. NCW plays a role in addressing domestic violence.
The Prohibition of Child Marriage Act, 2006	➢ **Aims to prevent child marriages.** Relevant when child brides face domestic violence.
Domestic abuse in the context of same-sex relationships	➢ Current laws primarily focus on heterosexual relationships, **leaving same-sex partners vulnerable to domestic abuse without legal recourse.** ➢ Recognition of same-sex marriages could impact existing laws, potentially extending protections to same-sex couples and addressing domestic abuse within these relationships.

Global Initiatives
➢ Convention on the Elimination of All Forms of Discrimination against Women (CEDAW):   ○ Adopted in 1979 by the **UN General Assembly,** CEDAW works towards eliminating discrimination against women in all areas of life.   ➢ UN Declaration on the Elimination of Violence against Women (DEVAW):   ○ The 1993 DEVAW was the **first international instrument explicitly addressing violence against women**, providing a framework for national and international action.   ➢ Safe Cities and Safe Public Spaces: ○ This initiative is a flagship program by **UN Women** aimed at preventing and responding to sexual harassment and other forms of violence against women and girls (W&G) in public spaces.   ○ It works collaboratively with city governments, local communities, and civil society organisations.   ➢ **Beijing Platform for Action:**   ○ The 1995 Beijing Platform for Action identifies specific actions for governments to take to **prevent and respond to violence against women and girls**.

Note:

Why is Enforcement of Laws Against Domestic Violence Challenging?

- ➢ **Social**:
  - ○ Victims often hesitate to **report domestic violence due to societal stigma**, fear of retaliation, or concerns about family reputation. This silence makes it challenging for authorities to take action.
  - ○ Domestic violence incidents are often underreported. Victims may not recognise certain behaviours as abuse or may normalise them.
- ➢ **Lack of Awareness:**
  - ○ Many people, including victims, are **unaware of their legal rights and available resources.** Without awareness, reporting and seeking legal help become difficult.
- ➢ **Dependency and Economic Factors:**
  - ○ Victims may be financially dependent on their abusers. **Fear of economic repercussions** can prevent them from seeking legal assistance.

- ➢ **Inadequate Implementation and Training:**
  - ○ Law enforcement agencies and judicial bodies may lack proper training on handling domestic violence cases. Inconsistent implementation of laws hinders effective enforcement.
- ➢ **Legal Hurdle:**
  - ○ Proving domestic violence in court requires substantial evidence. Lack of witnesses or physical evidence can weaken cases.
- ➢ **Complex Family Dynamics:**
  - ○ Domestic violence often occurs within family units. Legal actions can disrupt **family relationships, making victims hesitant to pursue legal remedies.**
- ➢ **Cultural and Regional Variations:**
  - ○ Different cultural norms and practices affect how domestic violence is perceived and addressed.
  - ○ Enforcement strategies must consider these variations.

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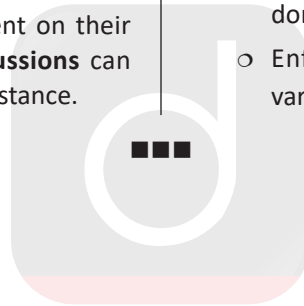
Note:

Science & Technology

Highlights

- Earth's Ancient Magnetic Field
- Virtual Private Network
- DURGA II Laser Weapon
- Inflammatory Bowel Disease (IBD)
- Mpox Virus
- Satellite Technology Day 2024
- Israel's GPS Spoofing Against Iran
- Hydrocarbons Exploration and Extraction
- Tiantong Project
- Parkinson's Disease
- PRATUSH Telescope
- Surya Tilak Project Ram Lalla
- Prostate Cancer
- POEM-3 Mission and Space Debris

Earth's Ancient Magnetic Field

Why in News?

Recently, a study in the *Journal of Geophysical Research* by geologists at the Massachusetts Institute of Technology and Oxford University unveiled insights into **Earth's ancient magnetic field,** as revealed by ancient rocks, shedding light on its early geological evolution.

### What are the Key Findings of the Study?

➢ **Strength of Magnetic Field:**
- ○ Geologists discovered ancient rocks in the Isua Supracrustal Belt in southwestern Greenland dating back approximately **3.7 billion years,** bearing the oldest remnants of Earth's early magnetic field.
  - ● The rocks retain signatures of a magnetic field with a strength of at **least 15 microtesla**, similar in magnitude to Earth's magnetic field today (around 30 microtesla).

➢ **Magnetic Field's Lifetime:**
- ○ Previous studies suggested a magnetic field on **Earth at least 3.5 billion years old,** but this study extends its lifetime by another 200 million years.
- ○ Using **uranium-to-lead ratio analysis**, researchers estimated that some of the magnetised minerals in the rocks were approximately 3.7 billion years old.

➢ **Potential Role in Earth's Habitability:**
- ○ The early magnetic field may have played a critical role in making the planet habitable.
  - ● It likely helped retain a **life-sustaining atmosphere** and shielded the planet from damaging solar radiation.

Evolution of Earth's Magnetic Field

Modern
(0-650 Million yr ago)

Ancient
(650-1000 Million yr ago)
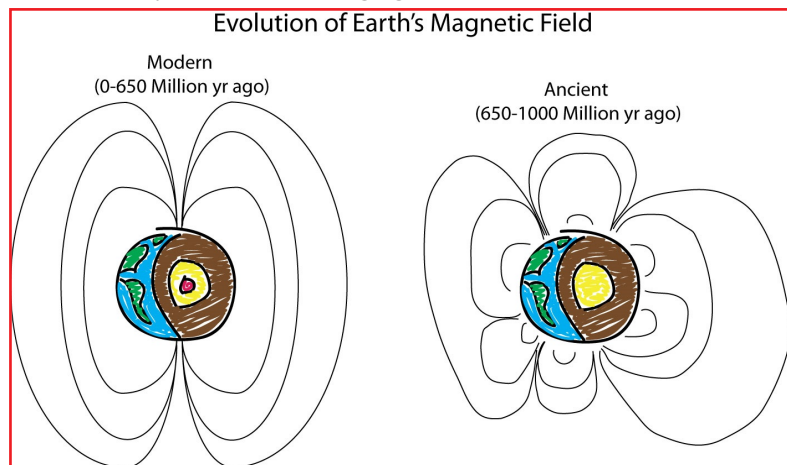
Uranium-to-Lead Ratio Analysis

➢ Uranium-lead dating, or U-Pb dating, is a **radiometric dating technique** that uses the ratio of **uranium isotopes** to lead isotopes to determine the age of earth materials.
➢ The ratio of uranium to lead is used to determine the rate at which uranium decays into lead, which is then used to determine the age of a rock.

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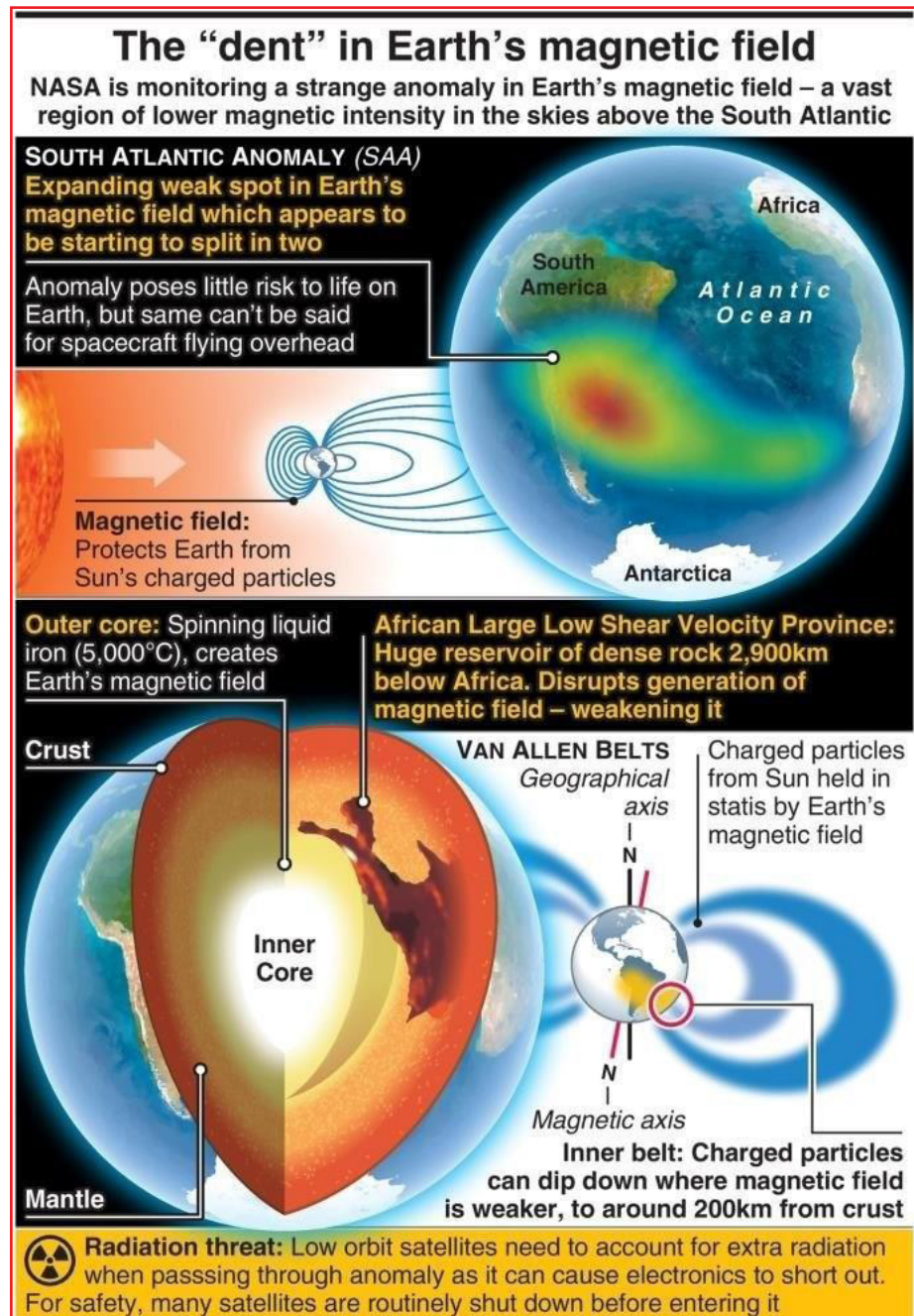
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What is Earth's Magnetic Field?

➢ **About:**

○ Earth's magnetic field, also known as the **geomagnetic field,** is generated in the planet's interior and extends into space, creating a region called the **magnetosphere** and interacting with the solar wind.

○ The magnetic field is generated by convection currents of molten iron and nickel in the **Earth's core,** which carry charged particles and generate magnetic fields.

○ Not only Earth, but **Jupiter, Saturn, Uranus, and Neptune** also have strong magnetic fields, which are not fully understood.

● Mars lacks the inner heat and liquid interior needed for a magnetic field, while Venus has a liquid core but spins too slowly to generate one.

➢ **Geodynamo Process:**

○ Earth's magnetic field is generated by the **geodynamo process** in the outer core.

● The convective energy from the **slow-moving molten iron in the outer core** is converted to electrical and magnetic energy, inducing a positive feedback loop.

➢ **Magnetic poles:**

○ Earth has two sets of poles: the geographic poles and the magnetic poles.

● The **geographic North and South poles** are the locations where the **lines of longitude converge,** with the Geographic North Pole situated in the middle of the Arctic Ocean and the Geographic South Pole located in Antarctica.

○ In contrast, the **magnetic poles are the locations where the magnetic field lines enter and exit the Earth's surface.**

The "dent" in Earth's magnetic field

NASA is monitoring a strange anomaly in Earth's magnetic field – a vast region of lower magnetic intensity in the skies above the South Atlantic

SOUTH ATLANTIC ANOMALY *(SAA)*
Expanding weak spot in Earth's magnetic field which appears to be starting to split in two

Anomaly poses little risk to life on Earth, but same can't be said for spacecraft flying overhead

Magnetic field: Protects Earth from Sun's charged particles

Outer core: Spinning liquid iron (5,000°C), creates Earth's magnetic field

African Large Low Shear Velocity Province: Huge reservoir of dense rock 2,900km below Africa. Disrupts generation of magnetic field – weakening it

Crust

VAN ALLEN BELTS *Geographical axis* Charged particles from Sun held in statis by Earth's magnetic field

Inner Core

Mantle

Magnetic axis

Inner belt: Charged particles can dip down where magnetic field is weaker, to around 200km from crust

Radiation threat: Low orbit satellites need to account for extra radiation when passsing through anomaly as it can cause electronics to short out. For safety, many satellites are routinely shut down before entering it

Note:

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- The Magnetic North Pole, also known as the **North Dip Pole,** is currently found on **Ellesmere Island in northern Canada.**
- When a compass points north, it is **aligning itself with the Earth's magnetic field and pointing towards the Magnetic North Pole**, not the true Geographic North Pole.

➢ **Protection from Space Weather:**
  ○ Earth's magnetosphere shields the planet from harmful space weather, such as **solar wind, coronal mass ejections (CMEs),** and **cosmic rays.**
  ○ The magnetosphere repels harmful energy away from Earth and traps it in zones called the **Van Allen radiation belts.**

➢ **Geomagnetic Storms and Auroras:**
  ○ During strong space weather events, Earth's magnetic field can be disturbed, leading to geomagnetic storms that can cause power blackouts and communication disruptions.
  ○ Disturbances in Earth's magnetic field also funnel ions towards the polar regions, creating spectacular **auroras** (**northern lights and southern lights**).

Virtual Private Network

Why in News?

Russia's tightening grip on **online content** in recent years has led to a significant surge in **Virtual Private Network (VPN) usage** among citizens seeking unrestricted access to information and media platforms.

What is a VPN?

➢ **About:** A **VPN** is a technology that establishes a **secure and private connection between a user's device and the internet**. VPNs encrypt the internet traffic and disguise the user's online identity.
  ○ VPNs can **bypass geo-restrictions** and censorship. By connecting to a VPN server in a different location, users can access content and websites that may be restricted or blocked in their region.

➢ **Mechanism:**
  ○ **Encryption:** When a user connects to a VPN, all data transmitted and received is encrypted.

- Encryption **converts data into a code** that only the user's device and the VPN server can decipher using a decryption key.
○ **Secure Tunneling**: Encrypted data travels through a **secure tunnel to the VPN server.**
  - This tunnel prevents unauthorised parties like **Internet Service Providers (ISP)**, hackers or government agencies from intercepting or monitoring the user's online activities.
○ **IP Address Masking**: The user's real IP address, which can reveal their location and device information, is **replaced with the IP address of the VPN server.**
  - This masking process enhances user privacy and makes it difficult for websites to track the user's actual location.

What are Other Key Technologies Similar to VPN?

➢ **Smart Domain Name System (DNS):** It provides a proxy server resource for additional protection of a user's identity by masking a **user's ISP-generated DNS address** with a different address, generated by the Smart DNS device, before sending the user request to the internet.

➢ **The Onion Router:** It protects user data by encapsulating the data in **multiple layers of secure encryption,** using the **Onion Protocol,** as it routes the data from sender to receiver.
  ○ The process ensures that a user's identity is protected from ISPs and advertisers.

➢ **Proxy Servers**: Proxy servers act as intermediaries between a user's device and the internet.
  ○ They can be used to hide the user's IP address, bypass content filters, and improve speed by caching frequently accessed web pages.

Note:

➢ In 2022, the **Indian Ministry of Electronics and Information Technology** introduced regulations mandating VPN providers, data centres, virtual service networks, and cloud providers to record users' personal details for five years.

➢ They must also log usage patterns, and service purposes, and report cybersecurity incidents to **CERT-In** within six hours.

WHAT IS A VPN?

1

- VPN describes the opportunity to establish a protected network connection when using public networks.
- VPNs encrypt internet traffic and disguise the user's online identity. This makes it more difficult for third parties to track activities online and steal data. The encryption takes place in real time.
- Currently, a handful of governments either regulate or outright ban VPNs. These include China, Belarus, Iraq, North Korea, Oman, Russia, and the UAE.

VPN ADVANTAGES

2

- **Safety:** A VPN would prevent everyone from the government to cybercriminals from tracking one back easily.
- **Location Spoofing:** Services and websites often contain content that can only be accessed from certain parts of the world. With VPN location spoofing, one can switch a server to another country and effectively change location.

VPN DISADVANTAGES

3

- **Reduced Internet Speed:** Since VPNs require your traffic to be routed via a VPN server, it could take longer to reach your destination website.
- **Not Anti-Virus Software:** While VPNs protect one's IP and encrypt one's internet history, a VPN connection does not protect one's computer from outside intrusion.

Virtual Private Networks (VPN)

WHAT ARE THE NEW RULES RELATED TO VPN?

4

- CERT-In has passed a rule mandating VPN provider to record and keep their customers' logs for 180 days. It also asked these firms to collect and store customer personal data for up to five years.
- It further mandated that any cybercrime recorded must be reported to the CERT within 6 hours of the crime.

WHAT ARE THE ISSUES WITH THE NEW RULES?

5

- The government said it wants these details to fight cybercrime, but the industry argues that privacy is the main selling point of VPN services, and such a move would be in breach of the privacy cover provided by VPN platforms.

DURGA II Laser Weapon

Why in News?

Recently, the **Defence Research and Development Organisation (DRDO)** has sought USD 100 million from the Ministry of Defence to develop a high-power laser weapon, named **Directionally Unrestricted Ray-Gun Array (DURGA) II,** a lightweight directed energy weapon (DEW).

➢ It is a 100-kilowatt lightweight DEW and **can be used by armed forces.**

➢ It aims to provide the Indian armed forces with **cutting-edge technology capable of neutralising various threats, including drones, missiles, and artillery shells**.

Note:

What are Directed-Energy Weapons (DEWs)?

➢ **About:**

○ It is a type of weapon system that **emits highly focused energy,** typically in the form of **lasers, microwaves, or particle beams,** to incapacitate or destroy targets.

○ Unlike traditional firearms or explosives which rely on **kinetic energy (physical impact),** **DEWs use directed energy** to achieve their effects.

➢ **Types:**

○ **Laser Weapons:** It uses a **concentrated beam of coherent light** to heat and damage the target.

● They can be used for various purposes, including **target destruction, missile defence,** and disabling electronics.

○ **Microwave Weapons:** They emit **electromagnetic radiation** in the microwave frequency range to disrupt or damage electronic systems, such as **computers, sensors, or communication devices.**

○ **Particle Beam Weapons:** They accelerate **charged or neutral particles** to high velocities and direct them towards the target to cause damage through **kinetic energy transfer or ionisation effects.**

➢ **Advantages:**

○ It has advantages including **precision targeting, rapid engagement,** reduced collateral damage, and potentially lower costs per shot.

● DEWs are believed to be the sole **answer to virtually 'unstoppable' hypersonic** missiles.

○ They have **applications in military defence, homeland security,** space exploration, and law enforcement.

○ It transmits **lethal force at the speed of light.**

○ These weapons are **not affected by the constraining effects of gravity** or atmospheric drag, making them **extremely precise.**

➢ **Challenges:**

○ **Limited Range:** Most DEWs have limited range, and their effectiveness **decreases with increasing distance** between the target and the weapon.

○ **High Cost:** It **can be expensive** to develop and manufacture, and the cost may not be justified by their effectiveness in some situations.

○ **Countermeasures**: It can be countered by using **reflective materials** which can reduce their effectiveness.

● Its effectiveness can be influenced by factors such as **atmospheric conditions, including fog, rain, and dust.**

➢ **Arms Race:** The development of DEWs may lead to an arms race among nations.

● Examples such as **the current nuclear race among nations.**

➢ **Significance for India:**

○ The application of this technology in the **defence industry** can transform the way wars will be fought enabling India to produce **cutting-edge platforms, weapons, sensors, and networks essential to fight and win a future war.**

○ DEWs could act as a **deterrent against hostile nations** such as China, and Pakistan by increasing India's defence capabilities.

○ **Other Countries with DEWs:**

● **Russia, France, Germany, the United Kingdom, Israel, and China** are reportedly among the countries that have programmed to develop DEWs or Laser Directed Energy Weapons.

● Earlier, theUS also accused Cuba of carrying out sonic attacks **(Havana Syndrome).**

Note:

➢ The **global DEW market** was worth USD 4.1 billion in 2020 and is forecasted **to reach USD 15.5 billion by 2027**, with a CAGR of 19.63%.

Note:
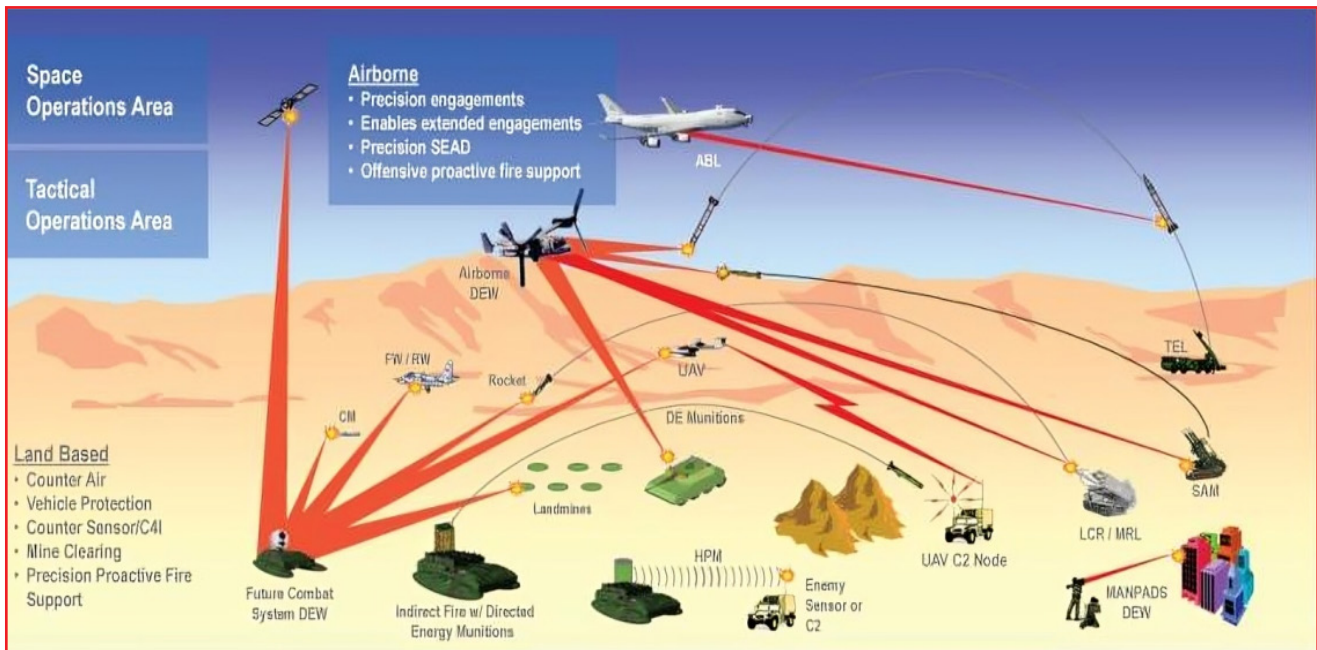
Inflammatory Bowel Disease (IBD)

Why in News?

Recently, **Inflammatory Bowel Disease (IBD)** comprising primarily **Ulcerative Colitis** and **Crohn's Disease** has been on the rise globally.

What is Inflammatory Bowel Disease (IBD)?

➢ **About:** IBD is an **umbrella term** for <u>**chronic inflammatory**</u> conditions affecting the **gastrointestinal (GI) tract.**

  ❍ Two main forms of IBD:

    ● **Crohn's disease:** Itcan **affect any part** of the **digestive tract**, from mouth to anus. Inflammation can be patchy, meaning areas of healthy tissue can be interspersed with inflamed areas. It often **affects** the **deeper layers** of the bowel wall.

    ● **Ulcerative colitis:** Limited to the **inner lining (mucosa)** of the large intestine (colon) and rectum. The inflammation is continuous, affecting the entire colon in severe cases.

➢ **Causes:** The exact cause of IBD remains unknown, but research suggests a **complex interplay of factors like genetics, immune system** and **environmental factors.**

➢ **Symptoms:** Abdominal pain and cramping, diarrhea, often bloody, urgent need to have a bowel movement, weight loss and fatigue.

➢ **Treatment:** There is **no cure for IBD,** but treatments aim to **manage symptoms** and induce remission. These include **medications, dietary modifications** and **surgeries**.

➢ **Challenges in India:**

  ❍ The incidence of IBD has almost **doubled in India** from 1990 to 2019, underscoring an urgent need for early detection to facilitate better treatment outcomes.

Note:

○ Diagnosing IBD in India presents unique challenges, especially in distinguishing between Crohn's Disease and intestinal **tuberculosisdue to similar clinical symptoms.**

○ Lifestyle changes, including a shift towards a **Westernized diet**, are cited as **contributing factors** to the rising incidence of IBD in India.

> **Note:** IBD is a **chronic inflammatory disease** of the digestive tract influenced by genetic, immune, and environmental factors, whereas Irritable Bowel Syndrome (IBS) is a **non-inflammatory functional bowel disorder** possibly linked to altered gut-brain interactions, heightened gut nerve sensitivity, or digestive muscle contraction issues.
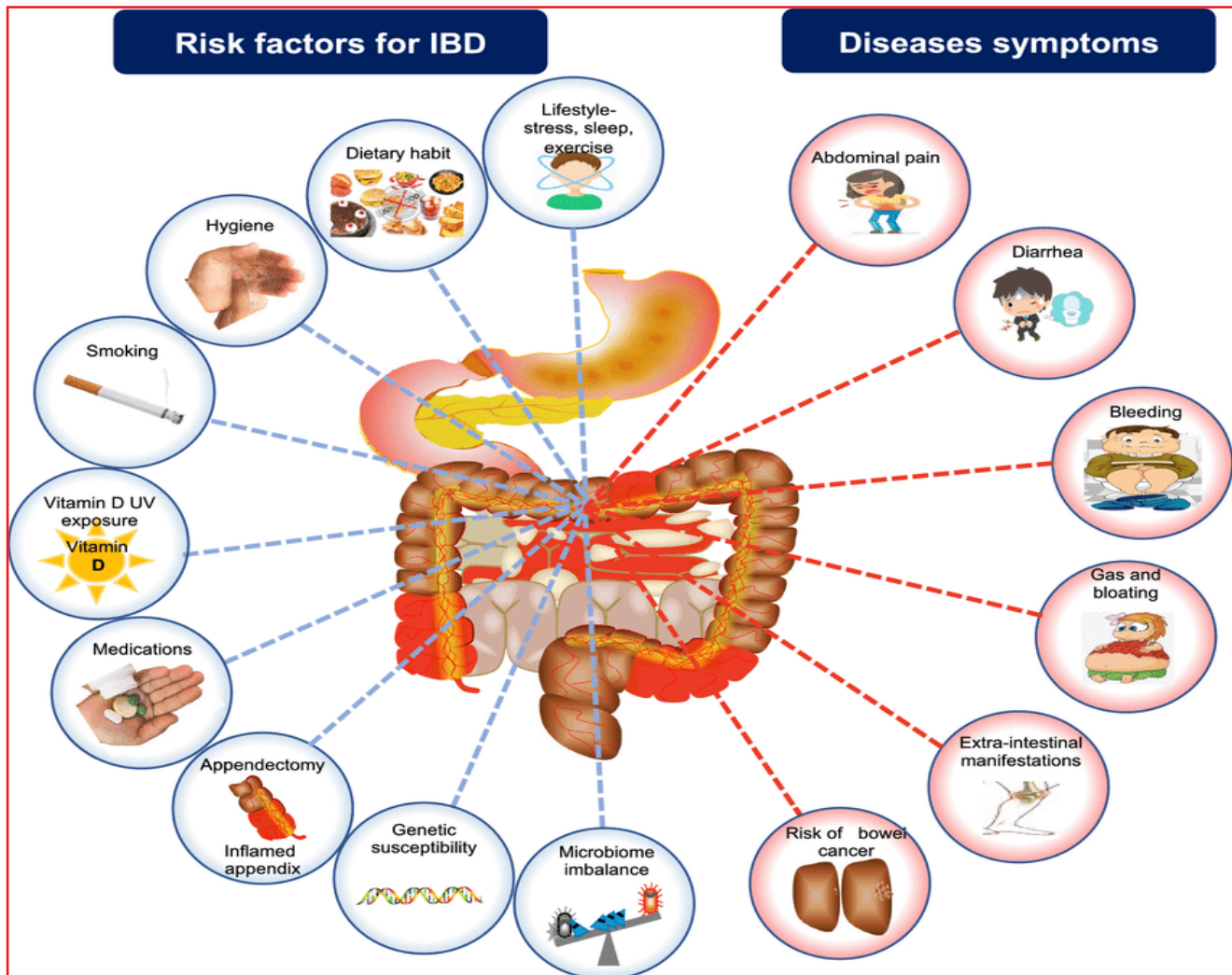
Mpox Virus

Why in News?

Recently, a study revealed a novel **adaptation mechanism** of the **Mpox virus** enhancing its ability to infect humans amidst recent outbreaks.

➢ The name was changed from**"monkeypox" to "mpox"** to avoid stigma towards monkeys and reflect the virus's direct human infectivity.

Note:

What is Mpox?

➢ **About:**
  ○ Mpox, also known as monkeypox, is a **DNA virus.** It belongs to the *family Poxviridae,* which consists of large, **double-stranded DNA** viruses.
    ● The virus was first identified in monkeys in 1958 but has since been found to **infect humans as well.**
  ○ **Transmission:** Mpox is primarily transmitted to humans **from animals**, particularly **rodents and primates**, through direct contact or through contaminated objects.
  ○ **Symptoms:** Mpox infection in humans typically presents with **fever, headache, muscle aches**, and a characteristic rash that progresses from macules to papules to vesicles and pustules.
  ○ **Vaccination:** While a vaccine for mpox exists, its **availability and effectiveness** are **limited**, highlighting the need for improved prevention and control measures.
➢ **Global Outbreaks:** Mpox gained global attention during a widespread outbreak that affected over 100,000 people in more than 118 countries in 2022-2023.
  ○ The outbreak was characterised by high **human-to-human transmission,** particularly through **close contact and the sexual route.**
➢ **WHO Declaration:** The **World Health Organization (WHO)** declared the mpox outbreak a **public health emergency**, leading to coordinated efforts to control its spread.

➢ **Genomic Features:**
  ○ **Clades and Lineages:** Mpox genomes are divided into **clades I and II,** with evidence suggesting **clade I has higher mortality**.
    ● The **2022 outbreak** involved a new lineage, **clade IIb**, better adapted for human-to-human transmission.
  ○ **Genomic Analysis:** Researchers found evidence of a **distinct lineage of clade I associated with human-to-human transmission,** suggesting a recent **zoonotic spillover event.**
  ○ **Evolutionary Adaptations:** Mpox viruses can undergo **genomic accordion** through gene duplication or deletion to adapt to different hosts and environments.
    ● A study published in Nature Communications sequenced the genome of the mpox virus from the 2022 outbreak, revealing that certain sections **strongly influence** human-to-human transmission and are the virus's genomic accordions.

Note:
➢ **Genomic accordion** refers to the **rhythmic expansions** and **contractions** in the size of a **virus's genome**, specifically observed in poxviruses like mpox.
  ○ This phenomenon is driven by the **duplication or deletion** of genes within the virus's genome, leading to changes in its size and content.

| Difference Between Small Pox, Chicken Pox, Mpox			
Feature	**Smallpox**	**Monkeypox**	**Chickenpox**
Virus	*Variola virus*	*Monkeypox virus*	*Varicella-zoster virus (VZV)*
Severity	Highly severe, often fatal	Milder than smallpox, rarely fatal	Mild
Status	Eradicated in 1980	Endemic in Central and West Africa, cases emerging elsewhere	Common childhood illness, less common due to vaccination
Transmission	Highly contagious through respiratory droplets and contact with infected lesions	Spread through contact with infected animals, lesions, or bodily fluids	Highly contagious through respiratory droplets and contact with lesions
Symptoms	Fever, headache, severe fatigue, vomiting, followed by a deep-seated, pus-filled rash	Fever, headache, swollen lymph nodes, followed by a rash that progresses through stages	Fever, fatigue, loss of appetite, followed by an itchy, fluid-filled rash
Vaccination	No longer needed	Not routinely recommended, may be given to high-risk individuals	Routine vaccination for children and adults who haven't had chickenpox

Note:

Satellite Technology Day 2024

Why in News?

U R Rao Satellite Centre (formerly known as ISRO Satellite Centre (ISAC)), Department of Space, in Bengaluru recently celebrated **Satellite Technology Day (STD) 2024,** marking the significant milestone of the **50th anniversary of India's first satellite launch, Aryabhata,** on **19th April 1975.**

➢ The event highlighted URSC's achievements along with recent missions like **Chandrayaan-3**, **Aditya-L1,** and **X-ray Polarimeter Satellite** which garnered national and international recognition.

What are the Key Facts About Aryabhata Satellite?

➢ The Aryabhata spacecraft, named after the 5th Century CE mathematician and astronomer, was India's first satellite. It was completely designed and fabricated in India and launched from Kapustin Yar, Russia on **19th April 1975.**

  ❍ On that day, India became only the world's 11th nation to send a satellite into orbit.

➢ Aryabhata was built by the **Indian Space Research Organization (ISRO)** to conduct experiments in X-ray astronomy, aeronomics, and solar physics.

Aryabhata Satellite	
Payload	X-ray Astronomy Aeronomy and Solar Physics
Launch site	Volgograd Launch Station (presently in Russia)
Launch vehicle	C-1 Intercosmos

Aryabhata Satellite (1975)
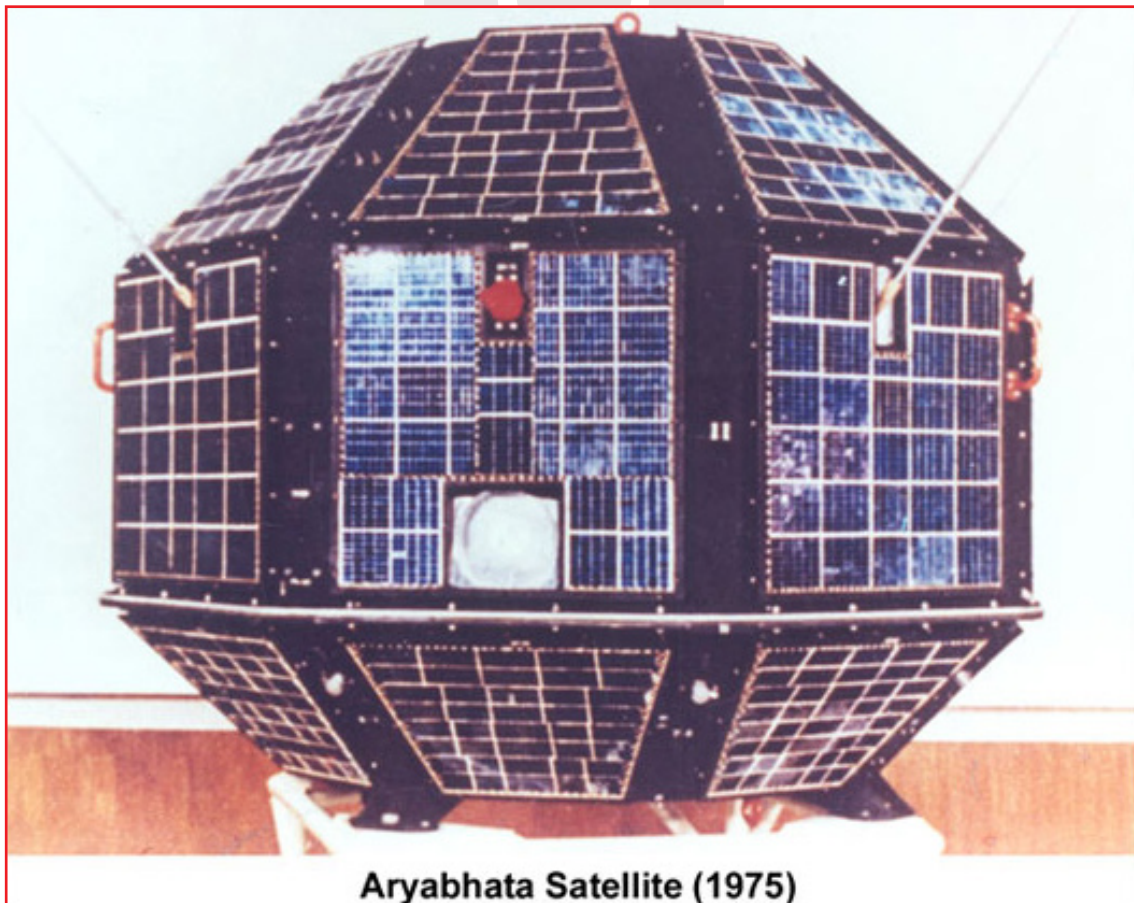
Note:

U R Rao Satellite Centre

➢ U R Rao Satellite Centre named after the former ISRO Chairman **Dr. Udupi Ramachandra Rao**, it is the lead centre of the ISRO responsible for design, development, checkout & integration of communication, navigation, remote sensing, scientific and small satellite missions.

➢ URSC is actively involved in creating cost-effective space infrastructure for India.

➢ The centre is responsible for the total Spacecraft project management from the Conceptualisation phase to In-orbit spacecraft operationalisation phase.

ISRO LAUNCH VEHICLES

BACKGROUND

◈ First rocket developed by ISRO - SLV (Satellite Launch Vehicle)

◈ Successor of SLV - Augmented Satellite Launch Vehicle (ASLV)

Polar Satellite Launch Vehicle (PSLV)

◈ About
- The Workhorse of ISRO
- 3rd gen, 4-Staged launch vehicle (1st, 3rd stages - solid fuel; 2nd, 4th stages - liquid fuel)

◈ Capacity
- Delivers earth-observation/remote-sensing satellites
- Used to launch satellites of lower mass (~1400 Kg)

◈ **4** Variants:
- PSLV-CA
- PSLV-QL
- PSLV-DL
- PSLV-XL

◈ Launches Satellites in
- Low inclination LEO
- Sub-GTO
- GTO

◈ Important Launches:
- First successful launch - October 1994
- Chandrayaan-1 (2008)
- Mars Orbiter Spacecraft (2013)

PSLV is 1st Indian launch vehicle to be equipped with liquid stages

Launch Vehicle Mark-III

◈ About
- Aka GSLV Mk-III
- 3-stage launch vehicle (2 solid propellant and 1 core stage comprising liquid and cryogenic stages)

◈ Capacity
- 4,000-kg of satellites into GTO
- 8,000 kg of payloads into LEO

◈ Launches Satellites in
- GTO
- Medium Earth orbit (MEO)
- LEO
- Missions to moon, sun

Mk-III versions have made ISRO entirely self-sufficient in launching its satellites

Geosynchronous Satellite Launch Vehicle (GSLV)

◈ About
- 4th Gen, 3-staged launched vehicle
- Much more powerful rocket, carries satellites much deeper into space
- Has an indigenous Cryogenic Upper Stage

◈ Capacity
- Delivers communication-satellites
- Carries heavier satellites (~2200 kg to GTO)
- Carries 10,000-kg satellites to LEO

◈ Launches Satellites in
- Primarily Geosynchronous Transfer Orbit (GTO) (~36000 Km altitude)

◈ Important Launches:
- Chandrayaan-2
- Upcoming Gaganyaan

Small Satellite Launch Vehicle (SSLV)

◈ About
- Developed specifically for small and micro-satellites

◈ Capacity
- Satellites up to 500 kg

◈ Launch Limit
- 500 km planar orbit (LEO) from Satish Dhawan Space Centre

Drishti IAS

Note:

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Israel's GPS Spoofing Against Iran

Why in News?

Recent reports suggest that Israel employed **Global Positioning System (GPS)spoofing** techniques to protect against Iranian missile attacks, reminiscent of past instances like **United States (US)** actions during the **Kargil war** in India.

NAVIGATION WITH INDIAN CONSTELLATION (NavIC)

Navigation with Indian Constellation, also known as NavIC, is a stand-alone satellite navigation system, which is similar to GPS.

DEVELOPED BY
- Indian Space Research Organisation **(ISRO)**

NUMBER AND POSITIONING OF SATELLITES
- 8 (only 7 active): 3 in geostationary and 4 in geosynchronous orbits

PREVIOUSLY KNOWN AS
- Indian Regional Navigation Satellite System **(IRNSS)**

NavIC is recognised by IMO as a part of World-Wide Radio Navigation System (WWRNS) for operation in the Indian Ocean Region.

APPLICATIONS
- **Navigation -** Terrestrial, aerial and marine
- **Tracking and Mapping -** Vehicle and fleet management
- **Location Based -** Precise timing for ATMs and power grids
- **Resource Monitoring -** Surveying and geodesy, scientific research
- Safety-of-life **alert dissemination**
- **Time dissemination** and synchronization
- **Integration with mobile phones**

SIGNIFICANCE
- **Real time information** for civilian as well as strategic users
- **India's reduced dependence** on other countries
- Scientific & technological **advancement**
- Regional integration and India's diplomatic goodwill gesture

ISSUES
- Constellation satellites **exceeding their operational lifespan**
- Mobile phones **lacking compatibility** with NavIC
- **Limited coverage** of NavIC (extends only 1,500 km beyond India)

OTHER NAVIGATION SYSTEMS

Global Systems
- **GPS** (US), **GLONASS** (Russia), **Galileo** (European Union)and **BeiDou** (China)

Regional Systems
- **Quasi-Zenith Satellite System** (QZSS) from Japan

Geosynchronous Orbit

Geostationary Orbit

Drishti IAS

Note:

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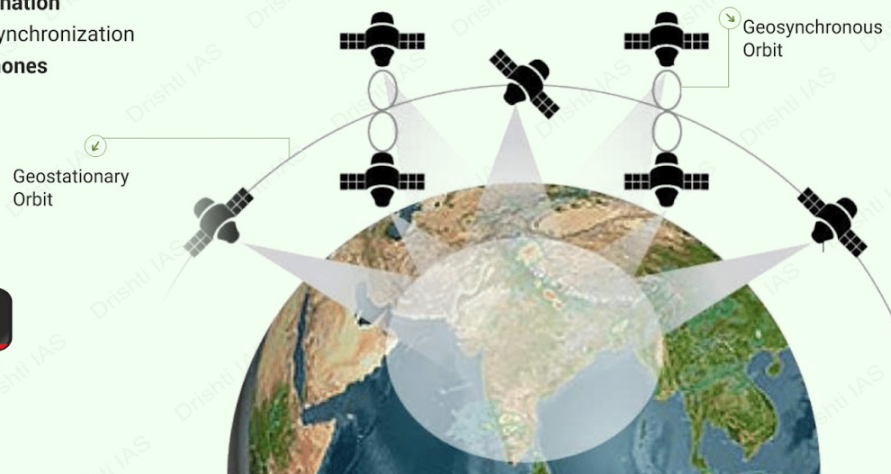
What is GPS Spoofing?

➢ **About:**
  ○ GPS spoofing is a technique used to **manipulate the GPS signals** to deceive receivers, making them believe they are at a different location than they are.
  ○ This can involve broadcasting false GPS signals or altering genuine ones to mislead navigation systems, leading to inaccurate positioning information.
  ○ Spoofing can be used for various purposes, including deceiving enemy navigation systems, protecting against unauthorised tracking, or creating false location data for malicious intents.

➢ **Implications:**
  ○ **Military Disruption:** Misleading enemy navigation systems, leading to inaccurate targeting.
  ○ **Navigation Safety Risks:** Potential accidents or collisions in maritime and aviation sectors.
  ○ **Critical Infrastructure Disruption:** Disruption of essential services like power grids or transportation systems.
  ○ **Financial Fraud:** Manipulation of location-based services for fraudulent transactions.
  ○ **National Security Threats:** Deception of military or government agencies, espionage, and infiltration risks.

Did the US Engage in GPS Spoofing During the Kargil War?

➢ According to the reports, about 25 years ago, Pakistani soldiers crossed into India and took positions in Kargil in 1999. The Indian military requested GPS data for the region but was denied by the US.

➢ The US initially employed a technology called **"selective availability"** to intentionally introduce errors into civilian GPS receivers, reserving the best accuracy for military use.
  ○ This technology was used to "degrade" GPS accuracy for the Indian military during the Kargil war, hindering their operations.

➢ **India's Response:**
  ○ India developed **NavIC (Navigation with Indian Constellation),** which was erstwhile known as the **Indian Regional Navigation Satellite System (IRNSS)** developed by the **Indian Space Research Organisation (ISRO).**
  ○ NavIC provides precise and secure positioning, navigation, and timing services anywhere in India and 1500 kilometres beyond India's territorial boundary.

  ○ **NavIC offers two services:**
    ● **Standard Position Service (SPS)** for civilian users and **Restricted Service (RS) for strategic users.**
    ● NavIC SPS signals are interoperable with the other **global navigation satellite system (GNSS)** signals namely GPS, **Glonass (Russia),Galileo (European Union)** and **BeiDou (China).**

Hydrocarbons Exploration and Extraction

Why in News?

The two Industrial Revolutions were triggered by humanity's discovery of how to extract hydrocarbons. These hydrocarbons powered large engines, leading to contamination of the air, water, and atmosphere, and ultimately contributing to global warming.
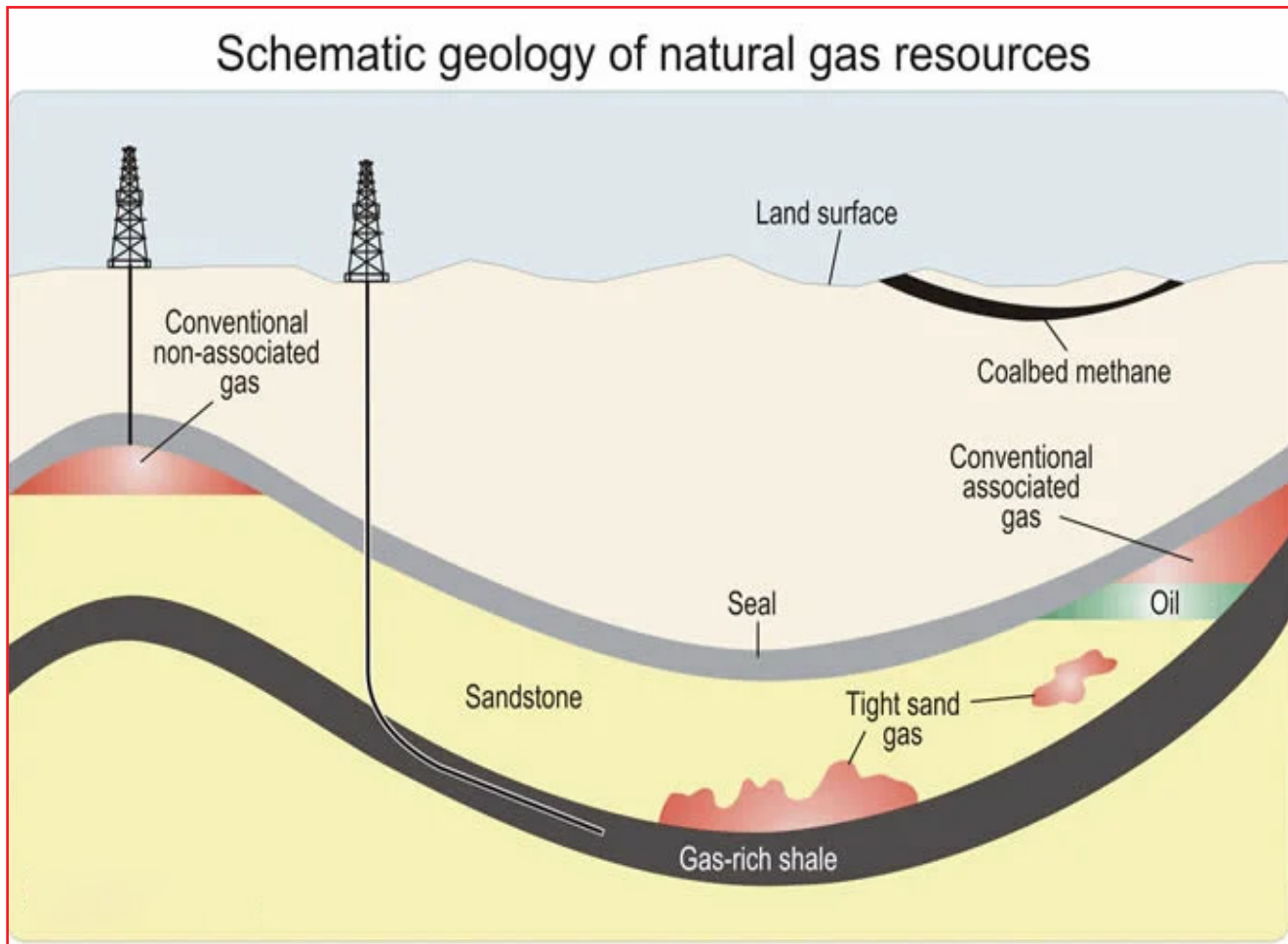
➢ In light of escalating global warming, it's crucial for the world to consider less harmful ways of utilising hydrocarbons.

What are Hydrocarbons and their Storage?

➢ **About:**
  ○ **Hydrocarbons** are organic compounds made up of **Hydrogen and Carbon**. While the carbon atoms create the compound's framework, the hydrogen atoms attach to them in a variety of different configurations.
  ○ **Hydrocarbon Exploration** is the search for deposits of hydrocarbons, such as petroleum and natural gas, in the Earth's crust. It's also known as oil and gas exploration.
  ○ **Kerogens** are the **lumps of organic matter** and they are the **primary source of hydrocarbons** in the rocky underground.
  ○ Kerogen can be deposited from three possible sources as the remains of a lake (**lacustrine**), a **larger marine ecosystem**, or a **terrestrial ecosystem**.
  ○ Rocks surrounding the kerogen can become warmer, more compactified over time, exerting forces on the kerogen that cause it to break down.
  ○ **Lacustrine kerogen yields waxy oils**; marine kerogen, **oil and gas**; and terrestrial kerogen, **light oils, gas, and coal.**

Note:

Schematic geology of natural gas resources

Figure labels: Conventional non-associated gas, Land surface, Coalbed methane, Conventional associated gas, Seal, Oil, Sandstone, Tight sand gas, Gas-rich shale

- ➤ **Types: Based on their structure and bonding, Hydrocarbons can be classified as:**
  - ○ Alkanes (Saturated):
    - Structure: Consists of **single bonds between carbon atoms.**
    - General Formula: C_nH_{2n+2}. Examples: Methane (CH_4) and ethane (C_2H_6).
    - Properties: Non-reactive; **used primarily as fuels.**
- ➤ **Alkenes (Unsaturated with Double Bonds):**
    - Structure: Contain **at least one double bond** between carbon atoms.
    - General Formula: C_nH_{2n}. Examples: Ethylene (C_2H_4) and propylene (C_3H_6).
    - Properties: More reactive than alkanes due to the double bond; **used in chemical synthesis** and as a precursor for plastics.
  - ○ Alkynes (Unsaturated with Triple Bonds):
    - Structure: Contain at **least one triple bond** between carbon atoms.
    - General Formula: C_nH_{2n-2}
    - Examples: Acetylene (C_2H_2).
    - Properties: Extremely reactive; used in welding (oxy-acetylene torches) and as a chemical building block.

Note:

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- ❍ **Aromatic Hydrocarbons (Arenes)**:
  - ● Structure: Contain **rings of carbon atoms** with alternating double bonds **(aromatic rings).**
  - ● Examples: Benzene (C6H6) and toluene (C7H8).
  - ● Properties: Stable due to their aromatic rings; used in the manufacture of dyes, detergents, and explosives.
- ➢ **Formation and Storage:**
  - ❍ Hydrocarbons occur naturally in **plants, trees, and fossil fuels**. Such compounds serve as the primary components of **petroleum and natural gas** and can be utilised in a wide range of different applications, such as **fuels, and the production of plastics**.
  - ❍ **Crude Oil** and **Natural gas** are found under **Sedimentary Rocks**.
  - ❍ These reservoirs are created when a **more resistant rock type overlays a less resistant one**, in effect creating a lid that causes hydrocarbons to **accumulate below it.**
  - ❍ Their formation takes place over millions of years. The process of formation is as follows:
    1. The dead plants and animals get buried underground providing the carbon content for the hydrocarbons to be formed.
    2. Eventually a layer of mud settles over the buried debris, and mud gets converted to rock.
    3. Intense heat and pressure changes transform this debris into fossil fuels. I.E. crude oil and natural gas.
    4. **The absence of oxygen and air** is an important requisite for the formation.
    5. If the rock is impervious the crude oil remains locked under the sedimentary rock.
    6. **Natural gas being less dense floats over the Crude oil.**

Globally Top Oil Producers and Consumers Country:	
➢ **The top 5 Oil Producers and share of total world oil production**	
Country	**Share of world total**
United States	22%
Saudi Arabia	11%
Russia	11%
Canada	6%
China	5%

➢ **The top 5 Oil Consumers and share of total world oil consumption**	
Country	**Share of world total**
United States	20%
China	15%
India	5%
Russia	4%
Saudi Arabia	4%

How are Hydrocarbons Accessed and Extracted?

- ➢ **Accessing Hydrocarbons:**
  - ❍ **Creating a Production Well:** The first task is to create a production well, the principal hole through which the reservoir will be drained to the surface. Its location is chosen to maximise the amount of drainage.
    - ● The well is created with a drilling machine.
  - ❍ **Casing and Cementing:** Steel casings narrower than the hole are lowered into the well and surrounded by **cement slurry to protect against cave-ins** and prevent fluid intrusion.
    - ● Drilling fluid, circulated around the drill bit, aids in cooling and removing rock cuttings.
  - ❍ **Blowout Prevention:** The pressure at which the drilling fluid is delivered has to be carefully controlled otherwise it could force the hydrocarbons in the source rock to rush out and erupt on the surface like a volcano of oil.
  - ❍ **Mud-logging:** It is the process of recording the rock cuttings by depth and studying their properties.
  - ❍ **Drilling:** It is done by drilling rigs, which also come with generators and batteries to power various steps of the drilling process.
    - ● These rigs can also be installed offshore, to boost their stability and aid extraction through the water column.
- ➢ **Extracting Hydrocarbons:**
  - ❍ **Completing Stage**: It is the process of draining out the hydrocarbons by removing the drill string from the borehole and punching small holes into the casing.
  - ❍ **Production Stage:** Systems at the **well's head control the outflow of hydrocarbons using valves.** Pump jacks are used to lift up hydrocarbons from the bottom of a well when the pressure difference is too low to bring the hydrocarbons to the surface.

Note:

Indian Sedimentary Basins

Tajikistan

Afghanistan

China

Pakistan

Nepal

Bhutan

Bangladesh

Myanmar

24
21
18
15
3
6
4
7
9
8
10
17
14
20
19
22
16
26
11
2
25
23
1
13
5
12

Legend
— 400 Isobath
········ Exclusive Economic Zone

Scale: 0 125 250 500 750 1,000 KM

Category - I
(Basins with 'Reserves' being produced and exploited)

Category - II
(Basins with 'Contingent Resources' to be developed and monetized)

Category - III
(Basins with only 'Prospective Resources' to be explored and discovered)

Pre-Cambrian basement/ Tectonic sediments

Shallow water areas (0-400 m Isobath)

Deepwater areas (> 400 m Isobath)

Un-assessed deepwater areas

Category - I Basins	Category - II Basins	Category - III Basins	
01. Krishna-Godavari (KG)	08. Saurashtra	13. Kerala-Konkan (KK)	20. Narmada
02. Mumbai Offshore	09. Kutch	14. Bengal-Purnea	21. Spiti-Zanskar
03. Assam-Shelf	10. Vindhyan	15. Ganga-Punjab	22. Deccan Syneclise
04. Rajasthan	11. Mahanadi	16. Pranhita-Godavari (PG)	23. Cuddapah
05. Cauvery	12. Andaman	17. Satpura- South Rewa-Damodar	24. Karewa
06. Assam-Arakan Fold Belt		18. Himalayan Foreland	25. Bhima-Kaladgi
07. Cambay		19. Chhattisgarh	26. Bastar

Note:

- Depending on the methods required to maintain production it can be split into **three phases: primary, secondary, and tertiary,**.
- **Primary phase** relies on natural processes, like pressure differences between the reservoir and the well.
- **Secondary phase** involves inducing artificial pressure in the rock to maintain the differential.
- **Tertiary phase** uses enhanced recovery methods like steam injection to extract remaining hydrocarbons.

➢ **Well Plugging and Decommissioning:**
  ❍ Well extraction doesn't require full depletion; it's stopped when it is no longer profitable. Abandoned wells must be plugged to prevent hydrocarbon and gas escape.
  ❍ Decommissioning, the permanent sealing of a well, is costly and often not financially viable for operators.

Sedimentary Basins in India

➢ There are **26** sedimentary basins in India, covering a total area of 3.4 million square kilometres.
➢ Of the total sedimentary area, 49% of total area is located onland, 12% in shallow water and 39% in the deepwater area.
➢ These basins are divided into three categories based on maturity of hydrocarbon resources as under:
  ❍ **Category-I**: Basins, which have **reserves** and are already producing.
  ❍ **Category-II**: Basins, which have **contingent resources** pending commercial production.
  ❍ **Category-III** Basins, which have **prospective resources** awaiting discovery.

Policies Related to Hydrocarbons Extraction in India

➢ **Hydrocarbon Exploration and Licensing Policy (HELP)** was approved by government as an exploration and production policy that replaced the **New Exploration Licensing Policy (NELP).**
  ❍ The objective of the policy is to **enhance domestic oil and gas production** by intensifying exploration activity and investment.
  ❍ The new policy promises **simpler rules, tax breaks, pricing and marketing freedom** and is part of a government strategy to double oil and gas output by 2022-23.
  ❍ The policy is also aimed at enhancing transparency and reducing administrative discretion.

  ❍ HELP marks the biggest transition from an era of government control to government support for upstream E&P in India. **Open Acerage Licensing Programme (OLAP)** removes restrictions on exploration by giving companies both the data and the discretion to explore areas of their choice.

Tiantong Project

Why in News?

Recently, **Chinese engineers** and scientists have created the **world's first satellite** enabling **smartphones** to make calls without mobile towers.

➢ It is **aimed at emergencies** where mobile connectivity may be disrupted, people can directly seek help by connecting to an overhead communication orbiter.

What is the Tiantong Project?

➢ **About:**
  ❍ The **Tiantong satellite initiative** represents a **strategic response** to the evolving landscape of telecommunications, characterised by the **increasing demand** for connectivity, especially in remote and disaster-prone regions.
  ❍ Each Tiantong satellite is designed to have a **lifespan of 12 years**, and its antenna undergoes daily temperature changes of up to 160 degrees Celsius while simultaneously transmitting and receiving **electromagnetic waves** in 800 different frequency bands.
  ❍ The **first satellite** of the **Tiantong-1 series** was launched in August 2016, with the second and third satellites following in 2020 and 2021.
    - The three satellites form a network in a **geosynchronous orbit** at an altitude of 36,000km, covering the **entire Asia-Pacific region** from the Middle East to the Pacific Ocean.
  ❍ In September 2023, Huawei Technologies launched the **world's first smartphone supporting satellite calls**, connecting directly to Tiantong satellites, followed by similar models from other companies.
  ❍ Chinese consumers have embraced these products, with Huawei alone selling tens of millions of units, surpassing **SpaceX's Starlink satellite** service with over 2 million global customers.

Note:

➢ **Need:**

   o The satellite concept arose following the 2008 <u>Sichuan earthquake</u>, where over 80,000 lives were lost due to communication breakdowns hindering rescue efforts.

   o The Chinese government initiated the **Tiantong Project**, a <u>satellite communication system</u>, in response to the disaster, symbolising a commitment to enhancing communication resilience.

➢ **Issues:**

   o Satellite communication with mobile phones is expected to become mainstream.However, experts argue that **challenges** may occur in its **implementation.**

   o **Since the 1970s**, most commercial communication satellite networks operated by the US, Europe, and international organisations have faced **significant disruptions** because their **signals overlap** with the receiving frequency band.

   o **A similar challenge** can occur in the case of the Tiantong Project. **For example,** to reach a small smartphone, the satellite must emit a powerful signal, but when many high-power signals flood the satellite's antenna simultaneously, they can **interfere, creating new signals.**

   o These randomly occurring signals can **deteriorate satellite call quality** and, in severe instances, **lead to system failure.**

   o This issue, known as **passive intermodulation (PIM)** among telecommunications engineers, has become a bottleneck for further development of satellite communication technology.

   o There is currently **no universally effective technology** to suppress the occurrence of PIM.

➢ **Solutions:**

   o To deal **with the issue of passive intermodulation (PIM)**, China's Tiantong Project has gathered communication technology elites from across the country.

   o The scientist observed that different metal components in huge satellite antennas come into contact with each other, leading to the main source of PIM.

   o Physicists explored **microscopic physical mechanisms** like **quantum tunnelling** and **thermal emission** at the contact interface, unveiling new physical laws for **silver-plated** and gold-plated microwave components.

   o They've created a **physical model** for predicting PIM effects with **exceptional precision** across different contact states, pressures, temperatures, vibrations, and external factors.

   o Scientists developed the **world's first universal PIM simulation software**, enabling the numerical analysis and evaluation of PIM generation in **complex microwave components** under external factors like electricity, heat, and stress with minimal error rates.

   o Engineers have used this powerful software to develop effective PIM suppression techniques, including **dielectric isolation capacitors** and optimised mesh antenna wire preparation and weaving methods.

   o It has enhanced the world's most sensitive PIM detection technology, capable of instantly pinpointing the source of weak PIM emissions, enabling satellites to receive signals from smartphones thousands of kilometers away.

Parkinson's Disease

Why in News?

Scientists have found a new **genetic variant** associated with <u>Parkinson's disease</u>, offering insights into the evolutionary roots of various familial forms of parkinsonism and paving the way for improved understanding and treatment of the condition.

What is Parkinson's Disease?

➢ **About:** Parkinson's disease is a **progressive <u>neurodegenerative disorder</u>** that impairs movement and can lead to immobility and dementia over time.

   o The disease usually **occurs in older people**, but younger people can also be affected. Men are affected more often than women.

   o The prevalence of PD has doubled in the past 25 years. India shares around **10%** of the global burden of Parkinson's disease.

➢ **Causes:** The exact cause of Parkinson's disease is not fully known yet, but it is believed to involve a **combination of genetic and environmental factors**.

   o It is primarily characterized by the loss of dopamine-producing neurons in the brain, leading to motor and non-motor symptoms.

➢ **Symptoms:** Motor symptoms include **slow movement, tremors, rigidity,** and walking difficulties.

○ Non-motor symptoms include cognitive issues, mental health disorders, sleep disturbances, pain, and sensory problems.

➤ **Treatment:** There is no cure for Parkinson disease, but therapies including medicines, surgery and rehabilitation can reduce symptoms.

○ **Levodopa/carbidopa,** a combination medicine that increases the amount of dopamine in the brain, is the most common medication.

➤ **World Parkinson's Day:** Every year, **11th April** is observed as World Parkinson's Day.

○ The day aims to amplify awareness and understanding about Parkinson's disease internationally.

What are the Current Major Advancements in Understanding Parkinson's Disease?

➤ Geneticists and neuroscientists are exploring genetic variations to understand Parkinson's better. Two primary approaches are used: linkage analysis and genome-wide association studies (GWAS).

○ **Linkage Analysis:** Focuses on rare families with **inherited parkinsonism**, identifying gene mutations associated with the disease.

● Recent research identified a new genetic variant called **RAB32 Ser71Arg** linked to Parkinson's in multiple families globally.

○ **Genome-wide Association Studies (GWAS):** Under this genetic data from Parkinson's patients and healthy individuals were compared, identifying over 92 genomic locations and 350 genes potentially related to Parkinson's risk.

What are the Other Key Neurological Diseases?
➤ Alzheimer's disease
➤ Multiple sclerosis (MS)
➤ Huntington's disease
➤ Cerebral palsy
➤ Guillain-Barre syndrome

PRATUSH Telescope

Why in the News?

Astronomers globally are anticipating a new era of exploration with **high-resolution telescopes** set to be placed on the moon and in orbit around it. Various proposals, like **India's PRATUSH (Probing ReionizATion of the Universe using Signal from Hydrogen)**, aim to open this new window to the universe.

What is PRATUSH?

➤ **About**:
○ PRATUSH is a **radio telescope** designed to be placed on the far side of the moon. It is built by Raman Research Institute (RRI), Bengaluru and **Indian Space Research Organisation (ISRO)**.
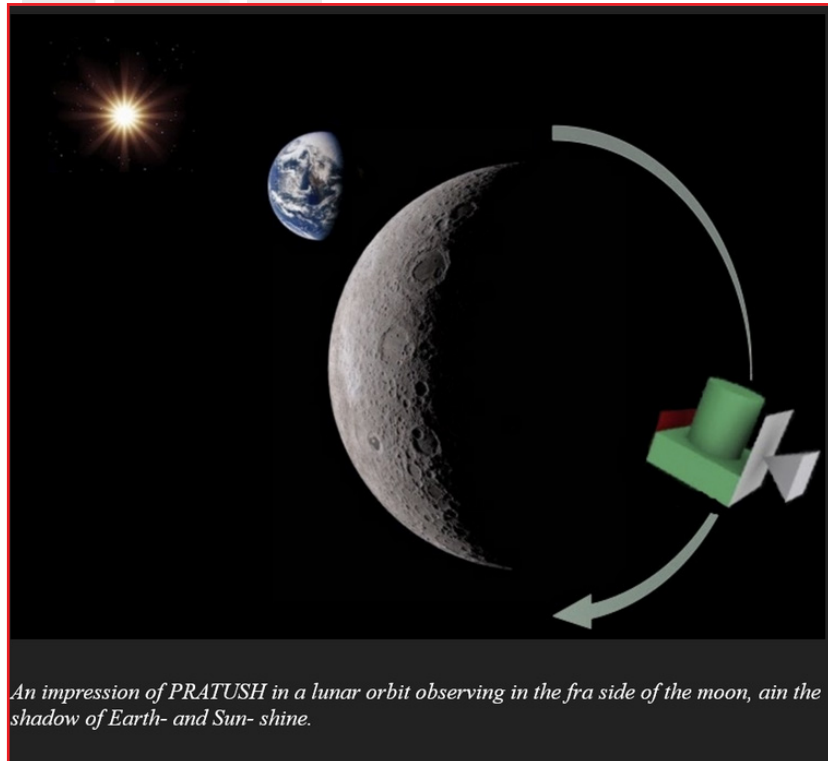
An impression of PRATUSH in a lunar orbit observing in the fra side of the moon, ain the shadow of Earth- and Sun- shine.

➤ **Objective:**
○ It aims to uncover the timing and characteristics of the first stars' formation in the universe, including the colour of the light during **Cosmic Dawn.**

Note:

○ It will unveil the evolution of our early universe from its initial cold gas state to the formation of stars, galaxies, and the universe as we observe it today **post-Big Bang.**

- The Cosmic Dawn marks the period when the **first sources of radiation,** such as stars and galaxies, formed in the universe.

➢ **Capabilities:**

○ PRATUSH will carry advanced radio equipment covering a wide frequency range from **30 to 250 MHz.**

- It will observe large sky areas continuously, recording detailed radio spectra with a resolution of **100 kHz.**

○ It includes a **custom-designed antenna, analog receiver, and digital correlator** for high-resolution spectral analysis.

- The goal is to achieve a sensitivity level of a few millikelvin with precise
- Millikelvins (mK) are a unit of measurement used to express temperature on the Kelvin scale, where **1 millikelvin is equal to 1000 of a Kelvin.**

○ It is designed for a **two-year mission** in a circumlunar orbit to avoid interference and achieve optimal radio sky measurements.

What are the Other Global Missions Related to Telescopes on the Moon?

➢ **Lunar Surface Electromagnetic Experiment (LuSEE) Night Project:** It is a collaboration between **NASA** and **Berkeley Lab** and aims to land on the moon's far side. It is scheduled for launch in December 2025.

➢ **NASA's Long-Baseline Optical Imaging Interferometer:** It will be launched in parts and be assembled on the moon's far side.

○ It will study magnetic activity in stars and galaxies using visible and ultraviolet wavelengths.

➢ **ESA's Argonaut:** European Space Agency plans to launch a **Radio Telescope** aboard its lunar lander, **'Argonaut',** by 2030, along with other projects focusing on **gravitational wave detection** and **infrared observations.**

➢ **China's Moon-Orbiting Radio Telescope:** China is set to launch a moon-orbiting radio **telescope in 2026,** positioning itself **at the forefront of lunar exploration** and astronomical research.

○ The **Queqiao-2 satellite,** deployed in lunar orbit, carries a 4.2-meter antenna for radio astronomy.

What are Telescopes?

➢ **About:** Telescopes are devices designed to gather and focus light to form **magnified images** of **distant objects.**

○ Developed over centuries, with early telescopes credited to inventors like Galileo Galilei and Johannes Kepler in the 17th century.

➢ **Function:** Telescopes **gather and magnify light from space,** allowing astronomers to study celestial objects in detail.

○ They help observe distant objects, map the sky, study cosmic events, detect exoplanets, and **explore different wavelengths of electromagnetic radiation,** enhancing our understanding of the universe.

○ Telescopes use **lenses or mirrors** to collect and concentrate light, resulting in an enlarged and **clearer view of celestial objects.**

➢ **Types of Telescopes:**

○ **Catadioptric or Compound Telescopes:** Combine both lenses and mirrors for focusing light.

- Examples: **Schmidt-Cassegrain and Maksutov-Cassegrain telescopes.**

○ **Radio Telescopes:** Detect radio waves emitted by celestial objects. Comprise large dish antennas and receivers.

- Example: Giant Metrewave Radio Telescope (GMRT), Pune.

○ **Space Telescopes:** It is a telescope in outer space used to observe astronomical objects.

- Examples: **Hubble Space Telescope** (a reflecting telescope) and the **James Webb Space Telescope** (a reflecting telescope**).**

Note: NASA is planning the next big space telescope, called the **Habitable Worlds Observatory (HWO).** This telescope focuses on **ultraviolet, visible, and near-infrared wavelengths,** ideal for searching for potentially habitable exoplanets. The project is currently in its initial development phase.

Surya Tilak Project Ram Lalla

Why in News?

The **Surya Tilak Project,** a remarkable endeavour, recently unfolded at **Ayodhya,** bringing sunlight to the forehead of **Sri Ram Lalla.**

Note:

What is the Surya Tilak Project?

➢ **About:**
○ The Surya Tilak Project represents a unique fusion of technology and tradition, meticulously engineered to **illuminate the forehead of Lord Ram's idol** with a precise **beam of sunlight** during the revered festival of **Ram Navami.**
○ The **Indian Institute of Astrophysics (IIA)** under the Department of Science and Technology was crucial in the Surya Tilak Project at Ayodhya.
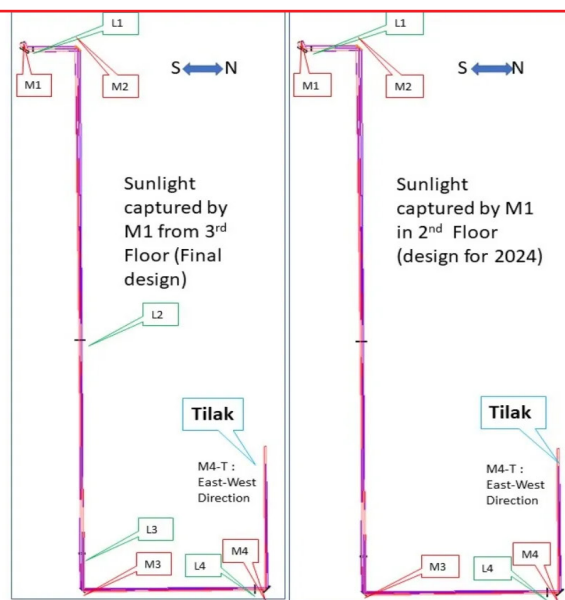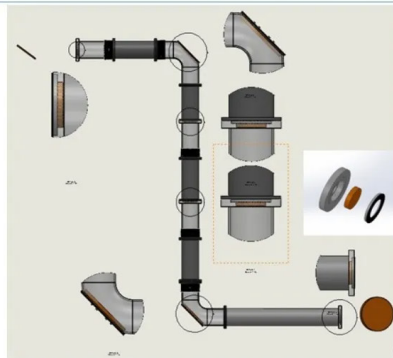
➢ **Calculation and Positioning**
○ The IIA team carried out the calculation of the sun's position, design, and optimisation of the optical system for the Surya Tilak Project.
○ The Ram Navami date varies each year following the **Gregorian calendar due to its solar nature,** while the **Hindu calendar is lunar-based.**

● The Gregorian calendar is based on **Earth's revolution around the Sun,** making it a solar calendar with roughly **365 days in a year,** whereas the **Hindu calendar is based on the Moon's revolution** around Earth, making it a **lunar calendar** with roughly **354 days in a year.**

➢ **Design and Implementation:**
○ The Surya Tilak Project's core is its **opto-mechanical system,** seamlessly **integrating optical and mechanical components** for precise sunlight manipulation.
● This opto-mechanical system, similar to a **periscope (**apparatus consisting of a tube attached to a set of mirrors or prisms, by which an observer can see things that are otherwise out of sight**),** uses a 19-gear system to make yearly adjustments for the sun's position.
● Every year, **one gear tooth is manually turned to adjust** the angle of the pickup mirror.
○ The number 19 corresponds to the **Metonic cycle,** which lasts **19 years and resets the system for the Moon's phases** to recur on the same days of the solar year.
○ The Surya Tilak with 4 mirrors and 2 lenses was executed, with IIA technical experts participating in testing, assembly, integration, and validation at the site.
○ The implementation of the optomechanical system at the site was done by **Central Building Research Institute (CBRI): Council of Scientific & Industrial Research (CSIR).**

How the system works

Concept: Periscope with Mirrors & Lenses
Number of mirrors: 4 (M1, M2, M3 and M4: Flat)
No tracking for Sun in East –West direction
Number lenses used : 4 (L1,L2, L3 L4)
M1 shifts position every year (19 year cycle)

Sunlight captured by M1 from 3rd Floor (Final design)

Tilak

M4-T : East-West Direction

Sunlight captured by M1 in 2nd Floor (design for 2024)

Tilak

M4-T : East-West Direction

Note:

➢ **Future Implementation**
  ❍ The final design of the Surya Tilak with 4 mirrors and 4 lenses will be implemented once the full temple is constructed, with the mechanism designed to accommodate a shift in the calendar date of Ram Navami.

➢ **Maintenance and Challenges:**
  ❍ An annual shift of the first mirror must be performed manually before Ram Navami every year, and the mechanism **will not work in the absence of sunlight due to clouds or rain.**

Indian Institute of Astrophysics (IIA)

➢ The IIA, established in 1786 in Madras and later moved to Kodaikanal in 1899, became the **autonomous Indian Institute of Astrophysics in 1971**.
  ❍ Its headquarters are now in **Bengaluru.**
➢ The institute is funded by the **Department of Science and Technology** and is a leading research and education institution in **astronomy and physics.**
➢ Its main observing facilities are located at **Kodaikanal, Kavalur, Gauribidanur, and Hanle.**
➢ The institute's activities include observational solar and atmospheric physics, nighttime astronomy with several telescopes, and the development of instruments.

Prostate Cancer

Why in News?

A recent Lancet Commission paper highlights the alarming **rise in prostate cancer cases in India**, leading to a higher mortality rate due to late-stage diagnosis.

➢ In India, a large number of patients are diagnosed with advanced-stage cancer, leading to a **65% mortality rate.**

➢ Globally, **prostate cancer cases are expected to double by 2040,** with low and middle-income countries facing the most significant rise, including India where new cases are projected to reach 71,000 annually.

What is Prostate Cancer?

➢ **About**: Prostate cancer is a type of cancer that develops in the **prostate, a small gland in the male reproductive system** located below the bladder. The prostate gland produces fluid that nourishes and transports sperm.

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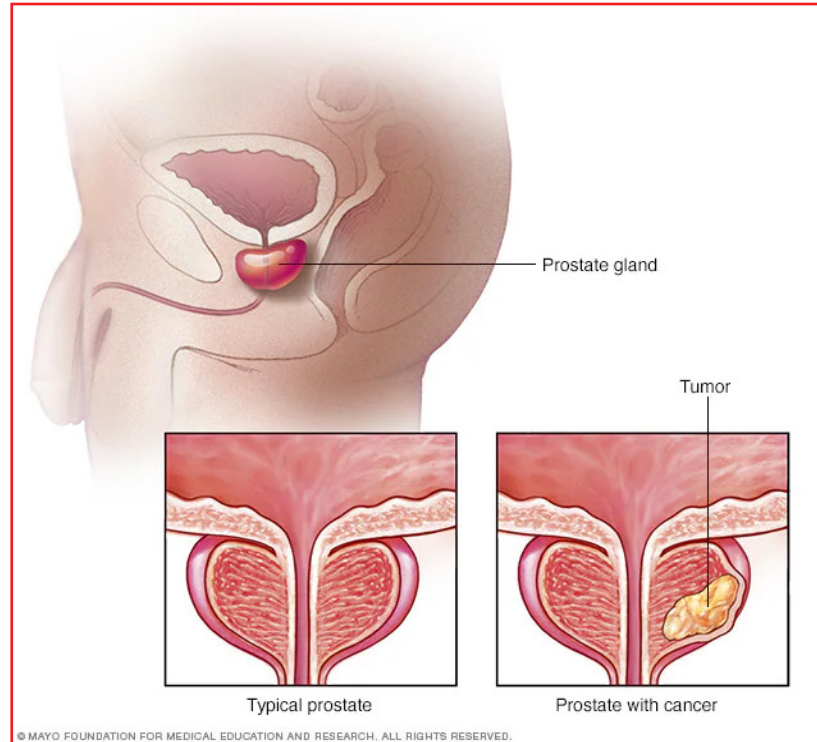
➢ **Prevalence:** The Lancet Commission report predicts a global surge in prostate cancer cases, with low and middle-income countries facing the most substantial increase.
  ❍ Worldwide, prostate cancer was responsible for approximately 3,75,000 deaths in 2020, ranking it as the **fifth leading cause of cancer-related deaths in men.**
  ❍ It currently accounts for **3% of all cancers in India**, with an estimated 33,000-42,000 new cases annually.
    ● Ageing populations and increasing life expectancy contribute to higher numbers of older men, increasing the risk of prostate cancer.

➢ **Risk Factors:** The risk factors for prostate cancer include age (especially over 50), genetics, diet, obesity, smoking, chemical exposure, prostate inflammation, and hormonal factors.

➢ **Symptoms:** Prostate cancer is typically **asymptomatic in its early stages,** but symptoms may include difficulty urinating, frequent urination (especially at night), blood in the urine, erectile dysfunction, and lower back or thigh pain.

➢ **Detection: Prostate-specific antigen (PSA)** blood test measures the level of PSA in the blood. **Elevated PSA levels can be a sign of prostate cancer,** but they can also be caused by other factors.

➢ Treatment:

❍ **Surgery**: Surgery to remove the prostate gland **(radical prostatectomy)** is a common treatment option.

❍ **Radiation therapy**: Radiation therapy uses high-energy rays to kill cancer cells.

❍ **Hormone therapy:** Also called androgen deprivation therapy (ADT), it is a treatment that **reduces the amount of testosterone in the body.**

❍ **Brachytherapy**: This treatment implants radioactive seeds directly into the prostate gland.

POEM-3 Mission and Space Debris

Why in News?

Recently, ISRO's **PSLV-C58/XPoSat mission** achieved **near-zero debris** in Earth's orbit by converting the final stage into the **PSLV Orbital Experimental Module-3 (POEM-3),** which then safely re-entered the atmosphere rather than remaining in orbit after completing its mission.

What is POEM?

➢ POEM is an innovative space platform developed by the **Vikram Sarabhai Space Centre (VSSC).**

❍ It repurposes the **fourth stage of a PSLV rocket** into a stable orbital station for conducting in-space scientific experiments with diverse payloads.

❍ Its inaugural use occurred during the **PSLV-C53 mission in June 2022**.

● Normally, the fourth stage of the PSLV becomes space debris after deploying satellites, but in the PSLV-C53 mission, it served as a stabilised platform for experiments.

❍ According to ISRO, POEM has a dedicated **Navigation Guidance and Control (NGC) system** for attitude stabilisation, which stands for controlling the orientation of any aerospace vehicle within permitted limits.

➢ **POEM-3 Mission:** It was launched as part of the **PSLV C-58 mission** on 1st January 2024.

❍ After deploying the XpoSat satellite, the fourth stage was transformed into POEM-3 and **lowered to a 350-km orbit,** significantly reducing the risk of space debris generation.

Note: ISRO first demonstrated the capability of using **PS4** (fourth stage of PSLV) as an orbital platform in 2019 with the **PSLV-C44 mission** that injected **Microsat-R** and **Kalamsat-V2 satellites** into their designated orbits. The **fourth stage in that mission was kept alive as an orbital platform for space-based experiments.**

What is Space Debris?

➢ **About**: Space debris in the **low earth orbit (LEO)** mainly comprises pieces of **spacecraft, rockets, and defunct satellites**, and the fragments of objects that have deteriorated explosively as a result of anti-satellite missile tests.

❍ The **LEO extends from 100 km above the earth's surface up to 2000 km above.**

❍ Debris also exists, but in smaller volumes, in the geosynchronous orbit (GEO), which is 36,000 km above the earth's surface.

➢ **Risk:** Space debris often flies around at high speeds of up to **27,000 kilometres** per hour. Due to their sheer volume and momentum, they **pose a risk to several space assets.**

❍ It also leads to two major risks, it creates unusable regions of the orbit due to excessive debris, and leads to the '**Kessler syndrome (**creation of more debris due to cascading collisions resulting from one collision).

❍ The **number of space objects** (debris or functional equipment) greater than 10 cm in size **in LEO is expected to be about 60,000 by 2030**, per ISRO estimates.

● The rise of private space agencies is exacerbating the problem.

➢ **Current Status:** According to **ISRO's Space Situational Assessment Report 2022**, the world placed 2,533 objects in space in 179 launches in 2022 alone.

❍ In 2022, three major on-orbit break-up events occurred, contributing to most of the debris created that year:
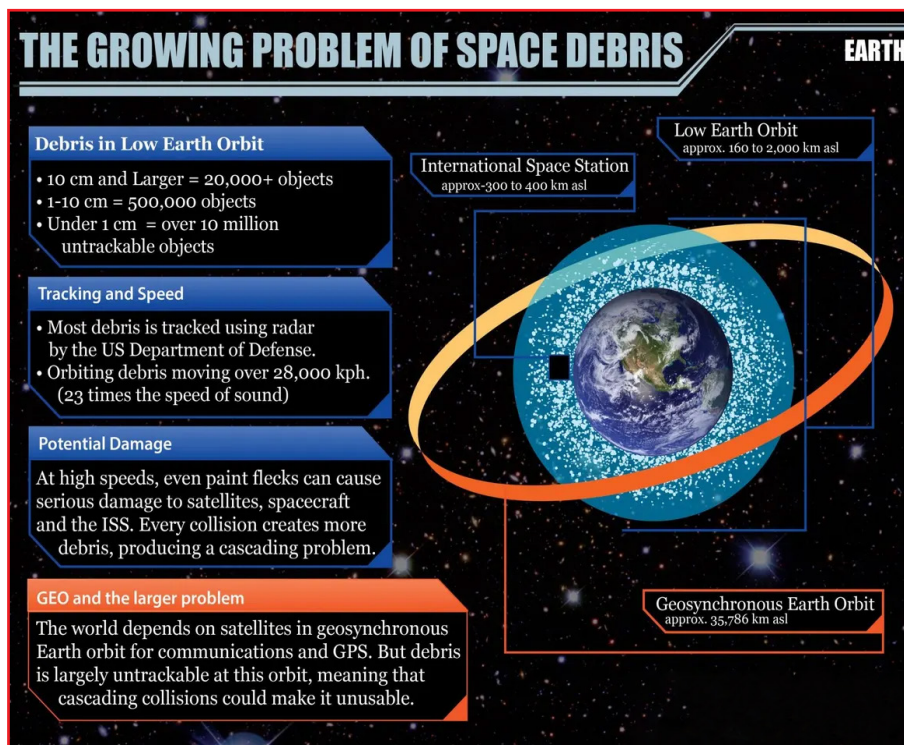
Note:

- **March 2022:** Intentional destruction of **Russia's Cosmos 1048** in an anti-satellite test.
- **July 2022:** Break-up of the upper stage of **Japanese H-2A** while deploying the GOSAT-2 satellite.
- **November 2022**: Accidental explosion of the upper stage of **China's Yunhai-3**.

❍ Other Related Events:
- NASA has recently confirmed that a mysterious object, which crashed into a home in Florida, was debris from the **International Space Station (ISS).**
- In 2023, an object discovered on the Western Shores of Australia was identified as debris from an ISRO rocket.

THE GROWING PROBLEM OF SPACE DEBRIS   EARTH

Debris in Low Earth Orbit
- 10 cm and Larger = 20,000+ objects
- 1-10 cm = 500,000 objects
- Under 1 cm = over 10 million untrackable objects

Tracking and Speed
- Most debris is tracked using radar by the US Department of Defense.
- Orbiting debris moving over 28,000 kph. (23 times the speed of sound)

Potential Damage
At high speeds, even paint flecks can cause serious damage to satellites, spacecraft and the ISS. Every collision creates more debris, producing a cascading problem.

GEO and the larger problem
The world depends on satellites in geosynchronous Earth orbit for communications and GPS. But debris is largely untrackable at this orbit, meaning that cascading collisions could make it unusable.

Low Earth Orbit approx. 160 to 2,000 km asl
International Space Station approx-300 to 400 km asl
Geosynchronous Earth Orbit approx. 35,786 km asl

➤ **Related International Space Laws:** Currently, there are **no international space laws** about LEO debris.

❍ However, most space-exploring nations abide by the **Space Debris Mitigation Guidelines 2002** specified by the **Inter-Agency Space Debris Coordination Committee (IADC),** which the UN endorsed in 2007.
- The guidelines outline methods to limit accidental collisions in orbit, break-ups during operations, intentional destruction, and post-mission break-ups.

Note: The Inter-Agency Space Debris Coordination Committee is an international governmental **forum for the worldwide coordination of activities** related to the issues of man-made and natural debris in space. **ISRO is a member agency.**

How are Countries Worldwide Dealing with the Problem of Space Debris?

➤ **India**: India is actively addressing space debris issues. Besides POEM missions, ISRO established a **Space Situational Awareness Control Centre** to safeguard valuable assets from collisions.

❍ **Project NETRA** is also an **early warning system in space to detect debris** and other hazards to Indian satellites.

❍ **Manastu Space**, an Indian startup, focuses on in-space refuelling, satellite de-orbiting, and extending satellite lifespan.

➤ **Japan**: Japan has a project, called the **Commercial Removal of Debris Demonstration (CRD2),** to tackle space junk.

➤ **Europe**: The European Space Agency (ESA) has adopted a '**Zero Debris charter,'** which includes multiple ways to mitigate space debris. It has also called for **zero space debris by 2030.**

➤ **USA**: NASA had instituted its **Orbital Debris Program in 1979** to find ways to create less orbital debris and design equipment to track and remove existing debris.

❍ Sixth U.S. Armed Forces wing, called the **Space Force**, tracks space debris and collisions in LEO.

■■■

Note:

Environment and Ecology

Highlights

Global Forest Watch (GFW)

Why in News?

Recently, the latest data from the **Global Forest Watch (GFW)** monitoring project has revealed that India has lost 2.33 million hectares of tree cover since the year 2000.

➢ This loss amounts to a 6% decrease in tree cover during this period.

What are the Key Findings of Global Forest Watch (GFW)?

➢ **Total Loss:** The GFW data reveals that India lost a staggering 4,14,000 hectares of humid **primary forest** (approximately 4.1% of the total tree cover) between 2002 and 2023.

   ○ A **primary forest** is a forest that **hasn't been damaged by human activity.**

➢ **Carbon Impact:** Over the same period (from 2001 to 2022), Indian forests emitted 51 million tons of carbon dioxide equivalent annually while simultaneously removing 141 million tons of carbon dioxide equivalent each year.

   ○ This **net carbon balance represents** a carbon sink of approximately 89.9 million tons annually.

➢ **Natural Forests:** A striking 95% of the tree cover loss in India between 2013 and 2023 occurred within natural forests.

➢ **Peak Years:** Notably, the maximum tree cover loss of 189,000 hectares occurred in 2017, followed by 175,000 hectares in 2016, and 144,000 hectares in 2023—the highest in the last six years.

➢ **State-Level Impact:** Five states accounted for 60% of all tree cover loss between 2001 and 2023.

   ○ **Assam** experienced the highest tree cover loss at 324,000 hectares (compared to an average of 66,600 hectares).

   ○ Mizoram, Arunachal Pradesh, Nagaland, and Manipur also faced significant losses.

➢ **Impact of Forest Fire:** Fires were **responsible for 1.6% of tree cover loss in India** between 2001 and 2022.

   ○ The year **2008 recorded the maximum tree cover loss due to fires,** amounting to 3,000 hectares.

   ○ From 2001 to 2022, **Odisha** had the highest rate of tree cover loss due to fires with an average of 238 hectares lost per year.

➢ **Tree Cover Loss and Climate Change:** Forests play a dual role, **acting as a sink by absorbing carbon dioxide when standing or regrowing,** and as a source when cleared or degraded.

   ○ The loss of forests accelerates climate change by releasing stored carbon into the atmosphere.

Status of Forest at the Global Level

➢ From 2002 to 2023, there was a total of 76.3 Mha (million hectares acre) **humid primary forest lost** globally, making up 16% of its total tree cover loss in the same time.

➢ From 2001 to 2023, there was a total of 488 Mha of **tree cover loss globally**, equivalent to a 12% decrease in tree cover since 2000.

➢ Globally from 2001 to 2022, 23% of tree cover loss occurred in areas where the dominant drivers of loss resulted in **deforestation.**

➢ Globally as of 2010, the **top 5 countries** represent 55% of all tree cover.

   ○ **Russia** had the most tree cover at 755 Mha compared to an average of 16.9 Mha followed by **Brazil, Canada, the US, Democratic Republic of Congo.**

➢ From 2001 to 2022, there was a total of 126 Mha **of tree cover lost from fires** globally and 333 Mha from all other drivers of loss.

Note:

GLOBAL TREE COVER GAIN

From 2000 to 2020, **131 Mha** of tree cover was gained **globally**.

1	Russia	37.2 Mha
2	Canada	17.0 Mha
3	United States	14.0 Mha
4	Brazil	8.06 Mha
5	China	6.69 Mha

GLOBAL TREE COVER BY TYPE

As of **2000**, 28% of **global** land cover was **>30%** tree cover.

● Natural Forest
3.76 Gha

● Plantations
234 Mha

● Other Land Cover
9.28 Gha

> **Initial Tree Cover:**
>   ○ In 2010, the world's tree cover spanned approximately 3.92 billion hectares (Gha), which translates to **roughly 30% of the Earth's land area.**
>   ○ This extensive tree cover included various types of forests, woodlands, and other vegetated areas with trees.
> **Tree Cover Loss:**
>   ○ Between 2010 and 2023, the world witnessed a significant loss of tree cover.
>   ○ The total global tree cover loss during this period amounted to 28.3 million hectares (Mha).
>   ○ This loss occurred **due to various factors**, including deforestation, land-use changes, and natural disturbances.

What are the Major Forest Conservation Initiatives in India?

> **Forest Cover in India:**
>   ○ The Forest Survey of India (FSI) has been conducting biennial (once every two years) assessments of forest cover since 1987, and the findings are published in the **India State of Forest Report (ISFR).**
>   ○ As per the latest assessment in **ISFR 2021**, India's total forest and tree cover stands at 8,09,537 square kilometres, which **accounts for 24.62% of the country's geographical area.**
>   ○ Notably, this represents an **increase of 2261 square kilometres** compared to the **ISFR 2019** assessment, indicating positive strides in forest conservation efforts.
> **Government Initiatives to Boost Forest Cover:**
>   ○ **National Action Plan on Climate Change** (NAPCC): It was launched in 2008 and aimed at creating awareness among the representatives of the public, different agencies of government, scientists, industry, and communities on the threat posed by climate change and the steps to counter it.
>   ● **National Mission for Green India**: It is one of the **eight Missions** outlined **under the NAPCC.**
>   ○ It aims at protecting; restoring and enhancing India's diminishing forest cover and responding to climate change by a combination of adaptation and mitigation measures.

○ **Nagar Van Yojana (NVY):** Launched in 2020, NVY aims to create 600 Nagar Vans and 400 Nagar Vatika in urban and peri-urban areas by 2024-25.

  ● **The initiative intends to enhance the green cover**, preserve biological diversity, and improve the quality of life for urban dwellers.

○ **Compensatory Afforestation Fund (CAMPA):** Utilised by States/UTs for compensatory afforestation to offset forest land diversion for developmental projects.

  ● 90% of the CAF money is to be given to the states while 10% is to be retained by the Centre.

○ **Multi-Departmental Efforts:** Apart from the central initiatives, afforestation activities are taken up under various programs and schemes of line Ministries, State Governments/UT Administrations, Non-Government Organizations, Civil Society, and Corporate bodies.

  ● Some notable efforts include participation in the **Mahatma Gandhi National Rural Employment Guarantee Scheme**, **National Bamboo Mission**, and **Sub-Mission on Agroforestry.**

○ **Draft National Forest Policy:** A draft National Forest Policy was released in 2019.

  ● The basic thrust of the draft is the conservation, protection and management of forests along with safeguarding the interest of tribals and forest-dependent people.

Note:

➢ The **Ministry of Environment, Forest & Climate Change** defines **'forest cover' in India** as "all lands, more than one hectare in an area with a **tree canopy density of more than 10%"**, and **'tree cover'** as "tree patches outside recorded forest areas** exclusive of forest cover and less than the minimum mappable area of one hectare".

➢ However, the **Supreme Court** recently has directed governments to follow the "broad and all-encompassing" **definition of forest as laid down in its 1996 judgment in the *T N Godavarman case***until a consolidated record of all kinds of forests across the country is prepared.

What is the Status of Forests in India?

➢ According to **the India State of Forest Report 2021,** the total forest and tree cover in India is **24.62% of the geographical area** of the country. The total forest cover is 21.71% and the total tree cover is 2.91%.

➢ Area-wise **Madhya Pradesh has the largest forest cover** in the country followed by Arunachal Pradesh, Chhattisgarh, Odisha and Maharashtra.

➢ In terms of forest cover as % of total geographical area, the top five States are Mizoram (84.53%), Arunachal Pradesh (79.33%), Meghalaya (76.00%), Manipur (74.34%) and Nagaland (73.90%).

➢ According to the **UN Food and Agriculture Organization (FAO)**, there were 6.26M people employed in India's Forestry sector in 2010.

➢ According to the FAO, the **forestry sector** contributed a net -690 million USD to the economy in 2010, which is approximately **-0.037% of India's GDP.**

➢ In India, **wood fibre or timber** represents the **largest plantation area** by type, spanning 5.92 Mha and 1.9% of land area.

  ○ **Lakshadweep** has the **largest relative plantation** area in India at 76%, most of which is in fruit plantations.

NABARD's Climate Strategy 2030

Why in News?

Recently, **National Bank for Agriculture and Rural Development (NABARD)** unveiled its **Climate Strategy 2030** document which aims to address India's need for **green financing**.

What is NABARD's Climate Strategy?

➢ **About:** NABARD's Climate Strategy 2030 is structured around four key pillars:

  ○ **Accelerating Green Lending:** Focusing on increasing green financing across various sectors.

  ○ **Market-Making Role:** Playing a broader role in creating a conducive market environment for green finance.

○ **Internal Green Transformation**: Implementing sustainable practices within NABARD's operations.

○ **Strategic Resource Mobilisation**: Mobilising resources effectively to support green initiatives.

➢ **Objective**: This strategy is designed to tackle the financial gap between the required investment for **sustainable initiatives** and the current inflow of green finance.

○ India requires approximately **USD 170 billion annually by 2030**, aiming for a cumulative total of over USD 2.5 trillion.

○ However, current green finance inflows are critically insufficient, with only about **USD 49 billion garnered as of 2019-20.**

○ Also, the majority of funds in India are earmarked for mitigation efforts, with only **USD 5 billion allocated towards adaptation and resilience.**

● This reflects minimal private sector engagement in these areas due to challenges in bankability and commercial viability.

Note:

➢ NABARD is the apex development bank focusing on rural sector finance in India.

➢ Established in **1982** under the **National Bank for Agriculture and Rural Development Act,** it provides financial support for agriculture, small industries, cottage industries, and rural projects as mandated by Parliament.

➢ It is headquartered in Mumbai.

What is Green Financing?

➢ **About**: Green financing refers to the mobilisation of financial resources to support investments that have a **positive environmental impact.**

○ These investments can range from **renewable energy** projects and **energy efficiency initiatives** to sustainable infrastructure development and **climate-smart agriculture**.

➢ **Significance:** The traditional financial system often prioritises short-term profits over long-term environmental sustainability. Green financing aims to bridge this gap by:

○ **Facilitating the Transition to a Low-carbon Economy:** By channelling funds towards renewable energy and clean technologies, green financing helps reduce reliance on fossil fuels and mitigate greenhouse gas emissions.

○ **Promoting Climate Adaptation and Resilience:** Investments in green infrastructure like **flood defences and early warning systems** can help communities adapt to the changing climate and reduce the impact of natural disasters.

○ **Unlocking New Economic Opportunities**: The shift towards a green economy creates new markets for clean technologies and sustainable practices, stimulating innovation and job creation.

➢ **Challenges Related to Green Financing:**

○ **High Initial Costs**: Green projects often require **higher initial investments** compared to conventional projects, which can deter investors despite long-term cost savings and environmental benefits.

○ **Mismatched Timeframes:** Green projects often have **longer payback periods** and may not align with short-term investment horizons or financial targets of investors and financial institutions.

○ **Lack of Standardisation and Greenwashing:** The absence of globally accepted standards for **green investment** leads to ambiguity and inconsistency in evaluating their environmental impact and financial performance.

● Also, without clear and standardised criteria, there is a risk of **greenwashing**, where **investments are misrepresented as environmentally friendly** without delivering substantial sustainability benefits.

How Green Financing Can be Improved?

➢ **AI-powered Risk Assessment for Green Projects:** Developing AI algorithms that can **assess the environmental and financial risks** associated with green projects with greater accuracy and efficiency.

○ This can encourage traditional financial institutions to participate in green financing.

➢ **Satellite Data-driven Sustainable Investment Decisions:** Leverage satellite imagery and data analytics to **assess the environmental impact of potential investments** in areas like deforestation or sustainable agriculture, providing investors with data-driven insights.

➢ **Green Infrastructure Bonds with Government Guarantees:** Developing green infrastructure bonds with **partial government guarantees** to mitigate risk for private investors and incentivise participation in large-scale sustainable infrastructure projects.

➢ **Micro-grants for Grassroots Green Initiatives:** Establishing micro-grant programs to support local communities in developing and implementing small-scale green projects like **rainwater harvesting**, **solar-powered irrigation, or community composting initiatives**.

➢ **Green Impact Scores for Financial Products:** Implementing a system where financial products earn **"green impact scores"** based on their environmental footprint. This allows consumers to make informed choices and prioritise green options.

Vultures at Risk in Protected Areas

Why in News?

Recent studies have found that **even vultures in protected areas** are **not safe** from toxic drugs like **Diclofenac**. Scientists investigated the feeding habits of vultures in India by analysing the DNA in vulture faecal samples from vulture nests and roosts across six states between 2018 and 2022.

➢ Vultures are known for their incredible ability to cover large distances while searching for food. These vast foraging territories may even expose them to diclofenac from neighbouring countries where the drug might still be in use.

What are the Key Facts About the Vultures Species in India?

➢ **About:**
  ○ It is **one of the 22 species** of large scavenger birds that live predominantly in the **tropics and subtropics.**

○ They act an important function as nature's garbage collectors and help to keep the environment clean of waste.
  ● They also play a valuable role in keeping **wildlife** diseases in check.

○ **India is home to 9 species of Vulture** namely the Oriental white-backed, Long-billed, Slender-billed, Himalayan, Red-headed, Egyptian, Bearded, Cinereous, and the Eurasian Griffon.

➢ **Decline in Population:**
  ○ A **significant decline** in vulture populations has been observed in South Asian nations, **particularly India, Pakistan, and Nepal.**
  ○ This decline is primarily attributed to the **widespread use of diclofenac**, a veterinary drug, during the late 1990s and early 2000s.
  ○ This resulted in a **population decline exceeding 97%** in some regions, creating a consequential ecological crisis.

➢ **Role of Vultures in Ecosystem:**
  ○ **Decomposition and Nutrient Cycling:**
    ● Vultures efficiently consume carrion (dead animals), **preventing carcasses from accumulating and rotting**.
    ● This **helps to decompose organic matter** and return nutrients back into the soil, which benefits plant growth and the overall health of the ecosystem.
  ○ **Disease Prevention:**
    ● Vultures have **incredibly strong stomachs with very acidic digestive juices**. This powerful acid **can kill bacteria and viruses** that can cause diseases like anthrax, rabies, and botulism, thus, acting as **true "dead-end" for pathogens.**
  ○ **Indicator Species:**
    ● Vultures are **sensitive to changes** in their environment. A decline in vulture populations can be **an indicator of a wider ecological problem**, such as pollution or a shortage of food sources.

Note:

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Sr. No.	Name of the Vulture Species	IUCN status	Pictorial Representation
1.	Oriental White-backed Vulture (Gyps Bengalensis)	Critically Endangered	
2.	Slender-billed Vulture (Gyps Tenuirostris)	Critically Endangered	
3.	Long-billed Vulture (Gyps Indicus)	Critically Endangered	
4.	Egyptian Vulture (Neophron Percnopterus)	Endangered	
5.	Red-Headed Vulture (Sarcogyps Calvus)	Critically Endangered	
6.	Indian Griffon Vulture (Gyps Fulvus)	Least Concerned	
7.	Himalayan Griffon (Gyps Himalayensis)	Near Threatened	
8.	Cinereous Vulture (Aegypius Monachus)	Near Threatened	
9.	Bearded Vulture or Lammergeier (Gypaetus Barbatus)	Near Threatened	

What are the Reasons Behind the Decline in Vulture Populations?

➢ **Drug Poisoning:**
  ○ The widespread use of veterinary drugs like **diclofenac, ketoprofen, and aceclofenac** in the **late 20th century** has had devastating consequences for vulture populations.
  ○ These drugs, commonly **used to treat pain and inflammation in livestock**, are **toxic to vultures** when they feed on carcasses of treated animals.
    ● **Diclofenac** in particular **causes fatal kidney failure** in vultures, and similar effects have been documented with ketoprofen and aceclofenac.

➢ **Secondary Poisoning:**
  ○ Vultures are scavengers, often consuming carcasses contaminated with **pesticides or other toxins**
    ● Vultures feeding on carcasses of animals hunted **with lead ammunition** can suffer fatal **lead poisoning**.
  ○ This "secondary poisoning" poses a significant threat, further declining their populations.

➢ **Habitat Loss:**
  ○ **Urbanisation, deforestation, and agricultural expansion** have led to habitat loss, destroying vulture nesting sites, roosting areas, and food sources. The lack of suitable habitat hinders their survival.

Note:

- **Collisions with Infrastructure:**
  - Vultures are vulnerable to collisions with power lines, wind turbines, and other man-made structures, leading to injuries or fatalities and contributing to population decline.
- **Poaching and Hunting:**
  - In some areas, vultures are **targeted due to cultural beliefs** or **illegal wildlife trade**, adding to their struggle to survive.
- **Disease Outbreaks:**
  - Diseases like **avian pox and avian flu** can also have a detrimental impact on vulture populations, leading to further decline.

What are the Vulture Conservation Efforts Taken by India?

- **Addressing the Drug Threat:**
  - **Ban on Diclofenac:** Recognising the devastating impact of **diclofenac**, India **banned its veterinary use in 2006**.
    - This was a critical step in protecting vultures from kidney failure caused by ingesting carcasses of treated livestock.
  - The **Ministry for Environment, Forests and Climate Change** launched a **Vulture Action Plan 2020-25** for the conservation of vultures in the country.
    - It will **ensure minimum use** of Diclofenac and **prevent the poisoning** of the principal food of vultures, the cattle carcasses.
  - **Expansion of the Ban:** In **August 2023,** India further **banned the use of ketoprofen and aceclofenac for veterinary purposes**, acknowledging their potential threat to vultures.
- **Captive Breeding and Reintroduction:**
  - **Vulture Conservation Breeding Centres (VCBCs):** India established a network of VCBCs, the **first being set up in Pinjore, Haryana in 2001.**
    - These centres **focus on the captive breeding of endangered vulture species**, providing a safe environment to raise healthy populations for reintroduction into the wild.
  - Currently, there are **nine Vulture Conservation and Breeding Centres (VCBC) in India**, of which three are directly administered by the **Bombay Natural History Society (BNHS)**.

- **Vulture Restaurant:**
  - In a proactive effort to conserve the declining vulture population in **Jharkhand,** a **'Vulture Restaurant'** has been established in **Koderma district.** The initiative aims to address the adverse impact of livestock drugs, particularly diclofenac, on vultures.
- **Other Vulture Conservation Initiatives:**
  - Vulture species are conserved under **the Integrated Development of Wildlife Habitats (IDWH) 'Species Recovery Programme'.**
  - The **Vulture Safe Zone programme** is being implemented at **eight different places in the country** where there were extant populations of vultures, including two in Uttar Pradesh.
  - **Bearded, Long-billed, Slender-billed, and Oriental white-backed** are protected in **Schedule 1** of the **Wildlife Protection Act 1972**. Rest are protected under 'Schedule IV'.
- **International Collaboration:**
  - **SAVE (Saving Asia's Vultures from Extinction):** The **consortium of like-minded, regional and international organizations**, created to oversee and co-ordinate conservation, campaigning, and fundraising activities to help the plight of South Asia's vultures.

Case Study on Bald Eagle of US

- The **American bald eagle** is a powerful symbol of resilience.
- Its population once declined significantly due to the **devastating effects of Dichlorodiphenyltrichloroethane (DDT)**, a powerful insecticide that **disrupted their reproduction**.
  - DDT resulted in female eagles laying **extremely thin-shelled eggs**, leading to **nesting failures**.
- In order to tackle the issue, a **nationwide ban on DDT for agricultural use** was implemented in 1972. This crucial step, along with the passage of the **Endangered Species Act in 1973**, provided much-needed protection for the eagles.
- **Hunting restrictions,** combined with **habitat preservation around nesting sites** and even **breeding programs**, allowed the bald eagle population to steadily recover.
- According to the US officials, bald eagle **numbers have quadrupled since 2009**. This success story culminated in the eagle's well-deserved delisting from the endangered species list in 2007.

Note:
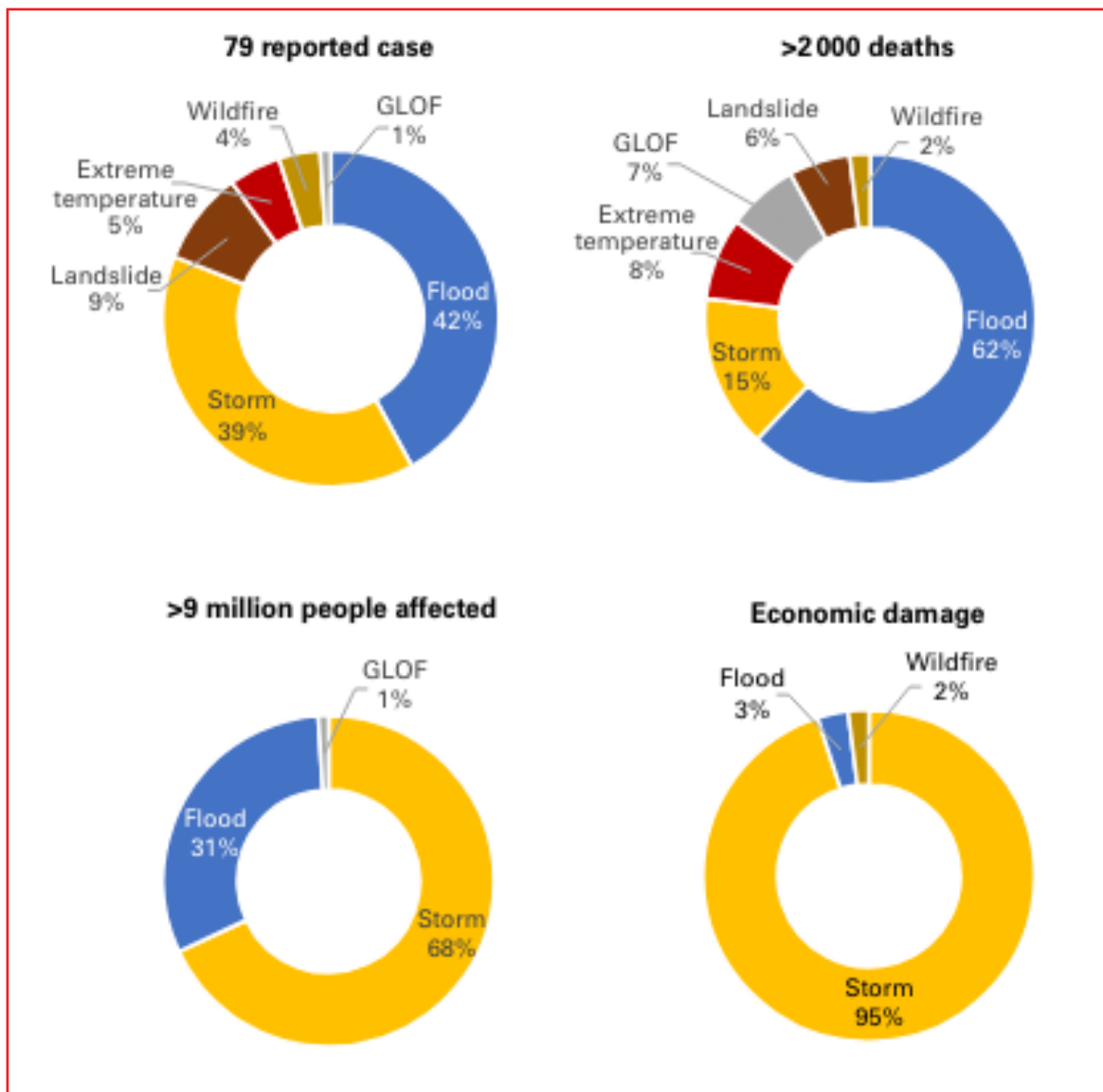
The State of the Climate in Asia 2023

Why in News?

The **World Meteorological Organization (WMO)** has released a report titled *"The State of the Climate in Asia 2023,"* which sheds light on the alarming impact of **climate change.**

➢ The report highlights the severe consequences of extreme weather events, rising temperatures, and environmental changes in the Asian continent.

What are the Key Highlights of the Report?

➢ **Asia as Most Disaster-Prone Region:**

○ Asia experienced 79 **extreme weather events** in 2023, affecting over nine million people.

  ● Over 2,000 deaths were directly attributed to these disasters.

○ **Floods** and storms caused the highest number of casualties and economic losses in Asia in 2023.

○ The report noted that Asia has **warmed faster than the global average** and the **warming trend has nearly doubled since the 1961-1990 period.**

○ The accelerating rate of key climate change indicators such as surface temperatures, **glacier retreat** and **sea level rise** will have major consequences for Asia, its economy and ecosystems, the report emphasised.

79 reported case

- GLOF 1%
- Wildfire 4%
- Extreme temperature 5%
- Landslide 9%
- Storm 39%
- Flood 42%

>2 000 deaths

- Wildfire 2%
- Landslide 6%
- GLOF 7%
- Extreme temperature 8%
- Storm 15%
- Flood 62%

>9 million people affected

- GLOF 1%
- Flood 31%
- Storm 68%

Economic damage

- Flood 3%
- Wildfire 2%
- Storm 95%

Note:

➢ **Impacts on India:**

  ○ India faced severe **heatwaves,** rainfall-induced floods, **glacial lake outbursts,** and **tropical cyclones.**

  ○ In April and June 2023, severe heat waves led to approximately 110 deaths due to **heatstroke,** with temperatures reaching 42-43 degrees Celsius in certain regions.

    ● A **prolonged heatwave also affected much of Southeast Asia in April and May**, extending westwards in Bangladesh and eastern India, and parts of China too.

  ○ Flood events in August 2023 resulted in significant deaths in Himachal Pradesh and Uttarakhand, **causing extensive damage to infrastructure and agriculture**.

  ○ Six tropical cyclones formed in the North Indian Ocean, with four making landfall in India.

    ● The cyclone activity was slightly above the average, the report noted. Four out of the six cyclones – **Mocha, Hamoon, Midhili** and **Michaung** – formed over the Bay of Bengal and two – **Biparjoy and Tej** – formed over the **Arabian Sea.**

  ○ The eastern and northern parts of India witnessed the highest temperature rise compared to the 1991-2021 average.

  ○ The Sea level rise in the **Bay of Bengal was 30% above the global average,** particularly in the **Sundarbans** region, and was among the highest in the region.

EXTREME WEATHER EVENTS IN INDIA LAST YR

■ **APRIL-JUNE:** Severe heatwave, 110 people dead from heatstroke.

■ **OCTOBER:** Glacial lake outburst flood in Sikkim; 40 deaths

■ **AUGUST:** Floods in Himachal, Uttarakhand; 25 deaths, agri, infra damaged.

■ **DECEMBER:** Cyclone Michuang makes landfall in Andhra; 22 deaths

➢ **Soaring Temperatures and Melting Glaciers:**

  ○ The annual mean near-**surface temperature** over Asia in 2023 was the second-highest on record.

  ○ **The High Mountain Asia region,** containing the largest volume of ice outside of the polar regions, is under threat due to melting glaciers.

➢ **Below-Normal Precipitation and Killer Floods:**

  ○ Precipitation was below normal across almost the entire Asian region in 2023.

  ○ Despite overall less precipitation, over **80% of reported hydrometeorological hazards in Asia were flood and storm events,** leading to fatalities and affecting millions.

    ● Floods were the leading cause of death in reported events, particularly in India, Yemen, and Pakistan.

Note:

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➢ **Need for Robust Climate Finance:**
  ❍ The report emphasises the need for robust climate finance mechanisms to scale up adaptation and address loss and damage in developing countries of Asia.

World Meteorological Organisation

➢ The WMO is a **specialised agency of the United Nations,** serving as the authoritative voice on Earth's atmosphere, oceans, climate, and water resources.
➢ The WMO originated from the **International Meteorological Organisation (IMO),** a non-governmental organisation that became a specialised agency of the United Nations in 1951.
  ❍ This transformation allowed it to better address the international aspects of meteorology.
➢ WMO's primary **headquarters is located in Geneva, Switzerland,** and it boasts a membership of 192 Member States and Territories, **including India.**
➢ The governance structure of WMO comprises the **World Meteorological Congress** as the supreme body.
➢ WMO is organised into six regional associations and eight technical commissions, each focusing on specific aspects of meteorology, hydrology, and related sciences.
➢ On 23rd March, the WMO celebrates the establishment of the Convention on 23 March 1950 as **World Meteorological Day**.
  ❍ It highlights the important role of National Meteorological and Hydrological Services for society's safety and well-being and is marked with global activities.

What are the Initiatives Related to Climate Change Mitigation?

➢ **India:**
  ❍ **National Action Plan on Climate Change (NAPCC).**
  ❍ **State Action Plan on Climate Change (SAPCC).**
  ❍ **National Adaptation Fund on Climate Change (NAFCC).**
  ❍ **Nationally Determined Contributions (NDC).**
➢ **Global:**
  ❍ Loss and Damage Fund
  ❍ Global Climate Change Alliance (GCCA):
    ● The GCCA is an **European Union initiative** to form an alliance with poor developing countries most affected by climate change.

● It operates through the European Commission's political channels and in 2015 evolved into the **GCCA+ to support the Paris Agreement** and the **2030 Agenda for Sustainable Development.**
  ❍ Momentum for Change: Climate Neutral Now
    ● It is an initiative launched in 2015 by the **United Nations Framework Convention on Climate Change (UNFCCC) Secretariat.**
    ● The initiative aims to encourage and support governments, organisations, and businesses to take action towards achieving climate neutrality.

India's Climate Target

➢ Reach 500 GW of Non-fossil energy capacity by 2030.
➢ 50% of its energy requirements from renewable energy by 2030.
➢ Reduction of total projected carbon emissions by 1 billion tonnes from now to 2030.
➢ Reduction of the carbon intensity of the economy by 45% by 2030, over 2005 levels.
➢ Achieving the target of net zero emissions by 2070.

Sustainable Finance for Tiger Landscapes Conference

Why in News?

The Bhutanese government hosted the **Sustainable Finance for Tiger Landscapes Conference** on **Earth Day 2024** to mobilise **USD 1 billion** over the next decade for conserving tigers and their habitats **across Asia.**

What is the Sustainable Finance for Tiger Landscapes Conference?

➢ **About:**
  ❍ The two-day conference will be hosted by Bhutan under the patronage of the country's queen, Jetsun Pema Wangchuck.
  ❍ It seeks to **mobilise the amount of USD 1 billion** over 10 years for the **preservation of tiger landscapes.**
    ● The conservation of tiger landscapes is vital to **maintaining biodiversity**, sequestering carbon, supplying resources to over 100 million people, and ensuring the overall health of the planet.
  ❍ The conference convened **tiger range countries**, visionary private and public sector donors, international development agencies, the **Tiger Conservation Coalition**, and other conservation organisations.

Note:

TIGER

Royal Bengal Tiger (Panthera Tigris) is the National animal of India.

Subspecies of Tiger

* The continental *(Panthera tigris tigris)*
* The Sunda *(Panthera tigris sondaica)*

Habitat

Tropical rainforests, evergreen forests, temperate forests, mangrove swamps, grasslands, and savannas

Countries Where Tiger Population Is Found

▣ Found only in **13 Tiger Range countries-** India, Nepal, Bhutan, Bangladesh, Myanmar, Russia, China, Thailand, Malaysia, Indonesia, Cambodia, Laos, and Vietnam
  ◆ As per the latest report by IUCN, tiger has gone extinct in Cambodia, Laos, and Vietnam

Protection Status

▣ **IUCN Red List:** Endangered
▣ **CITES:** Appendix I
▣ **WPA 1972:** Schedule I

Threats

▣ Habitat loss
▣ Poaching and illegal trade
▣ Human-Wildlife conflict

Conservation Efforts

▣ **International Big Cats Alliance (IBCA):** For conservation of seven big cats namely Tiger, Lion, Leopard, Snow Leopard, Cheetah, Jaguar and Puma (launched by India)
▣ **Tx2 campaign:** Launched by WWF; stands for 'Tiger times 2' signaling the goal to double the tiger population by 2022
▣ **National Tiger Conservation authority (NTCA):** Constituted under the WPA, 1972
▣ **Project Tiger:** Launched in 1973
▣ **Tiger Census:** Every 4 years

Tigers In India

▣ India has the **largest** population
  ◆ As of 2022, India has 3167 tigers
  ◆ Largest population has been found in Central Indian Highlands & Eastern Ghats Landscape
▣ **Tiger Reserves:** India now has 53 tiger reserves
  ◆ **Ranipur in UP** is the latest
  ◆ **Nagarjun Sagar** (Andhra Pradesh) **is the largest** while Orang (Assam) **is the smallest** (Core area)

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➤ **Key Highlights from the Conference:**
- ❍ High-level representatives from **ten tiger range countries** delivered statements on the progress and ambitions for conserving their tiger landscapes**.**
- ❍ The conference culminated with the **Paro Statement** by the Royal Government of Bhutan reiterating it's objective.

➤ **Other Sources of Funding:**
- ❍ Since 2010, the **Global Environment Facility** has provided more than USD 197 million in financing and mobilized another USD 880 million, in co-finance, for tiger conservation.

International Big Cat Alliance (IBCA)

➤ **About:**
- ❍ India has proposed to launch a **mega global alliance** under its leadership to protect **big cats** and assured support **over five years** with guaranteed funding of **USD 100 million**.
- ❍ The proposed **International Big Cat Alliance (IBCA)** will work towards the protection and conservation of the seven major big cats — **tiger, lion, leopard, snow leopard, puma, jaguar and cheetah**.
- ❍ Membership to the alliance **will be open to 97 "range" countries**, which contain the **natural habitat of these big cats**, as well as other interested nations, international organisations, etc.
  - ● The alliance was inspired by the **arrival of cheetahs in 2022 from Namibia.**
- ❍ **India** is the **only country** in the world **to have tigers, lions, leopards, snow leopards and cheetahs** in the wild **except for the pumas and jaguars**.
  - ● So, it is only befitting that India takes the lead to bring together all big cat range countries under an **United Nations(UN)**-like organisation.

➤ **Structure of IBCA:**
- ❍ A General Assembly consisting of all member countries.
- ❍ A council of at least seven but not more than 15 member countries elected by the General Assembly for a term of 5 years, and a Secretariat.
- ❍ General Assembly will appoint the **IBCA Secretary General for a specific term.**

What are Global Initiatives for Tiger Conservation?

➤ **Integrated Tiger Habitat Conservation Programme (ITHCP)**

➤ **St. Petersburg Declaration on Tiger Conservation**

➤ **Global Tiger Forum**

➤ **Global Tiger Initiative (GTI)**

➤ **Tiger Conservation Coalition:**
- ❍ It is an **independent group** of organizations that have worked extensively together on major tiger assessments.
- ❍ Its member organizations include the **International Union for the Conservation of Nature (IUCN)**, **Trade Related Analysis of Fauna and Flora in Commerce (TRAFFIC)**, the **United Nations Development Programme** and the **World Wildlife Fund.**

Green Credit Program

Why in News?

Recently, the **Ministry of Environment Forest and Climate Change(MoEFCC)** has clarified that under the **Green Credit Program(GCP)** primacy must be accorded to **restoring ecosystems** over merely tree planting.

What is the Green Credit Program?

➤ **About:**
- ❍ **Green Credit Program (GCP)** is an innovative market-based mechanism designed to incentivize voluntary environmental actions across diverse sectors, by various stakeholders like individuals, communities, private sector industries, and companies.
- ❍ It is designed to foster a sustainable lifestyle and environmental conservation as part of the **'LiFE' initiative** announced by the **Prime Minister** in United Nations Climate Change Conference of the Parties (COP26).

➤ **Covered Activities:** The Green Credit program encompasses **eight key types** of activities aimed at enhancing environmental sustainability:
- ❍ **Tree Plantation:** Planting trees to increase green cover and combat **deforestation.**

Note:

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- ❍ **Water Management:** Implementing strategies to efficiently manage and conserve water resources.

- ❍ **Sustainable Agriculture:** Promoting eco-friendly and **sustainable agricultural** practices.

- ❍ **Waste Management:** Implementing effective waste management systems to reduce environmental **pollution.**

- ❍ **Air Pollution Reduction:** Initiatives aimed at reducing **air pollution** and improving air quality.

- ❍ **Mangrove Conservation and Restoration:** Protecting and restoring **mangrove** ecosystems for ecological balance.

➢ **Governance and Administration:**

- ❍ The operational framework of the Green Credit Programme involves a process where both individuals and corporations are given the opportunity to contribute financially to the restoration efforts of forests deemed 'degraded'.

  - ● This is facilitated through applications to the **Indian Council of Forestry Research and Education (ICFRE)**, an independent entity under the Environment Ministry.

  - ● The ICFRE is responsible for overseeing the **financial contributions** directed towards **forest restoration**, which is then executed by the respective State forest departments.

- ❍ Post the afforestation efforts, a period of **two years** is observed, after which the ICFRE conducts an **assessment** of the planted trees.

  - ● Upon successful evaluation, each tree is assigned a value equivalent to **one 'green credit'.** These accrued green credits can then be utilised by the funding organisation in a couple of ways:

    - ■ Firstly, they can serve as a **compliance mechanism** for organisations that have been mandated by **forest laws** to offset the diversion of forest land for non-forestry purposes by providing a comparable area of land for afforestation.

    - ■ Alternatively, these credits can be employed as a **metric for reporting** adherence to **environmental, social, and governance (ESG) standards** or fulfilling **Corporate Social Responsibility (CSR)** obligations.

➢ **Earning and Calculation of Green Credit:** To earn Green Credits, participants **need to register** their environmental activities through a dedicated website.

- ❍ The activities will then be subject to verification by a **designated agency**. Based on the agency's report, the administrator will grant the applicant a **certificate of Green Credit.**

- ❍ The calculation of Green Credit is determined by factors such as resource requirements, scale, scope, size, and other relevant parameters necessary to achieve the desired environmental outcomes.

➢ **Green Credit Registry and Trading Platform:** A critical component of the program is the establishment of a **Green Credit Registry,** which will help track and manage earned credits.

- ❍ Additionally, the administrator will create and maintain a trading platform, enabling the trading of Green Credits on a domestic market.

➢ **Significance:**

- ❍ **Aligned India's Environmental Policies:** India's environmental policies, such as the **Environment Protection Act, 1986,** and the **National Environment Policy, 2006**, provide a framework for protecting and improving the environment.

  - ● These policies, alongside the GCP, aim to safeguard forests, wildlife, and the overall natural environment.

- ❍ **Aligned with India's Climate Goals:** The GCP is part of India's efforts to adhere to international commitments, such as those made during **COP26.**

  - ● It complements the **Carbon Credit Trading Scheme** introduced by the **Energy Conservation (Amendment) Act, 2022**, and broadens the scope of tradable credits beyond CO2 reductions to include a range of sustainable practices.

- ❍ **Aligned with Global Ecosystem Restoration Initiatives:** The GCP aligns with the **UN Decade on Ecosystem Restoration (2021-2030)**, which emphasises the scaling up of restoration efforts.

  - ● India's approach in this regard includes involving all stakeholders in the restoration process and **leveraging traditional knowledge** and conservation practices.

Note:

Does the Green Credit Program Also Cover Carbon Credits?

➢ The Green Credit program operates independently of the <u>**carbon credits**</u> provided under the <u>**Carbon Credit Trading Scheme, 2023,**</u> which is governed by the <u>**Energy Conservation Act of 2001.**</u>
  ○ **Carbon credits**, also known as carbon offsets, are permits that **allow the owner to emit** a **certain amount of carbon dioxide** or other greenhouse gases.
    ● One credit permits the emission of 1 ton of carbon dioxide or the equivalent in other greenhouse gases.
➢ An environmental activity generating Green Credits may have climate co-benefits, such as reducing or removing carbon emissions, which can potentially lead to the acquisition of carbon credits in addition to Green Credits.

What are the Challenges With the Green Credit Program?

➢ **Impact on Forest Ecology:** Critics have raised concerns that the Green Credit Rules could be **detrimental to forest ecology**. The rules direct state forest departments to identify **'degraded land parcels'** for tree plantation to generate green credits.
  ○ However, this approach has been criticised as **unscientific and potentially disastrous** for local ecosystems.
  ○ The use of terms like 'degraded' for scrubland and open forests is considered **vague** and could lead to **industrial-scale plantations** that may irreversibly alter soil quality, replace <u>**local biodiversity**</u>, and harm ecosystem services.
➢ **Creation of Green Deserts:** There is a fear that the Green Credit Rules might lead to the creation of **'green deserts'**.
  ○ This term refers to areas where tree plantations are established without considering the ecological complexities and biodiversity of the original landscape.
  ○ Such plantations can **disrupt the balance of ecosystems** and do not support the diverse range of species that a natural forest would.
  ○ The rules have been criticised for measuring forests solely by **tree count,** which overlooks the multi-layered structure of a functional forest and its associated wildlife.
➢ **Methodological Concerns:** The methodology for generating green credits, particularly through tree planting, has been questioned for its environmental soundness.

○ Critics are concerned that the methodology does not adequately address potential **regulatory gaps** and could lead to environmental degradation.
➢ **Pressure on 'Wastelands':** The emphasis on planting trees on 'degraded land parcels' puts pressure on areas often categorized as <u>**wastelands**</u>, which are ecologically important.
  ○ These areas, like <u>**grasslands**</u>, play a crucial role in carbon sequestration and supporting unique biodiversity. The push for afforestation in these areas could lead to a loss of endemic species and ecological functions.

Swiss Women Climate Change Case

Why in News?

The recent ruling by the **European Court of Human Rights (ECHR)** in favour of a group of Swiss women has significant implications for <u>**climate change**</u> litigation.

What was the Swiss Women Climate Change Case?

➢ **Petitioners:** The case was brought against the Swiss government by **KlimaSeniorinnen Schweiz (Association of Senior Women for Climate Protection Switzerland)**, a group of women climate activists all above the age of 64.
➢ **Claim:** The women argued that the **Swiss government's inadequate climate policies violate their right to life** and other guarantees under the **European Convention on Human Rights.**
➢ **Medical Vulnerability:** The petitioners highlighted their medical vulnerability as senior citizens to <u>**extreme heat**</u> caused by climate change.
  ○ Reports by the <u>**Intergovernmental Panel on Climate Change (IPCC)**</u> show that the Swiss population of senior women, especially those **over 75 are more prone to heat-related medical problems** like 'dehydration, hyperthermia, fatigue, loss of consciousness, heat cramps and heat strokes.
➢ **Court's Verdict:**
  ○ The ECHR noted that individuals have the right to effective protection from the serious adverse effects of climate change on their lives, health, well-being, and quality of life under **Article 8 of the convention.**
    ● Article 8 of the Convention of Human Rights **includes the right for individuals to be protected by the state from the serious effects of climate change** on their lives.

Note:

o The court found that the **Swiss government had not enacted adequate laws** to combat climate change impacts and failed to meet <u>**greenhouse gas (GHG) emission**</u> goals.

➢ **Significance of Ruling:**

o The **ECHR's verdict applies to 46 member states, including all European Union countries, plus the United Kingdom (UK) and various other non-EU countries.**

● Climate and human rights cases in European courts must now heed ECHR's judgement, potentially spurring similar filings across member countries.

o The global rise in climate litigation saw 2,180 cases filed by 2022, increasing from 884 in 2017 and 1,550 in 2020, according to the **Global Climate Litigation Report: 2023 Status Review.**

● This trend could spur further accountability, with judgments potentially impacting climate litigation worldwide.

o The ruling emphasises the need to align policies with climate science.

Similar Cases

➢ In 2017, a 9-year-old girl from Uttarakhand filed a case in India, arguing that the **country's environmental laws and climate policies require greater action** to address climate change. However, her petition was ultimately rejected.

➢ In August 2023, Montana youths won a case against the state government, which **neglected climate change while approving <u>fossil fuel</u> projects,** violating their constitutional right to a clean environment.

Protection Rights in India against Climate Change Impact:

➢ The Indian Supreme Court broadened the scope of <u>**Articles 14 (right to equality)**</u> and <u>**21 (protection of life and personal liberty),**</u> stating that **people have the right to be free from the adverse effects of climate change.**
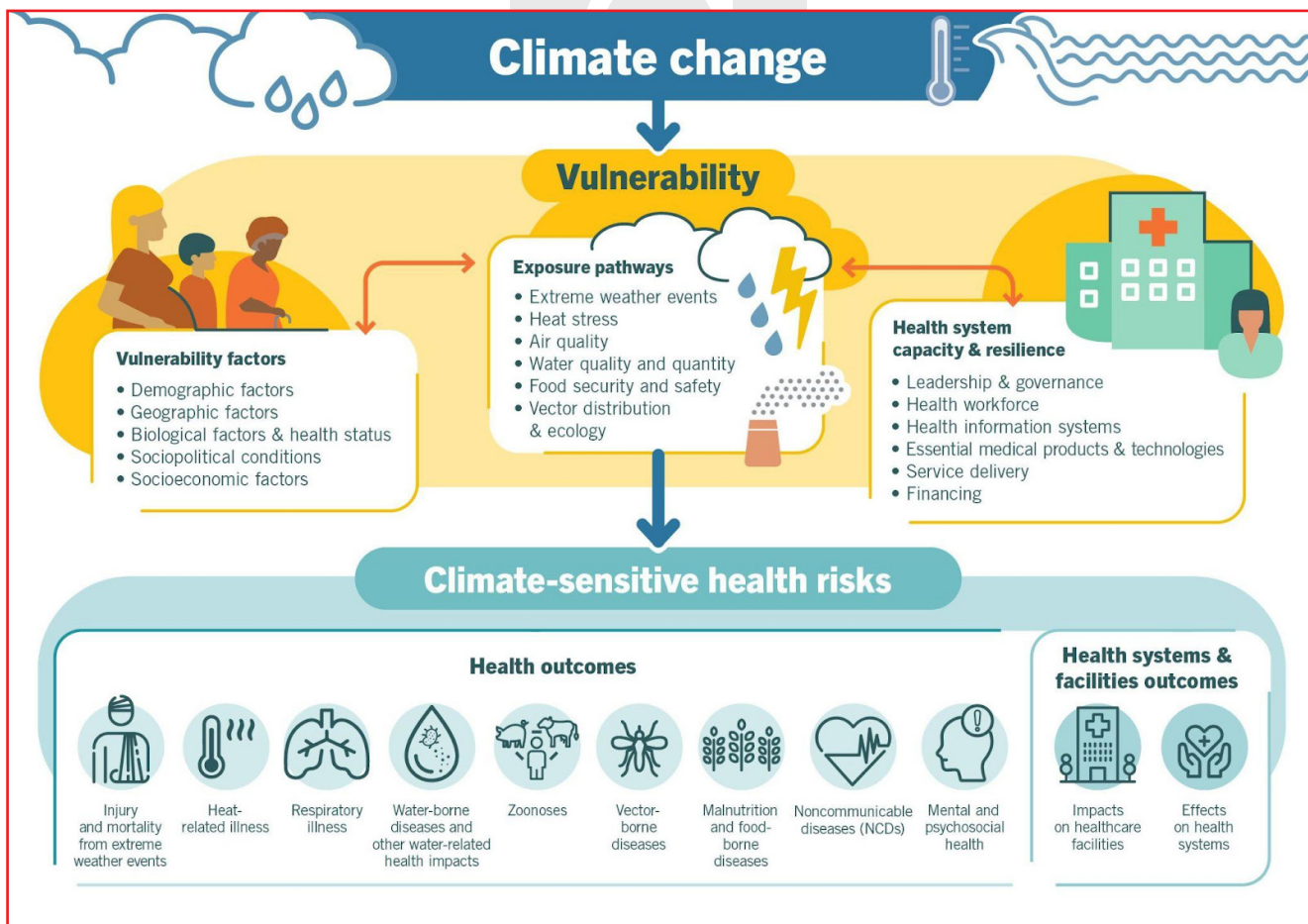
Note:

Tool-Using Fish Species Found in the Laccadive Sea

Why in News?

Recent findings indicate that **three fish species** (**Jansen's wrasse, checkerboard wrasse, moon wrasse**) in the **Laccadive Sea,** off the southwest Indian coast, **exhibit tool-use capabilities.**

Which are the Three Tools Using Fish Species?

➢ **About:**

○ While primates, **birds**, **otters**, **octopuses**, and many other animals are known to be capable of using tools.

- The **use of tools by fish seems impossible,** as they lack hands, claws, or tentacles **to grasp and manipulate objects.**

○ However, the three fish species use **live or dead coral structures** as **anvils** to break the hard shells of **sea urchins** so they can get to the edible bits inside.

- The **Jansen's wrasse** *(Thalassoma jansenii)* and the **checkerboard wrasse** *(Halichoeres hortulanus)* have never been reported using tools before.

- On the other hand, this is the first documented instance of the **moon wrasse** *(Thalassoma lunare)* using tools in the wild.

➢ **Sea Urchins & the Discovery:**

○ Due to their **spiny, hard shells**, only a limited number of fish could consume **E. molaris sea urchins.**

○ However, Jansen's, checkerboard, and moon wrasses were **observed using tools** to crack open the **urchin skeletons**, much like cracking open a walnut shell.

○ **Wrasses** don't have specialised mouthparts like **archerfish (tool using fish)**, so they use **clever behaviours** to eat burrowing sea urchins.

- They carefully **turn the urchin over** to reach its softer underside, then crack it against hard coral to eat the soft parts inside.

- Wrasses **use the coral reef** both as a tool to flip the urchin and to crack it open for food.

➢ **Importance of the Findings:**

○ Scientists have only observed anvil use in about **18 fish species worldwide,** all from the **Labridae family.**

- The recently discovered **three tool-using species also belong to the same family.**

○ These fish **prey on invertebrates** such as crabs, clams, and urchins and vertebrates like baby sea **turtles**, but their sizes, approaches, prey handling, and locations differ.

Which Other Marine Species Use Tools?

➢ **Octopuses:** These **cephalopods** are known for their **exceptional problem-solving skills** and tool use.

○ They have been observed using **coconut shells** and other objects for shelter, dragging around discarded shells for protection, and even dismantling and reassembling equipment in aquariums.

➢ **Dolphins:** Some **dolphin species** use marine sponges to protect their rostrums (snouts) while foraging on the seafloor.

○ This behavior, known as **"sponging,"** is a form of tool use unique to certain populations of dolphins.

➢ **Sea Otters:** These mammals are known to use rocks and other hard objects as tools to break open shellfish, such as clams, for food.

○ They typically place the rock on their chests and use it to smash the shell against, **known as an anvil technique.**

➢ **Fish:** The blackspot **tuskfish**, found in coral reefs, demonstrates learning and adaptability by using rocks to open clamshells, **similar to how archer fish use water jets to shoot down prey above the surface.**

Threat of Invasive Alien Species

Why in News?

In recent years, the issue of **invasive alien species (IAS)** has gained increasing attention, particularly in regions

like the **Andaman and Nicobar Islands,** where the spread of species like the **chital** poses a significant threat to native flora and fauna.

What are Invasive Alien Species?

➤ **About:**

○ Invasive alien species (IAS) are **non-native organisms,** including plants, animals, pathogens, and others, introduced outside their natural habitat, **posing economic, environmental, and health risks.**

○ According to the **Convention on Biological Diversity (CBD),** IAS are characterised by their ability to **"arrive, survive, and thrive,"** outcompeting native species for resources.

○ In India, IAS are defined under the **Wildlife Protection Act, 1972 (amended in 2022),** as **non-native species posing a threat to wildlife or habitats.**

○ They adversely affect biodiversity by causing the **decline or elimination of native species** through **competition, predation, or transmission** of pathogens.

○ Invasive species disrupt local ecosystems and ecosystem functions, leading to ecological imbalance and loss of habitat.

○ Invasive species negatively affect livelihoods, particularly in developing countries, where agriculture, forestry, and fisheries are essential sources of income.

○ Invasive alien species are **one of the five major direct drivers of biodiversity loss globally,** alongside land and sea-use change, direct exploitation of organisms, climate change, and pollution.

➤ **Examples:**

○ Species such as **African catfish, Nile tilapia, red-bellied piranha, and alligator gar dominate** the list of invasive wildlife in India.

○ **Red-eared Slider,** a North American turtle, popular as a pet, has been introduced into Indian water bodies, outcompeting native species for food and habitat.

➤ **Impact on Native Flora and Fauna:**

○ 1 in 10 species on the IUCN Red List are threatened by invasive alien species.

○ Invasive species disrupt food chains and upset ecosystem balance, often dominating habitats devoid of natural competitors.

○ Since the 17th century, IAS has contributed to **nearly 40% of all known animal extinctions,** highlighting their significant role in biodiversity loss.

○ **Case Study:** In **Keoladeo National Park,** Rajasthan, African catfish prey on waterfowl and migratory birds, altering the park's ecological dynamics.

➤ **Amplified Damage:**

○ **Climate change,** pollution, habitat loss, and human-induced disturbances exacerbate the damage caused by IAS, compounding their adverse effects on ecosystems and human well-being.

● Biological invasions also put human health, food security and livelihoods at risk, as highlighted in the **United Nations Sustainable Development Goal 15.**

➤ **Economic Implications of IAS:**

○ The **Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES)** reported over 37,000 established alien species worldwide, with annual economic costs exceeding USD 423 billion.

○ A study published in the Journal of Applied Ecology states that the estimated **economic cost of biological invasions in India could reach up to USD 182.6 billion,** emphasising the far-reaching consequences for the economy and livelihoods.

○ **Case Example:** The **cotton mealybug**, an invasive species in India, has caused significant yield losses in cotton crops in the Deccan region.

Note:

SILENT INVADERS

The 11 high-concern invasive species have already attacked 66 per cent of India's natural systems. They are most prolific in fragmented and deciduous ecosystems and are least prevalent in areas with extreme climate and less anthropic pressure
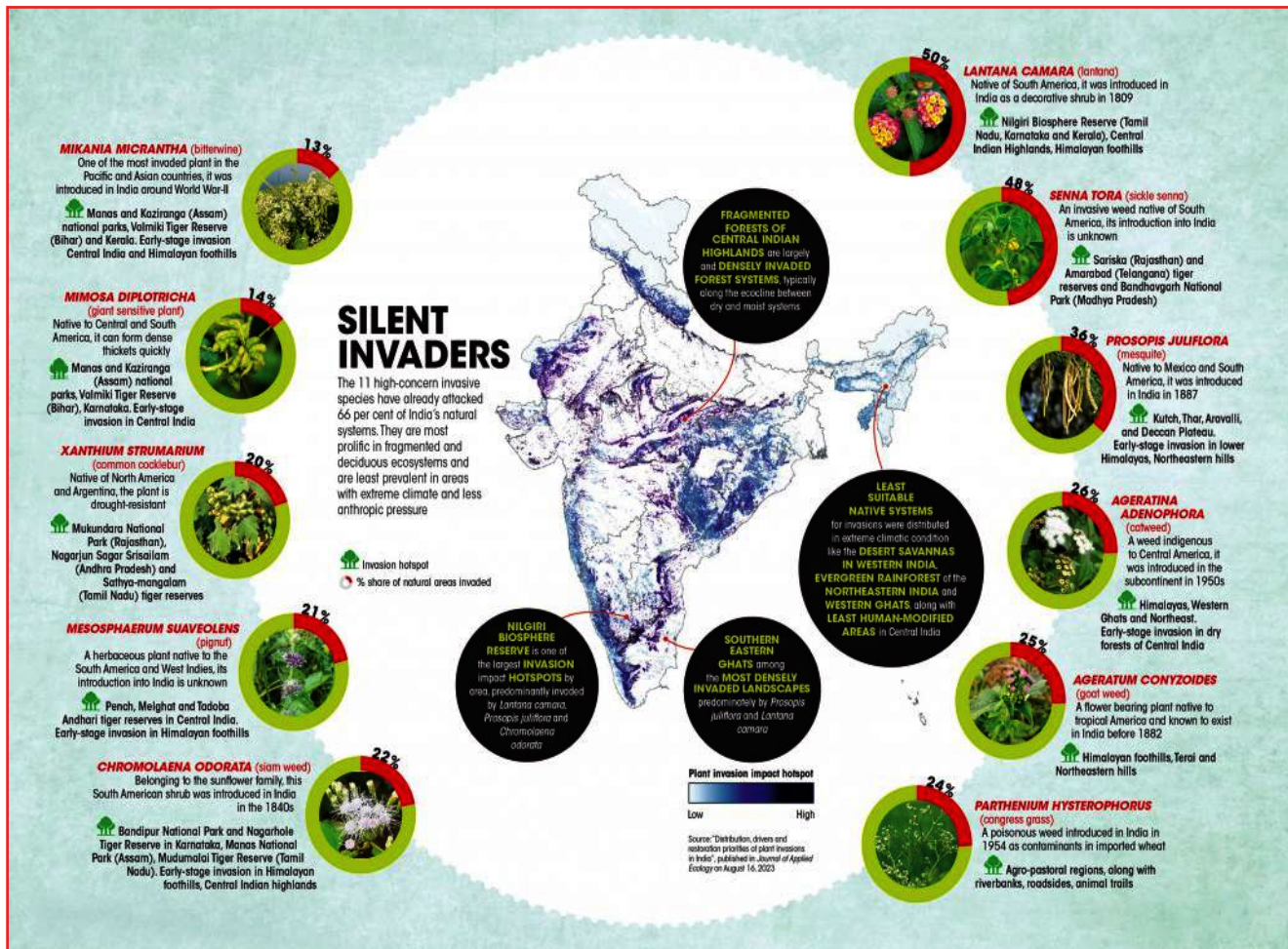
What are the Initiatives Related to the Management of Invasive Alien Species?

➢ **Global:**

  ❍ **Convention on Biological Diversity (CBD):**

   ● The **CBD and its Parties including India recognize the urgent need to address the impact of IAS**.

   ● Article 8(h) of the CBD states that **each Party should prevent the introduction of, control, or eradicate alien species** that threaten ecosystems, habitats, or species.

   ● The CBD sets global priorities, guidelines, collects information, and helps coordinate international action on invasive alien species.

  ❍ Kunming-Montreal Global Biodiversity Framework:

   ● Target 6 of the recently adopted **Kunming-Montreal Global Biodiversity Framework,** an international agreement under the UN-CBD, requires member states, including India, to reduce the impacts of **invasive alien species on biodiversity and ecosystem services by 50% by 2030.**

  ❍ IUCN Invasive Species Specialist Group (ISSG):

   ● Manages the **Global Invasive Species Database (GISD)** and the Global Register of Introduced and Invasive Alien Species.

   ● Provides information on invasive species across taxonomic groups to support management efforts.

Note:

- **India:**
  - ○ National Biodiversity Action Plan:
    - Target 4 is specifically focused on the prevention and management of invasive species.
  - ○ National Action Plan on Invasive Alien Species (NAPINVAS):
    - Launched by the Ministry of Environment, Forest and Climate Change (MoEFCC), NAPINVAS focuses on preventing new introductions, early detection, control, and management of established IAS.
  - ○ National Invasive Species Information Center (NISIC):
    - This centre provides information and resources on invasive species in India, raising awareness about the issue.
  - ○ Plant Quarantine (Regulation of Import into India) Order, 2003:
    - Under the Department of Agriculture and Cooperation (DAC) it regulates the import of plants and plant material to prevent the introduction of IAS.

Term	Definition
Alien Species	A species, subspecies, or lower taxon introduced outside its natural past or present distribution, including any part, gametes, seeds, eggs, or propagules.
Invasive Alien Species	An alien species whose introduction and/or spread threatens the biological diversity of the region/habitat.
Naturalised Species	Alien species that sustain self-replacing populations for several life cycles or a given period without direct intervention by people or despite human intervention.

■■■

Note:

drishti

Security

Highlights

- Left Wing Extremism
- Israel's Air Defence System
- Strategic Importance of A&N Islands

Left Wing Extremism

Why in News?

Recently, two different incidents of naxalites attack were reported from Chhattisgarh and Assam.

➢ **29 Naxalites** were killed in the Kanker area of Chattisgarh in one of the largest operations by security forces in Chhattisgarh.

➢ In another incident, **three vehicles of the paramilitary Assam Rifles were ambushed** in eastern Assam's Tinsukia district.

What is Naxalism?

➢ **Origin:**
  ○ The term **Naxalism** derives its name from the village Naxalbari of West Bengal.
  ○ It originated as rebellion against local landlords who bashed a peasant over a land dispute.
  ○ The movement soon spread across Eastern India in less developed areas of states such as Chhattisgarh, Odisha and Andhra Pradesh.
  ○ **Left-wing extremists (LWE)** are popularly known as Maoists worldwide and as **Naxalites** in India.

➢ **Objective:**
  ○ They advocate for the overthrow of the Indian government through **armed revolution** and the establishment of a **communist state** based on **Maoist principles.**
  ○ They view the state as **oppressive, exploitative,** and serving the interests of the ruling elite, and seek to address socio-economic grievances through armed struggle and people's war.

➢ **Modus Operandi:**
  ○ Naxalite groups engage in a range of activities, including guerrilla warfare, attacks on security forces, extortion, intimidation, and propaganda.
  ○ They try to **capture State power** through a combination of armed insurgency, mass mobilisation and strategic alliances.
  ○ They **target government institutions, infrastructure,** and economic interests, as well as perceived collaborators and informants.
  ○ Naxalites also **operate parallel governance structures** in certain areas under their control, providing basic services and dispensing justice.

➢ **Status of LWE in India:**
  ○ The year 2022 witnessed the **lowest number of incidents** of violence and deaths in Naxal-hit areas in the last four decades.
  ○ Violent incidents in Naxalism-affected States have come down by **77%** in 2022 compared to the high of 2010.
    ● The number of districts affected dropped from 90 to 45.
  ○ The number of **deaths of security forces and civilians** in LWE violence has also **reduced by 90% in 2022** compared to the high of 2010 (98 in 2022 from 1005 in 2010).

➢ **States Affected by LWE:**
  ○ The States of Chhattisgarh, Jharkhand, Odisha, Bihar, West Bengal, Andhra Pradesh, Telangana, Maharashtra, Madhya Pradesh and Kerala are considered LWE affected.
  ○ The **Red Corridor is the region** in the central, eastern and southern parts of India that **experience severe Naxalism–Maoist insurgency.**

Note:

A map of India's Maoist conflict

A crackdown on Maoist rebels has led to a rise in the number of casualties in the country's tribal areas. Here are the regions that are most affected.

Legend:
- Highly affected
- Moderately affected
- Marginally affected
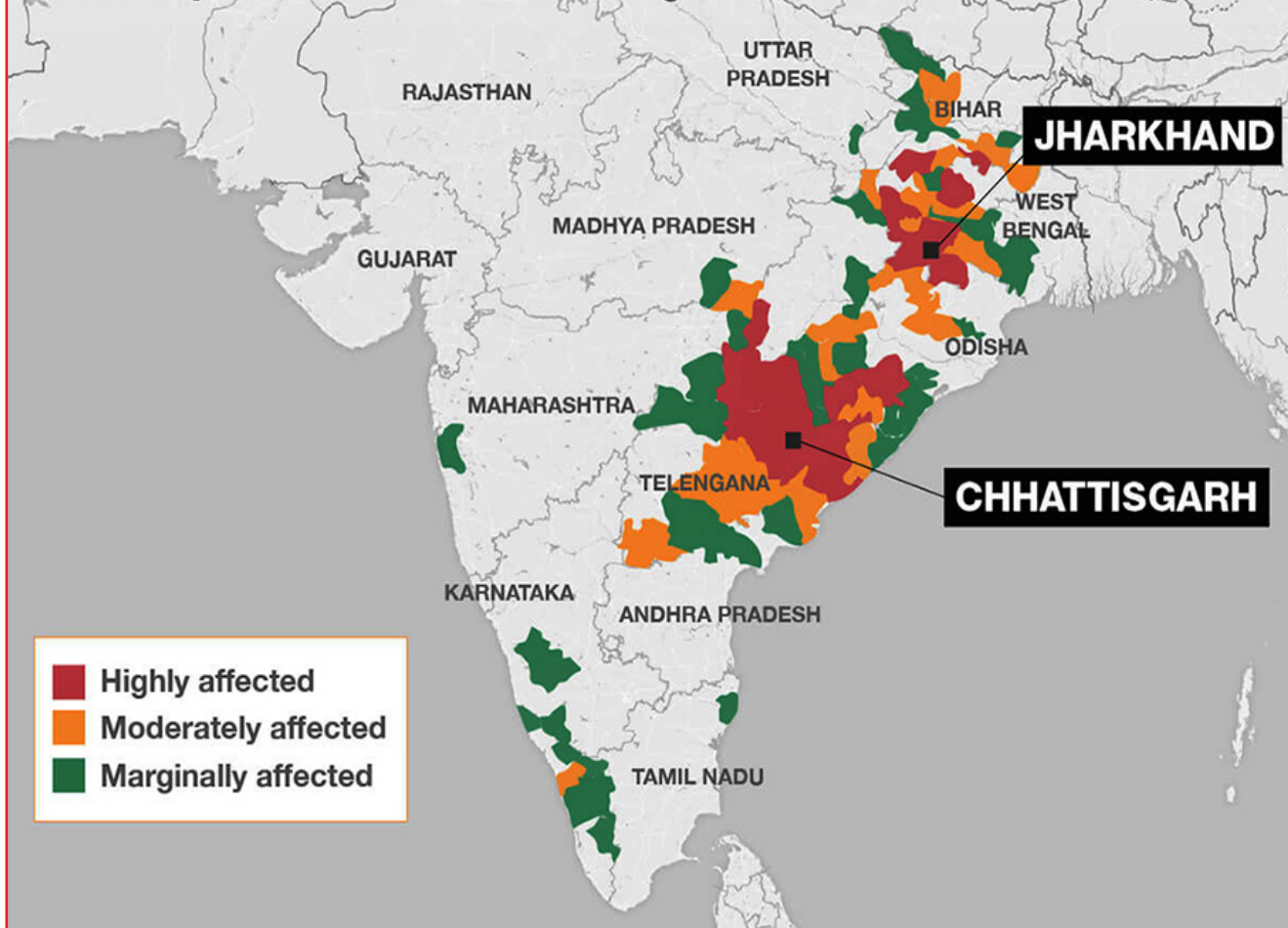
What are the Causes for Naxalism?

➢ **Socio-Economic Factors:**
  ○ **Poverty and Lack of Development:** Naxalism thrives in **underdeveloped regions** with high poverty rates.
    ● Adivasi (indigenous) and Dalit (lower caste) communities often face social exclusion and lack access to basic necessities like healthcare and education.
    ● This fuels resentment and makes them receptive to Naxalite ideology.
  ○ **Land Rights Disputes:**
    ● Adivasis have been displaced from their traditional lands due to mining and development projects, creating anger and a sense of injustice.
    ● **Naxalites** exploit these disputes to project themselves as champions of the marginalised.
  ○ **Exploitation by Powerful Entities:**
    ● Tribal communities are particularly vulnerable to exploitation by landlords, moneylenders, and mining companies.

Note:

- Naxalites position themselves as protectors against such exploitation.
  ○ **Caste Discrimination:** Dalits, who face social and economic marginalisation, may find Naxalism appealing as it challenges the existing caste hierarchy.
- ➤ **Political Factors:**
  ○ **Weak Governance and Lack of Infrastructure:** Naxalism flourishes in areas with a weak government presence.
    - **Poor infrastructure** like roads and communication networks allows Naxalites to operate with less interference.
    - **No Follow-Up from Administration**: It is seen that even after police take hold of a region, administration fails to provide essential services to the people of that region.
    - **Lack of Coordination between Centre and State Government**: State governments consider naxalism as the central government's issue and thus are not taking any initiatives to fight it.
  ○ **Disillusionment with Democracy:** Naxalites feel that the democratic system has failed to address their needs and grievances.
    - Naxalites offer an alternative, albeit violent, path to change.
- ➤ **Additional factors:**
  ○ **Globalization:** Discontent with the impact of globalisation, particularly **displacement due to land acquisition for corporations,** can contribute to Naxalite support.
  ○ **Confusion** over tackling naxalism as a social issue or as a security threat.
  ○ **Wide Geographic Spread:** **LWE** groups operate in remote and inaccessible areas; dense forests, hilly terrains, and where there is lack of proper infrastructure making it challenging for security forces to track them down.

What are Initiative of Government Against Naxalism?

- ➤ **National Policy and Action Plan to address Left Wing Extremism 2015**
- ➤ **SAMADHAN**
- ➤ **Aspirational Districts Programme**
- ➤ **Security Related Expenditure (SRE) Scheme:** Scheme implemented in 10 LWE affected States for Security Related Expenditure.

○ It relates to training and operational needs of security forces, ex-gratia payment to the family of civilians/security forces killed/injured in LWE violence, rehabilitation of surrendered LWE cadres, community policing, village defence committees and publicity materials.
- ➤ **Special Central Assistance (SCA) for most LWE Affected Districts:** It aims to fill the critical gaps in **Public Infrastructure and Services**, which are of emergent nature.
- ➤ **Scheme of Fortified Police stations:** Under the scheme, 604 fortified police stations have been constructed in LWE affected areas.
- ➤ **Road Connectivity Project for LWE Affected Areas (RCPLWE):** It aims at improving road connectivity in LWE affected States.

Israel's Air Defence System

Why in News?

○ Recently, Israel's multi-layered air defence system defended the country from a major attack, as Iran launched over 300 armed drones and long-range missiles.

What are the Key Facts About Israel's Air Defense System?

- ➤ **Air defence systems** are basically shields against threats from the sky. They are a combination of different technologies that work together to **spot, track, and destroy** incoming aircraft, missiles, or drones.
  ○ Israel's air defense system consists of **Iron Dome** and **C-Dome**.
- ➤ **Iron Dome:**
  ○ It is a **short-range, ground-to-air, air defence system of Israel**.
  ○ The Iron Dome has **three main systems** that work together to provide a shield over the area where it is deployed.
    - **Radar:** It has a detection and tracking radar to spot any incoming threats.
    - **Weapon Control**: It has a **battle management and weapon control system (BMC).**
    - **Missile Fire:** It also has a missile firing unit. The BMC basically liaises between the radar and the interceptor missile.

- ○ It is **used for countering rockets, artillery & mortars** as well as aircraft, helicopters and **Unmanned Aerial Vehicles (UAV).**
- ○ It is capable of being used in **all weather conditions**, including during the day and night. It **claims a success rate of over 90%**.
- ○ It **can protect deployed and manoeuvring forces**, as well as the forward operating base (FOB) and urban areas, against a wide range of indirect and aerial threats.

ISRAEL'S IRON DOME DEFENCE SYSTEM
Mobile system to intercept rockets with range of 4-70km

Incoming rocket
- Short range rocket
- 155mm shells
- Short range up to 70km

Launcher
- Each has 20 interceptor missiles with an in-built radar seeker

Multi-mission radar
- Identifies rocket or shell
- Monitors trajectory

Mobile control unit
- Analyses trajectory
- Estimates impact point
- Commands launch or interceptor missile

Tamir interceptor
Length: 3m
Weight: 90kg

➤ **C-Dome:**
- ○ It is a **naval version** of **Israel's Iron Dome** air defence system, used to shield against rocket and missile attacks.
- ○ It was **first unveiled** in **2014** and declared operational in November 2022.
- ○ It works similarly to the Iron Dome, except that it is mounted on ships.
- ○ It is **mounted on Sa'ar 6-class corvettes**, **and German-made warships**, and uses the **same interceptor** as the Iron Dome.
- ○ Unlike the Iron Dome, which has its dedicated radar, the C-Dome is integrated into the ship's radar to detect incoming targets.
- ○ It ensures **full-circular vessel protection** and **high kill probability** against a full spectrum of modern threats—maritime and coastal.

Similar Air Defense System of India

➤ **Indrajaal:**
- ○ **India's first indigenous drone defence dome** called **"Indrajaal"** was designed and developed by **Hyderabad-based technology R&D firm Grene Robotics.**
- ○ It has the capability to **autonomously protect an area of 1000-2000 sq km** against the aerial threats by assessing and acting on aerial threats such as Unmanned Aerial Vehicles (UAVs), loitering munitions, and Low- Radar Cross Section (RCS) targets.
- ○ It will not only provide protection to defence bases but it will be **beneficial for linear infrastructures like international borders** against advanced weaponry.

➤ **S-400 Triumf Missile System**:
- ○ The **S-400 Triumf** is a **mobile, surface-to-air missile system (SAM)** designed by **Russia.** It is one of the most dangerous operationally deployed **modern long-range SAM (MLR SAM)** in the world, considered much ahead of the **US-developed Terminal High Altitude Area Defense System (THAAD).**
- ○ The system can **engage all types of aerial targets** including aircraft, unmanned aerial vehicles (UAV) and ballistic and cruise missiles **within a range of 400km, at an altitude of up to 30km.**
- ○ The system **can track 100 airborne targets** and engage six of them simultaneously.

Strategic Importance of A&N Islands

Why in News?

The Indian government's renewed focus on developing the **Andaman and Nicobar Islands(ANI)** underscores their strategic significance in the **Indo-Pacific region**, prompting efforts to enhance infrastructure and security.

➤ The recent focus on building strategic infrastructure on the islands, both civilian and military, is long overdue and reflects a lack of strategic maritime vision since Independence.

Note:

What is the Strategic Importance of the Andaman and Nicobar Islands?

➢ Located 700 nautical miles southeast of the Indian mainland, the Andaman and Nicobar **Islands add 300,000 sq km to India's exclusive economic zone,** with the potential for **undersea hydrocarbon and mineral deposits.**

➢ The islands' strategic location astride the **Malacca Strait,** makes them a crucial asset for **India's ability to monitor and project power in the Indo-Pacific region.**

  ○ The Malacca Strait is a critical maritime choke point, with more than 90,000 merchant ships carrying about **30% of the world's traded goods passing through it annually.**

➢ The islands share maritime boundaries with Myanmar, Thailand, Indonesia, and Bangladesh, giving India substantial ocean space under the **United Nations Convention on the Law of the Sea (UNCLOS) in terms of exclusive economic zone and continental shelf.**

➢ The islands can serve as the **first line of defence against any attempt from the East** to undermine India's maritime security, especially in the face of China's growing influence in the Indo-Pacific region.

➢ **Port Blair** can become a regional hub for navies to collaborate on disaster relief, medical aid, counter-piracy, search and rescue, and other maritime security initiatives.

What are the Challenges to the Development of the ANI?

➢ The shift from **India's Look East policy to a stronger Act East policy,** along with the growing recognition of the significance of maritime power and the increasing capabilities of the Chinese PLA Navy, has underscored the need to develop Indian island territories, especially the Andaman and Nicobar group.

➢ **Lack of political prioritisation** until recently, with the realisation of the islands' strategic importance only now.

➢ Challenges of **distance from the mainland and difficulties in developing infrastructure.**

➢ Complex **environmental clearance procedures** and regulations on forest and tribal conservation.

  ○ Coordination challenges due to the involvement of multiple ministries and agencies. The conflict between long-term strategic vision and immediate political gains.

What Strategic Infrastructure Development is Needed in A&N Islands?

➢ **Enhancing Maritime Domain Awareness:**

  ○ Ensuring comprehensive maritime domain awareness and surveillance over the islands.

  ○ Bolstering deterrence capabilities against any naval misadventures from the East.

➢ **Bolstering Infrastructure:**

  ○ Developing infrastructure to support **India's maritime economy, especially in the southern group of islands.**

    • Improving transportation and connectivity to facilitate development and tourism. Developing **Galathea Bay transhipment port** on Great Nicobar Island.

    • The plan to connect the A&N Islands to the mainland through **Submarine Optical Fibre Cable (OFC)** needs revitalisation. This will provide cheaper and better connectivity and access to **Digital India's benefits.**

  ○ Reducing the **islands' dependence on mainland support for essential supplies** and services.

  ○ Enhancing transportation and connectivity for development and tourism.

  ○ Establishing high-speed inter-island ferry services and a seaplane terminal.

➢ **Enhancing Military Presence:**

  ○ The **military must increase forces and deploy** the appropriate assets at the **Andaman Nicobar Command (ANC)** to maintain island security. This includes basing surveillance and fighter aircraft there, as well as conducting frequent detachments.

➢ **International Collaborations:**

  ○ Exploring partnerships with the **Quad and Indo-Pacific Oceans Initiative (IPOI)** for development initiatives.

  ○ Seeking infrastructure development concessions akin to those on India's northern borders.

Note:

Andaman and Nicobar Islands

➢ **History:**

○ India's association with Andaman and Nicobar Island dates back to the aftermath of the **1857 War of Independence** when the British established a **penal colony for Indian revolutionaries**.

○ The **islands** were occupied by the Japanese in 1942 and later became the **first part of India to be liberated from British rule** in 1943 when **Netaji Subhas Chandra Bose** visited Port Blair.

○ After the Japanese surrender in 1945, the British reoccupied the islands. On the eve of Independence islands were given to India.

○ The **period from Independence until 1962 saw neglect of the islands** due to their remote location and dark symbolism.

○ In 1962, a naval garrison was established due to concerns about a Chinese submarine. In 2001, the **Andaman Nicobar Command (ANC)** was established in Port Blair after the post-Kargil War security review, marking India's first joint and **Unified operational command.**

● The ANC, established in 2001, is India's first joint/unified operational command, placing forces from **all three services and the Coast Guard** under a single commander-in-chief.

● The ANC is responsible for maintaining comprehensive maritime domain awareness and deterrence capabilities in the strategic Andaman and Nicobar archipelago.

➢ **Key Facts:**

○ The **Ten Degree Channel** is a narrow strait that separates the Andaman Islands from the Nicobar Islands. It is located approximately at the 10-degree latitude mark.

○ **Indira Point** is the southernmost tip of the Nicobar Islands. It is situated on Great Nicobar Island and marks the southernmost point of India.

○ The ANI is home to 5 **Particularly Vulnerable Tribal Groups:**Great Andamanese, Jarwas, Onges, Shompens and North Sentinelese.

➢ **Recent Development:**

○ NITI Aayog is undertaking a **project for Great Nicobar** which will include an **international container transhipment terminal, an airport, a power plant, and a township.**

○ Additionally, a proposal for **Little Andaman** calls for the development of a new greenfield coastal city to compete with Singapore and Hong Kong.

○ The **Kra Canal is a proposed canal in Thailand** that would connect the Gulf of Thailand with the Andaman Sea. It aims to create a shortcut for shipping between the Indian Ocean and the South China Sea.

■■■
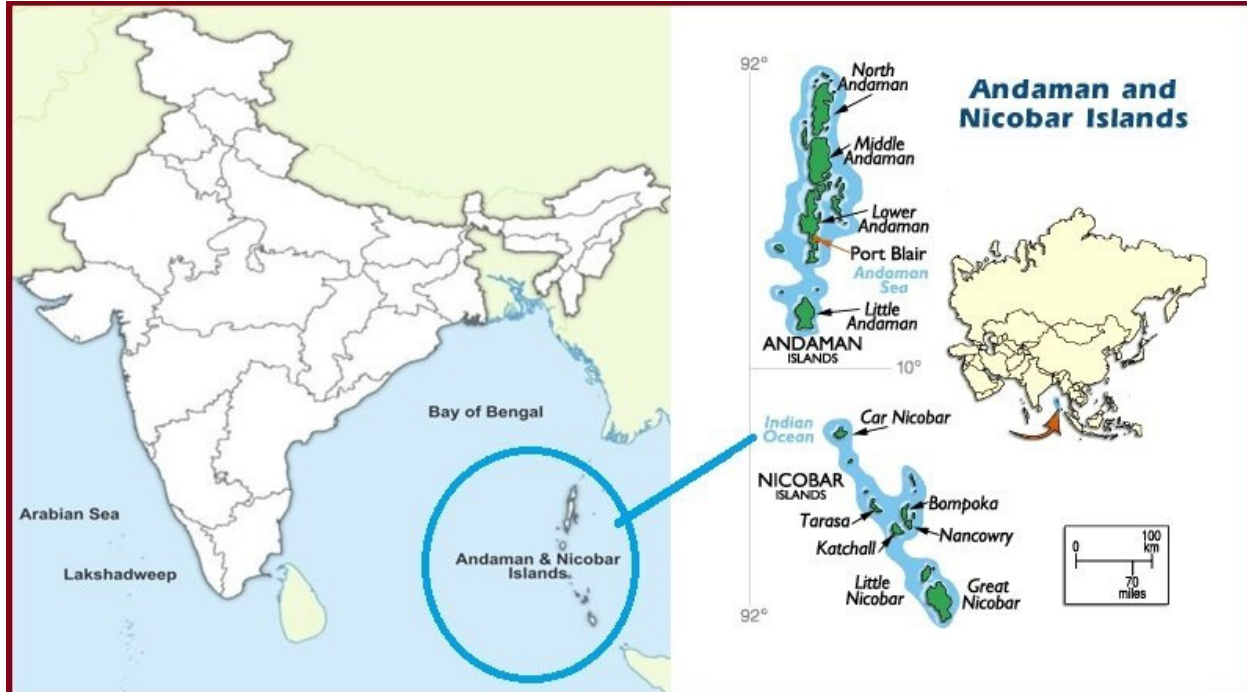
Note:

Art and Culture

Highlights

- *Kashmir's Magic Carpet*

Kashmir's Magic Carpet

Why in News?

Recently, the famous **Hazratbal Dargah** in **Srinagar** is attracting locals for a rare spectacle of the washing and clipping of the **largest carpet** woven in Kashmir so far.

What is Kashmir's Magic Carpet?

➢ **About:**
  ○ **Kashmir's magic carpet made in Kashan Style is an intricate marvel**, 72 feet in length and 40 feet in width, weighing 1,685 kg, and **featuring over three crore knots.**
  ○ It has taken **eight years** to weave, with artisans returning to the traditional trade and overcoming several challenges including the 2014 floods, the **abrogation of Article 370 in Jammu and Kashmir** in 2019, and the waves of the **Covid-19** pandemic.
    ● At least 30 people are required to unroll this mammoth carpet.
    ● A dedicated team of 30-35 professional washers diligently tends to it on a daily basis.
    ● It is likely to embellish a palace in the **Middle East.**
  ○ Kashmiri artisans are competing for the first time against their long-standing **Iranian competitor**, who have crafted a carpet the size of a soccer field at 60,468 square feet.

➢ **Kashan Style:**
  ○ The carpet follows the **Kashan style**, a historic design borrowed from the **Iranian city of Kashan.**
  ○ The **Kashan style of ceramic art,** originating from the historic city of **Kashan in Persia** (modern-day Iran), has captivated art enthusiasts for centuries.
  ○ Known for its **exquisite execution** and **intricate patterns**, Kashan ware represents a harmonious blend of tradition, innovation, and artistic finesse.

➢ **Historical Context:**

➢ **Legacy of Zain-ul-Abidin:** The carpet craft traces its roots back to the **15th century when Badshah Zain-ul-Abidin** invited artisans from Persia and Central Asia to settle in Kashmir.

➢ **From Shawls to Carpets:** Initially, the focus was on weaving exquisite **pashmina shawls.** However, with the decline of demand due to **jacquard looms in Europe**, artisans shifted their skills to **carpet weaving.**

➢ **British Recognition:** Kashmiri carpets gained global acclaim after being exhibited at the Great London Exhibition of 1851.

➢ **Prizes and Distinction:** These carpets continued to shine at exhibitions in Chicago, Paris, and London during the late 19th and early 20th centuries.

➢ **Weaving Secrets:** The secret blueprints, known as **talim**, guide artisans across generations, preserving the ancient techniques.

Government Initiatives for Empowering Kashmir's Carpet Weavers:

➢ **Revival of Namda Craft under PMKVY 3.0:**

  ○ **Objective:** The **Ministry of Skill Development and Entrepreneurship (MSDE)** launched a special pilot project under the **Pradhan Mantri Kaushal Vikas Yojana (PMKVY)** to revive the traditional **Namda craft of Kashmir.**

  ○ **Namda Craft: Namda** is a unique **rug made of sheep wool using the felting technique** instead of the normal weaving process.

➢ **Recognition of Prior Learning (RPL) for Artisans and Weavers:**

  ○ The **RPL** component of PMKVY focuses on upskilling artisans and weavers.

  ○ The initiative aims to upskill 10,900 artisans and weavers in Jammu and Kashmir.

  ○ By enhancing productivity through RPL assessment and certification, the project ensures the continuation of Kashmir's weaving legacy.

➢ **Geographical Indication (GI) Tag for Kashmiri Carpets:**

  ○ **GI Registry:** The Jammu and Kashmir government initiated a Geographical Indication (GI) registry for the **famed Kashmiri carpet.**

  ○ **QR Code:** Each **GI-tagged** carpet now comes with a **quick response (QR) code**, providing details of artisans and materials used.

  ○ **Export:** The first consignment of GI-tagged carpets was exported to Germany, marking a significant step in safeguarding this craft.

Note:

History

Highlights

- *Ikshvaku Period Coins Found in Telangana*
- *Mahavir Jayanti*
- *NCERT Recent Revisions in School Textbooks*
- *Story of Usha Mehta and Congress Radio*

Ikshvaku Period Coins Found in Telangana

Why in News?

Recently, Telangana's **Department of Heritage** discovered a hoard of 3,730 **lead coins** in an earthen pot at **Phanigiri**, a renowned **Buddhist heritage site** located 110 km away from Hyderabad.

What are the Findings of the Excavation?

➤ **Recent Excavation:**

○ A **globular pot** measuring 16.7 cm in diameter and 15 cm in height was **unearthed** at a depth of 40 cm from the ground level in the **Southernmost monastic cell.**

○ The pot's mouth was covered with a shallow pot on the outside and a broken bowl base on the inside and contained 3730 coins weighing an average of 2.3 grams each.

○ Archaeologists conclude that all coins, similar in appearance and made of lead, featuring an **elephant symbol** on the **obverse and Ujjain symbol** on the **reverse**, belong to the **Ikshvaku period** (3rd-4th century CE) based on **strata graphical** and **typological studies**.

○ **Other Artefacts Found:**

- Many other valuable cultural antiquities and structural remains, including **beads of stone and glass,** shell bangle fragments, **stucco motifs,** broken **limestone sculptures, toy cartwheels,** iron nails, and **pottery**, were also unearthed during the excavation.

➤ **Earlier Excavation:**

○ At **Phanigiri**, the earlier excavations were carried out for **seven field seasons**.

- These excavations at **Phanigiri** brought to light a **Mahastupa**, apsidal **Chaitya Grihas**, Votive stupas, pillared congregation halls, **Viharas**, platforms with staircases at various levels, octagonal stupa chaitya.

- A **24-pillared mandapa**, a circular chaitya, and cultural materials including **terracotta beads**, semi-precious beads, iron objects, shell bangle pieces, **coins**, stucco figures, **Brahmi label inscriptions,** and a **holy relic casket** were also found.

➤ **Significance of Phanigiri Village:**

○ **Phanigiri village** lies on the left bank of the **Bikkeru Rivulet**, a tributary of the **river Musi** in Hyderabad.

○ It is one of the **important Buddhist monasteries** strategically located on the hilltop, on the **ancient trade route (Dakshinapatha)** connecting north to south.

○ Etymologically, the village Phanigiri has derived its name from the shape of a hillock located on the northern side of the village, which is like a **snake hood.**

- In Sanskrit, Phani means snake and Giri means hillock.

○ This village was occupied by pre/proto-historic, early historic, early medieval, and **Asaf Jahi period (1724-1948)** inhabitants.

Note:

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○ This village had a vibrant life from 1000 BCE to late 18th century CE.

○ This evolved Buddhist monastery **surpasses** the monasteries at **Amaravathi** and **Vijayapuri (Nagarjunakonda)** in Andhra Pradesh.

○ The early historic site at Phanigiri was **first discovered** and protected during the **period of Nizam** and was excavated from 1941 to 1944 by **Sri Khaja Mahamad Ahmad.**

➤ **Other Buddhist Sites in the Region:**

○ There are several Buddhist sites near Phanigiri, such as **Vardhamanukota, Gajula Banda, Tirumalagiri**, Nagaram, Singaram, Aravapalli, Ayyavaripalli, Arlagaddagudem and Yeleswaram.

Stratigraphical and Typological Studies of Coins

These are methods used in numismatics (the study of coins) to understand the chronological and cultural context of coins.

➤ **Stratigraphical Studies:**

○ This method involves studying the **layer or strata** in which **coins are found** during archaeological excavations.

○ By analysing the stratigraphy, researchers can determine the **relative age of coins** compared to other artefacts found in the same layer.

○ This helps **establish a chronological sequence** of coinage and understand the history of a site.

➤ **Typological Studies:**

○ Typology is the **classification of coins** based on their **physical characteristics**, such as design, metal composition, size, and inscriptions.

○ By comparing these features, numismatists can group coins into **types and subtypes.**

○ Typological studies help in **identifying the origin,** minting authority, and period of circulation of coins.

What are the Key Facts About the Ikshvaku Period?

➤ **About:**

○ The **Ikshvakus** emerged in the **Krishna-Guntur region** following the decline of **Satavahana power** in the **eastern part** of the peninsula.

● The **Ikshvaku dynasty (300 CE- 400 CE)**, is named after the legendary **King Ikshvaku.**

○ Knowledge of the Ikshvakus comes primarily from **inscriptions, coinage**, and **archaeological excavations.**

○ Evidence suggests that the dynasty emerged in the **Vijayapuri region** (modern Bellary district, Karnataka) around the 3rd century CE.

● The Ikshvakus were succeeded by **Pallavas.**

➤ **Expansion and Consolidation:**

○ The Ikshvakus rose to prominence under **King Kanha**, who significantly expanded their territory.

○ Kanha's conquests encompassed parts of Andhra Pradesh, Telangana, and Maharashtra, establishing a **formidable regional power.**

➤ **Cultural and Economic Contributions:**

○ The dynasty actively **patronised Buddhism**, leading to the construction of magnificent **stupas** and **monasteries**, like those at **Kanaganahalli and Sankaram.**

○ **Ikshvaku coins,** featuring Buddhist symbols and regional deities, were **widely circulated** during this era.

Mahavir Jayanti

Why in News?

Recently, the **Prime Minister** of India inaugurated the **2550th Bhagwan Mahaveer Nirvan Mahotsav**, on the auspicious occasion of Mahaveer Jayanti.

➤ Jains celebrate **five Kalyanak's (major events) of every Tirthankar** including Mahavir Swami Ji: Chyavana/Garbha (Conception) Kalyanak; Janma (Birth) Kalyanak; Diksha (Renunciation) Kalyanak; Kevaljnana (Omniscience) Kalyanak and Nirvana (Liberation/Ultimate Salvation) Kalyanak.

➤ Prime Minister has also released a **commemorative stamp** and **coin** on the occasion.

What is Mahavir Jayanti?

➤ **About:**

○ **Mahavir Jayanti** is one of the most auspicious festivals in the **Jain community.**

○ This day marks the birth of **Vardhamana Mahavira**, who was the **24th** and the **last Tirthankara** who succeeded the 23rd Tirthankara, **Parshvanatha.**

Note:

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○ According to Jain texts, Lord Mahavira was born on the 13th day of the bright half of the moon in the **month of Chaitra.**
  ● As per the **Gregorian calendar**, Mahavir Jayanti is usually celebrated during the month of March or April.
○ A procession is called with the idol of Lord Mahavira called the Rath Yatra.
○ Reciting stavans or Jain prayers, statues of the lord are given a ceremonial bath called **abhisheka.**

➢ **Lord Mahavira:**
○ Bhagwan Mahavir Swami left an indelible mark on humanity through his profound **spiritual practices** and **teachings**.
○ Lord Mahavir was named **Vardhamana**, which means "one who grows".
○ During his **twelve-year period** of spiritual practices, Bhagwan Mahavir exhibited **four extraordinary qualities:**
  ● **Deep and Undisturbed Meditation:** His unwavering focus allowed him to attain profound insights.
  ● **Rigorous Penance:** He endured extreme physical hardships to purify his soul.
  ● **Tolerance of Pain:** Mahavir Swami demonstrated remarkable endurance.
  ● **Ultimate Equanimity:** His inner balance remained unshaken.
○ On the tenth day of the **Vaishakh**, Mahavir's journey reached a pivotal moment.
○ **Among the 5 teachings of Jainism the Brahmacharya (Celibacy/Chastity) was added by Mahavira.**

VARDHAMAN MAHAVIRA

The 24th and last Tirthankara; succeeded the 23rd Tirthankara, Parshvanatha
(Mahavira was not the founder of Jainism)

BIRTH

- To King Siddhartha of Kundalgram and Queen Trishala, a Lichchhavi princess
- In 6th century BC, Vajji kingdom (modern day Vaishali, Bihar)
- Belonged to Ikshvaku dynasty

Mahavir Jayanti, one of the most auspicious festivals for Jains, marks the birth of Vardhamana Mahavira

SPIRITUAL LIFE

- Abandoned worldly life at age 30
- Attained *'kaivalya'* (omniscience) at age 42
- Delivered his first sermon at Pava (near Patna)

A symbol is associated with every Tirthankara, Mahavira's symbol was a lion

DEATH

- Believed to be passed away and attained Moksha at age 72 (5th century BC)
- Died at Pavapuri (near modern-day Rajgir, Bihar)

Moksha - liberation from the cycle of birth and death

TITLES

- Mahavira (great hero)
- Jaina/Jitendriya (who conquered all his senses)
- Nirgrantha (who is free from all bonds)

TEACHINGS (JAIN AGAMAS)

- Ahimsa (non-violence)
- Satya (truth)
- Asteya (non-stealing)
- Aparigraha (non-attachment)
- Brahmacharya (chastity) (propounded by Mahavira)

Mahavira and his disciples taught in Prakrit to teach ordinary people

Drishti IAS

What is Jainism?

➤ The word **Jaina** comes from the term **Jina**, meaning conqueror.

➤ **Tirthankara** is a Sanskrit word meaning **'Ford maker'**, i.e., one who is able to ford the river, to cross beyond the perpetual flow of earthly life.

➤ Jainism attaches utmost importance to **ahimsa or non-violence.**

➤ It preaches **5 mahavratas (the 5 great vows):**
  ○ Ahimsa (Non-violence)
  ○ Satya (Truth)
  ○ Asteya or Acharya (Non-stealing)
  ○ Aparigraha (Non-attachment/Non-possession)
  ○ Brahmacharya (Celibacy/Chastity)

➤ Among these 5 teachings, the **Brahmacharya (Celibacy/Chastity) was added by Mahavira.**

➤ The **three jewels** or Triratna of Jainism include:
  ○ Samyak Darshana (right faith).
  ○ Samyak Gyana (right knowledge).
  ○ Samyak Charitra (right conduct).

➤ In later times, Jainism got divided into **two sects:**
  ○ **Shvetambaras** (white-clad) under Sthalabahu.
  ○ **Digambaras** (sky-clad) under the leadership of Bhadrabahu.

➤ The important idea in Jainism is that the **entire world is animated: even stones, rocks, and water have life.**

➤ Non-injury to living beings, especially to humans, animals, plants, and insects, is central to Jaina's philosophy.

➤ According to Jain's teachings, the **cycle of birth and rebirth is shaped through karma.**

➤ **Asceticism and penance** are required to free oneself from the cycle of karma and achieve the liberation of the soul.

➤ The practice of **Santhara** is also a part of Jainism.
  ○ It is the ritual of fasting unto death.**Swetambara** Jains call it **Santhara** whereas Digambars call it **Sallekhana**.
  ○ In the *Nikhil Soni vs Union Of India Case,* the **Rajasthan High Court** declared the Jain practice of Santhara as an offence punishable under the **Indian Penal Code (IPC)**. However, the matter is still *sub-judice* in Supreme Court.

NCERT Recent Revisions in School Textbooks

Why in News?

NCERT's latest textbook revisions include adding findings from **DNA analysis at Rakhigarhi,** emphasising ancient Indian continuity. Other major changes include highlighting **Ahom victories,** using honorifics for **Shivaji,** and rephrasing terms like "**rebel" to "revolt"** in historical contexts.

What are the Key Facts Related to Rakhigarhi?

➤ **Location:** Rakhigarhi is an archaeological site situated in the **Hisar district of Haryana** and is located in the **Ghaggar-Hakra** river plain.

➤ **Significance:** It is one of the **largest Indus Valley Civilization (IVC) sites** and is situated on the **banks of the now-dry Sarasvati River.**
  ○ Three layers of Early, Mature and Late phases of Indus Valley civilization have been found at Rakhigarhi.

➤ **Major Findings:** Drainage system, lanes, jewelry unit, copper and gold jewelry, terracotta toys, earthen pots, seals, a burnt-brick wall (possibility of a walled settlement), semi-precious stones such as **agate and carnelian**, two female skeletons buried with a plethora of pottery and adorned jewellery etc.
  ○ An important find from this site is a **cylindrical seal with 5 Harappan characters** on one side and a symbol of an alligator on the other.

➤ **DNA Analysis of Rakhigarhi:** It suggests a genetic continuity between the **Indus Valley Civilization (IVC)** inhabitants and modern populations, potentially challenging previous theories of large-scale migrations.
  ○ This finding adds weight to the argument for an indigenous origin of the IVC, a major civilization of the ancient world.

What is NCERT?

➤ **About**: The **National Council of Educational Research and Training (NCERT)** is an autonomous organisation set up in **1961** by the Government of India to assist and advise the **Central and State Governments** on policies and programmes for qualitative improvement in school education.

Note:

➢ **Objective**: NCERT and its units aim to conduct research in school education, create textbooks and educational materials, train teachers, promote innovative teaching methods, collaborate with educational entities, and work towards **Universal Elementary Education** goals.

➢ **NCERT and NEP 2020:** As per the **National Education Policy 2020**, NCERT is the nodal agency to develop **National Curriculum Frameworks (NCFs)** for: Early Childhood Care and Education (ECCE), School Education, and Adult Education.

➢ **Ahom Dynasty:**

○ The **Ahom dynasty (1228-1826 CE)** ruled over present-day Assam in northeastern India. They were known for their resistance against powerful empires.

○ **Battle of Saraighat**: It was a significant naval battle fought in 1671 between the **Ahom Kingdom and the Mughal Empire.**

● Ahom had a decisive Ahom victory against the Mughal Empire, halting Mughal expansion into Assam.

● This battle is considered a landmark in Ahom history.

➢ **Chhatrapati Shivaji Maharaj (1630-1680 CE):**

○ Shivaji established the **Maratha Empire**, a significant power in western India that challenged Mughal dominance.

○ He employed **innovative guerrilla warfare tactics**, using mobility and surprise attacks to his advantage against larger Mughal forces.

● He introduced the collection of two taxes called the **Chauth and Sardeshmukhi.** He also divided his kingdom into four provinces, each headed by a Mamlatdar.

● He abolished the **Jagirdari System** and replaced it with the Ryotwari System.

Story of Usha Mehta and Congress Radio

Why in News?

The recent release of a film depicting the life of freedom fighter **Usha Mehta** resurfaces the importance of her historical contribution and sacrifice during the **Quit India Movement.**

What was the Role of Usha Mehta in Quit India Movement (QIM)?

➢ **About QIM:**

○ Commencing on **8th August 1942**, marked by Mahatma Gandhi's iconic speech with **slogan Do or Die.** The QIM **symbolises mass civil disobedience, nationwide protests, and the establishment of parallel governance structures**.

○ British authorities responded with mass arrests, **detaining prominent leaders** including Gandhi, Nehru, and Patel, thereby drastically reducing the movement's intensity.

➢ **About Usha Mehta:**

○ Usha Mehta, then **a 22-year-old law student**, was galvanised by Gandhi's ideology, prompting her to forsake her studies and actively participate in the movement.

○ **Recognising the efficacy of propagating information**, Mehta conceived the notion of **Congress Radio as a secretive means of communication**.

➢ **Establishment of Congress Radio:**

○ Facing the **challenges of funding and technical expertise**, Mehta, alongside **associates such as Nariman Printer**, endeavoured to establish Congress Radio.

○ Despite regulatory restrictions imposed by British authorities, the Printer's adeptness facilitated the **creation of a functional transmitter**, enabling **Congress Radio's inaugural broadcast on 3rd September 1942**.

➢ **Catalysing Independence Through Broadcasts:**

○ **Congress Radio swiftly emerged as a preeminent source of news** for Indians, circumventing colonial censorship and disseminating crucial information regarding the movement's progress.

○ **Beyond news broadcasting, the station aired political speeches and ideological messages**, strengthening the people's dedication to gaining independence.

➢ **Legal Consequences and Mehta's Legacy:**

○ The secretive operations of Congress Radio ultimately **attracted the attention of British authorities, leading to the arrest and subsequent trial of Mehta and her associates**.

○ Mehta, revered as **"Radio-ben"** for her pioneering efforts, **continued to follow Gandhian principles post-independence**, garnering national recognition, including the **Padma Vibhushan in 1998**.

Note:

Mohandas Karamchand Gandhi

Drishti IAS

"The weak can never forgive. Forgiveness is the attribute of the strong."

Brief Description

Birth: 2nd October 1869, Porbandar (Gujarat).
2nd October is observed as **International Day of Non-Violence.**
Profile: Lawyer, Politician, Social activist, Writer and led Nationalist Movement.
Father of the Nation (first called by Netaji Subhash Chandra Bose).
Ideology: Believed in the ideas of non-violence, Truth, Honesty, Care for Mother Nature, Compassion, Welfare of Downtrodden etc.
Political Mentor: Gopal Krishna Gokhale
Death: Shot dead by Nathuram Godse (30th January, 1948).
30th January is observed as **Martyrs' Day**
Nominated for the Nobel Peace Prize five times.

Gandhi in South Africa (1893-1915)

Used satyagraha against racist regime (Native Africans and Indians were discriminated).
Pravasi Bharatiya Divas (PBD) is celebrated every year on 9th January, to commemorate his return from South Africa.

Contribution in India's Freedom Struggle

Small-scale movements like Champaran Satyagraha (1917)—First Civil Disobedience, Ahmedabad Mill Strike (1918)— First Hunger Strike, and Kheda Satyagraha (1918)—First Non-Cooperation.
Nationwide Mass Movements: Against Rowlatt Act (1919), Non-Cooperation Movement (1920-22), Civil Disobedience Movement (1930-34), Quit India Movement (1942).
Gandhi-Irwin Pact (1931): Between Gandhi and Lord Irwin that marked the end of a period of civil disobedience.
Poona Pact (1932): Between Gandhi and **B.R. Ambedkar;** this abandoned the idea of separate electorates for the depressed classes (Communal Award).

Books Written
Hind Swaraj, My Experiments with Truth (Autobiography)

Weeklies
Harijan, Navjivan, Young India, Indian Opinion.

Gandhi Peace Prize
is given by India for social, economic, and political transformation through Gandhian methods.

"Happiness is when what you think, what you say, and what you do are in harmony."

"You must not lose faith in humanity. Humanity is an ocean; if a few drops of the ocean are dirty, the ocean does not become dirty"

Read More:

Note:

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Geography

Highlights

- *Solar Radiation Decline in India*
- *Massive Floods in Dubai*
- *Marine Cloud Brightening*
- *India's New Post Office in Antarctica*
- *Volcanic Vortex Rings*
- *Drought in East Flowing Rivers*

Solar Radiation Decline in India

Why in News?

As concerns about **climate change** continue to escalate, the importance of **renewable energy** sources like **solar power** becomes increasingly evident.

➢ However, a recent study by scientists at the **India Meteorological Department (IMD)**has revealed a concerning trend about the **quantity of solar radiation** available for **conversion into electricity by solar panels** is on the decline in several locations across India.

What are the Key Highlights of the Study?

➢ **Aerosol Load:**
  - ❍ Increased **aerosol** load from **carbon emissions**, **fossil fuel burning**, **and dust, along** with **clouding,** contribute to the decline in solar radiation.
  - ❍ Aerosols absorb the sunlight and **deflect it away from the ground** and they can also precipitate the formation of **dense clouds that again block sunlight.**
  - ❍ The efficiency of solar panels is significantly influenced by the amount of sunlight incident on them.

Aerosol direct effect
Scattering and absorption
of solar radiation

Unperturbed cloud

Cloud with more aerosols

Aerosol indirect effect
Decrease of cloud droplet size, increase of droplet number,
increased scattering of solar radiation, decrease of precipitation
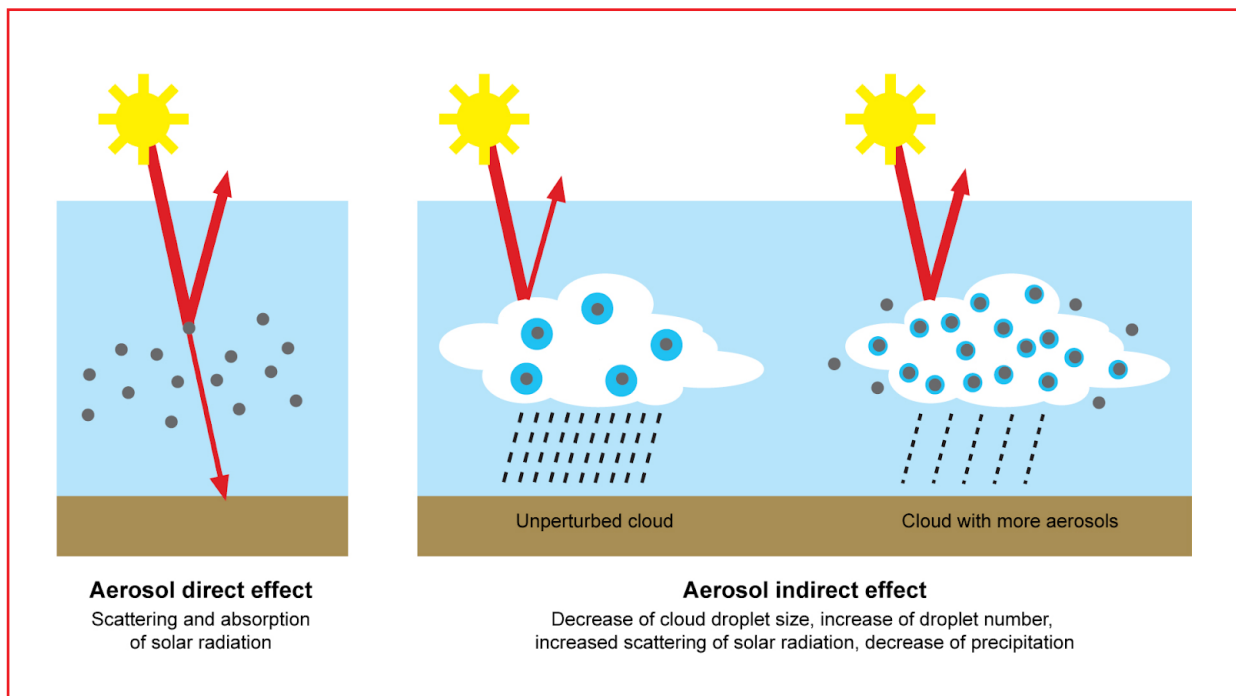
Note:

- ➢ **Decline in Solar Photovoltaic (SPV) Potential:**
  - ○ Analysis reveals a widespread decline in SPV potential across all monitored stations.
    - ● SPV is the amount of radiation that may be practically available to be converted to electricity by panels.
  - ○ SPV potential showed a **general decline in all stations** which included Ahmedabad, Chennai, Goa, Jodhpur, Kolkata, Mumbai, Nagpur, New Delhi, Pune, Shillong, Thiruvananthapuram, and Vishakhapatnam.
  - ○ **India's largest solar parks are located in the northwest,** particularly Gujarat and Rajasthan, and cities in both these States are also showing a decrease in SPV potential.
- ➢ **Global Solar Radiation (GR) over India:**
  - ○ Global solar radiation (GR) is the **total amount of solar radiation that is being received per unit area** on the earth's surface.
    - ● GR is **maximum over northwest India and inland peninsular India,** minimum over extreme north and northeast India.
    - ■ Reduction attributed to **increased atmospheric turbidity** and cloudiness. Monsoon clouds reduce the GR over most parts of India.
    - ● Maximum GR in pre-monsoon season for most stations, except Srinagar.
    - ● Minimum GR varies between monsoon, post-monsoon, or winter depending on the station.
- ➢ **Diffuse Radiation (DR):**
  - ○ Diffuse radiation refers to **solar radiation scattered by atmospheric particles.**
    - ● Clear skies transmit a large percentage of solar radiation, resulting in relatively small diffuse radiation.
    - ● In contrast, a partly cloudy or turbid atmosphere exhibits high diffuse radiation due to increased scattering of solar radiation by atmospheric particles.
  - ○ Significant increase in DR observed in more than 50% of stations, especially in northwest and some parts of peninsular India.
    - ● Increase attributed to increased atmospheric turbidity and cloudiness.

Key Terms	
Solar Radiation	➢ Solar radiation is **electromagnetic radiation** emitted by the sun that can be converted into useful forms of energy, such as **heat and electricity.** ➢ The amount of solar radiation that reaches a location on Earth's surface varies depending on **Geographic location, Time of day, Season, Local landscape, and Local weather.** ➢ The Earth's round shape causes the sun to strike its surface at different angles, ranging from **0° (just above the horizon) to 90° (directly overhead). Vertical 90° sun rays provide maximum energy,** while slanted rays travelling at 0-89° through the atmosphere become more scattered. ○ The **frigid polar regions never get a high 90° sun due to the Earth's round shape and 23.5° tilted axis**. ➢ The rotation of the Earth also causes hourly variations in sunlight.

Aerosol	➢ Aerosols are **tiny particles** that are suspended in a **gas or liquid environment.**
	  ○ They can be **solid or liquid** and range in size from a few tens of nanometers to several tens of micrometres about the diameter of human hair.
	
	➢ Aerosols can be **natural or artificial.**
	  ○ Natural aerosols include: fog, gas from **volcanic eruptions**, **sea salt** generated from breaking waves, and mineral dust blown from the surface by wind.
	  ○ Artificial aerosols consist of smoke from burning fossil fuels and various particles such as sulphates, nitrates, black carbon, and others emitted from automobiles, incinerators, smelters, and power plants.
	
	➢ Aerosols are **short-lived, unlike greenhouse gases** that persist and accumulate in the atmosphere for longer periods.

Note:

Note:

➢ In tropical countries like India, solar energy has immense potential. The energy of about **5,000 trillion kWh per year is incidental over India's land area.**

➢ IMD confirms the findings of the **IPCC AR6 (Intergovernmental Panel on Climate Change Assessment Report 6),** multidecadal dimming and brightening trends in incoming solar radiation at Earth's surface occurred at various locations all over the world.

What are the Implications for India's Solar Power Goals?

➢ **Current Scenario:**

○ India's current installed solar power capacity is about **81 GW (1 GW is 1,000 megawatts),** or roughly 17% of the total installed electricity.

○ **India stands 4ᵗʰ globally in Renewable Energy Installed Capacity**, 4ᵗʰ in Wind Power capacity and **5ᵗʰ in Solar Power capacity** (as per **International Renewable Energy Agency - Renewable capacity statistics 2023**).

➢ **Ambitious Targets:**

○ India has ambitious plans of sourcing about **500 GW, nearly half its requirement of electricity, from non-fossil fuel sources by 2030.**

● This would mean at least 280 GW of solar power by that year or **at least 40 GW of solar capacity being annually added until 2030.**

➢ **Challenges:**

○ Despite ambitious goals, the country has struggled to meet its targets, with annual additions barely crossing 13 GW in the last five years.

○ Factors like the **Covid-19 pandemic** have been cited as hindrances to progress and the country was on track to add between 25-40 GW annually in the coming years.

○ And other challenges for solar power development in India include **land acquisition complexities,grid integration issues,** slow growth of rooftop solar, **limited availability of storage technology,** and a need for more innovation.

Potential of Solar Advancements
➢ Beyond the economic and technological advancements, the environmental benefits of solar power advancements include: ○ **Mitigating Climate Change:** Solar panels significantly contribute to reducing climate change through their low ecological impact and **minimised carbon footprint.** ○ **Reduced Pollution:** Transitioning to cleaner energy sources reduces air and water pollution, promoting a healthier and sustainable environment. ○ **Securing the Planet's Future:** Solar power's environmental benefits go beyond progress, which is crucial in ensuring a sustainable future.

What are the Government Initiatives Related to Solar Energy?

➢ **The Production Linked Incentive Scheme (PLI) for the National Programme on High-Efficiency Solar PV Modules.**

➢ **Solar Park Scheme.**

➢ **PM-KUSUM.**

➢ **Rooftop Solar Programme.**

➢ **International Solar Alliance (ISA).**

Massive Floods in Dubai

Why in News?

Recently, one of the heaviest rainfall was recorded in the United Arab Emirates (UAE), after a severe **thunderstorm** hit the country. The storm had initially hit Oman before it landed in the UAE.

➢ On the other hand, Mumbai, lying on the other side of the **Arabian Sea**, has been undergoing a humid **heatwave** for the past few days, having a high relative humidity of 55%.

Note:

What is the reason for Mumbai's Hot Weather?

➢ The reason for Mumbai's hot weather is a huge **Anti-Cyclonic Effect** developed in the region.
   ○ **Anticyclones** are areas of **high atmospheric pressure**.
   ○ Winds in anticyclones move downward and compress, causing heating. They often lead to large-scale **heatwaves**.
   ○ Anticyclones can block other weather systems, causing extreme conditions around them.
➢ In Mumbai, the anticyclone caused a "**heat dome**" effect, warming the air further.
➢ Warm air from West Asia and the Arabian Sea was drawn in and heated by sinking motion. This increased humidity in Mumbai, **especially before the monsoon season.**
➢ Normally, **sea breezes cool Mumbai at night, but the anticyclone may have blocked them.** As a result, night temperatures were higher than usual.

What is the Climate of United Arab Emirates (UAE) and Rain Pattern?

➢ **About:**
   ○ UAE lies in the **arid regions** of the world, so such heavy rainfalls are **unusual** there.
   ○ On average, Dubai experiences **94.7 mm** of rain in a year. But this event was **historic** as it brought more than 142 mm of rainfall that had soaked Dubai over 24 hours.

➢ **Possible Causes of Extreme Rain**: The possible causes for such catastrophic event may be attributed to following reasons.
   ○ **Climate Change:**
      ● **Climate Change** along with multiple factors associated with it like patterns of **natural climate variability**, such as **El Niño** and **La Niña**, has contributed to the extreme rain.
      ● **Global warming:** It has led to higher temperatures causing evaporation of water not only from **land** but also **oceans and other water bodies**, causing a warmer **atmosphere to hold more moisture**.
         ■ For every **1 degree Celsius rise** in average temperature, the atmosphere can hold about **7%** more moisture.
         ■ This makes storms more dangerous as it leads to an increase in precipitation intensity, duration and/or frequency of storm.
   ○ Cloud Seeding:
      ● **Cloud seeding** is a process in which **chemicals** such as silver iodide crystals **are implanted into clouds** to increase rainfall in an environment where water scarcity is a concern.
      ● UAE, located in one of the hottest and driest regions on earth, has been leading the effort to seed clouds and increase precipitation.
   ○ Thunderstorm:
      ● **Thunderstorms** are generated by atmospheric imbalance and turbulence caused by a combination of several conditions, including unstable, warm air rising rapidly into the atmosphere; sufficient moisture to form clouds and rain; and upward lift of air currents caused by colliding weather fronts (cold and warm), sea breezes, or mountains.

Note:

Cloud Seeding

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Cloud seeding is the process of spreading either dry ice or more commonly, silver iodide aerosols, into the upper part of clouds to try to stimulate the precipitation process and form rain.

It uses planes to spray clouds with chemicals to condense smaller particles into larger rain droplets.

Cloud Seeding Methods:

Hygroscopic Cloud Seeding:
➤ Disperses salts through flares or explosives in the lower portions of clouds. The salt grows in size as water joins with them.

Static Cloud Seeding:
➤ It involves spreading a chemical like silver iodide into clouds. The silver iodide provides crystal around which moisture can condense. Silver iodide essentially makes rain clouds more effective at dispensing their water.

Dynamic Cloud Seeding:
➤ It aims to boost vertical air currents, which encourages more water to pass through the clouds, translating into more rain.

Applications:

Agriculture:
➤ It creates rain, providing relief to drought-stricken areas. 'Project Varshadhari' in Karnataka is an example.

Power Generation:
➤ Augment production of hydroelectricity during the last **40** years in Tasmania, Australia.

Water and Air Pollution Control:
➤ Settle down toxic air pollutants through the rain.

What are Thunderstorms?

➢ **About:**
- ❍ It is also known as an **electrical storm or a lightning storm**, is a storm in which lightning strikes and produces a tremendous audible effect in the Earth's atmosphere.
- ❍ It often occurs in **warm, humid environments** and can bring about intense rainfall, hail, and powerful winds. These storms usually develop in the afternoon or evening and can persist for a few minutes to several hours.

➢ **Formation:** There are 3 stages in the formation of a thunderstorm.
- ❍ Cumulus stage:
  - ● The ground is greatly heated due to solar insolation.

Note:

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- Due to the intense lifting of an air parcel, a low pressure begins to form (convention).
- Air from the surrounding area rushes in to fill the void created by the low pressure.
- A towering cumulonimbus cloud forms due to the intense convection of wet hot air.
- Mature Stage:
  - Characterised by a strong updraft of rising warm air that causes clouds to develop larger and rise higher. Later, a downdraft sends chilly air and rain to Earth.
  - A powerful blast of wind signals the arrival of a thunderstorm. This wind is caused by a strong downdraft.
  - The route of the thunderstorm is determined by the updraft and downdraft. The course is erratic the majority of the time.
- Dissipating Stage:
  - **Hails form when clouds reach heights where temperatures are below freezing,** and they fall as hailstorms. There is a lot of precipitation.
  - The storm subsides in a matter of minutes, and clear weather begins to prevail.

Similar Extreme Weather Events in India

➢ In 2023, India witnessed a **series of unprecedented climatic phenomena, i**ndicating a disturbing new normal caused by climate change.

- The onset of 2023 was marked by **scorching temperatures** that shattered a 123-year-old record in February.

In July 2023, when southwest monsoon was at its peak, rainfall was excessive in arid and semi-arid western half of the country, but heavily deficient in the eastern half of Indo-Gangetic plain, northeast and coastal areas

Large Deficient (-99 to -60%) Deficient (-59 to -20%) Normal (-19 to 19%) Excess (20 to 59%) Large Excess (60%)

Note: Data from July 1-31, 2023
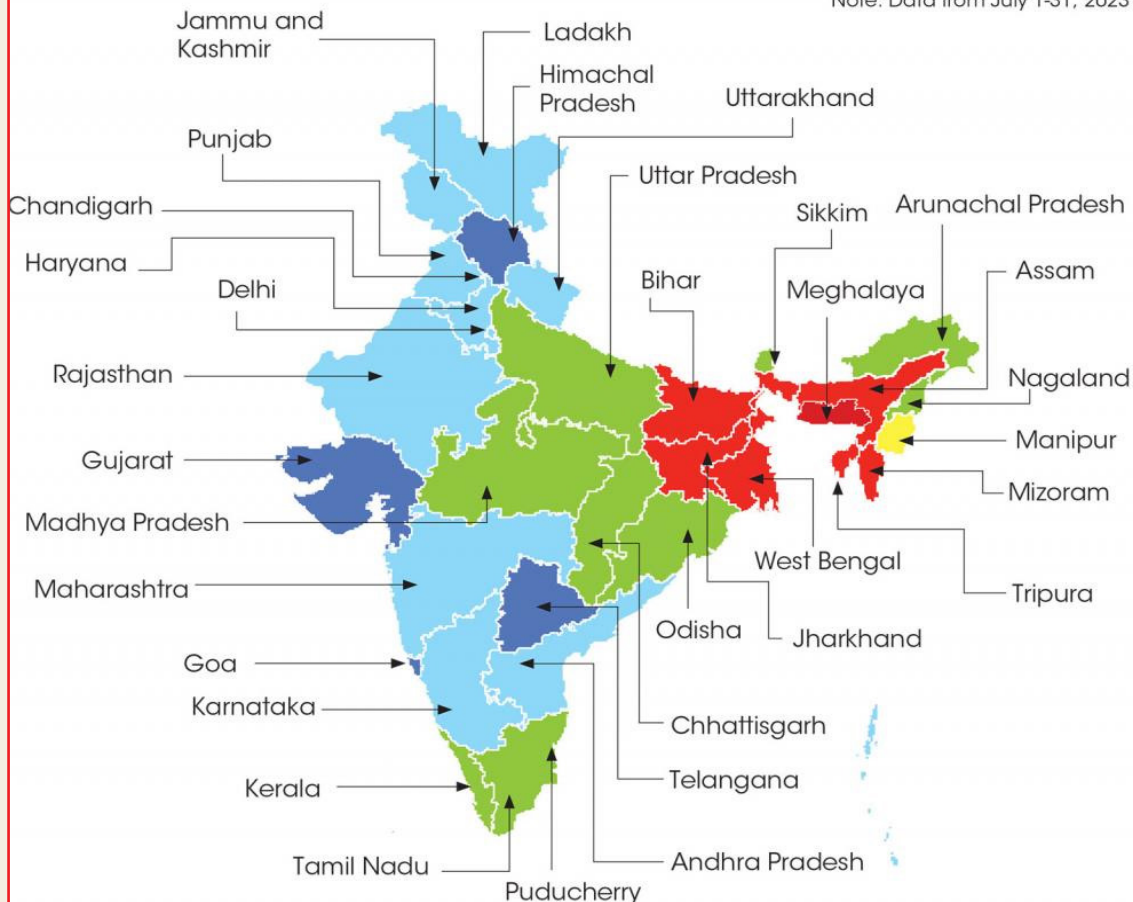
Note:

➤ **Cyclonic Event:** the Arabian Sea witnessed the formation of **cyclone Biparjoy**, which lasted a staggering 13 days, becoming the longest-duration cyclone since 1977.

➤ According to the **India Meteorological Department (IMD)**, India experienced extreme weather events on **314 of the 365 days** in 2022.

    ❍ **Loss of Human Lives**: Erratic weather conditions expose millions of Indians to climate disasters, kill thousands every year and increase economic hardships by eroding farm productivity.

    ❍ The events claimed 3,026 lives and damaged 1.96 million hectares (ha) crop area.

➤ **IPCC** assessments in 2023 also provided convincing evidence that global warming is triggering severe climate-related occurrences **like non-stop heavy rainfall.**

    ❍ India is losing **3-5% of its GDP** due to climate change and this number could rise to as much as 10% if the warming is not limited to below 2 degrees Celsius."

➤ **Shifting Monsoon Patterns:** It is characterised by prolonged deficit rainfall periods followed by intense downpours occurring over a few days.

    ❍ This pattern has been strengthening over the past several decades.

    ❍ The combination of warmer temperatures, increased moisture in the air, and the southwest monsoon's impact is resulting in heavy rainfall concentrated within a short span of time.

    ❍ Recent heavy rainfall in northern India can be attributed to the interaction between a low-pressure weather system known as the **western disturbance** and the **southwest monsoon**.

Marine Cloud Brightening

Why in News?

Recently, scientists are testing a **geoengineering technique called marine cloud brightening.**

➤ This method involves using machines **to inject tiny saltwater particles into marine stratocumulus clouds**, aiming to increase their reflectivity and cool the Earth.

COASTAL STUDY OF AEROSOL EVOLUTION WITH THE NEW CLOUD–AEROSOL RESEARCH INSTRUMENT (CARI)

Location: Coastal marine environment

Note:

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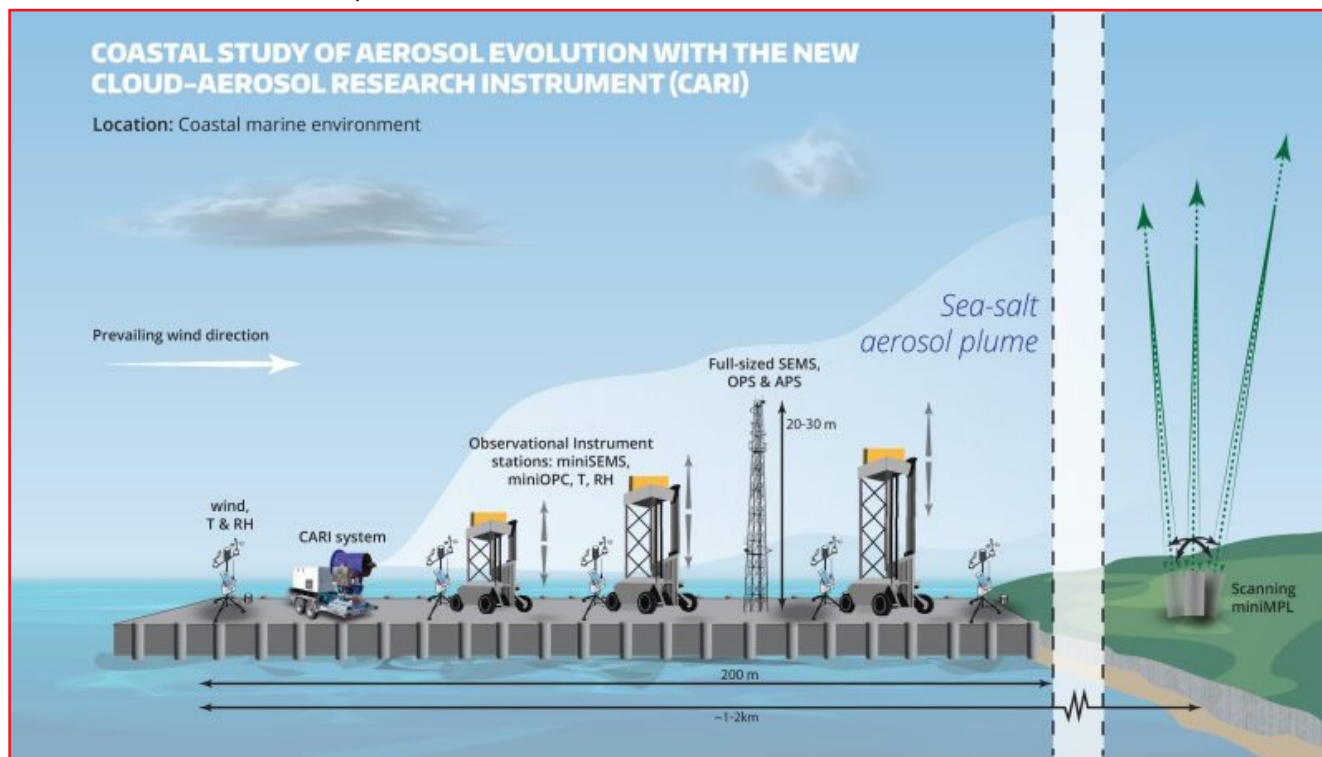
What is Marine Cloud Brightening?

➢ **About:**
  ❍ **Marine cloud brightening** is a scientific initiative that explores how **altering atmospheric particles (aerosols)** can **impact cloud reflectivity.**
  ❍ By releasing tiny **aerosol particles** into the atmosphere, researchers aim to enhance cloud brightness, leading to **increased sunlight reflection.**
  ❍ Aerosols of the **right size and concentration** could significantly **increase the reflectivity** of specific types of clouds.
  ❍ This phenomenon is visible in satellite images of clouds brightened by **ship emissions** (known as "ship tracks").

Basic Principle Behind Marine Cloud Brightening

Lower reflectivity — *Fewer Larger Drops*

Higher reflectivity — *More Smaller Drops*
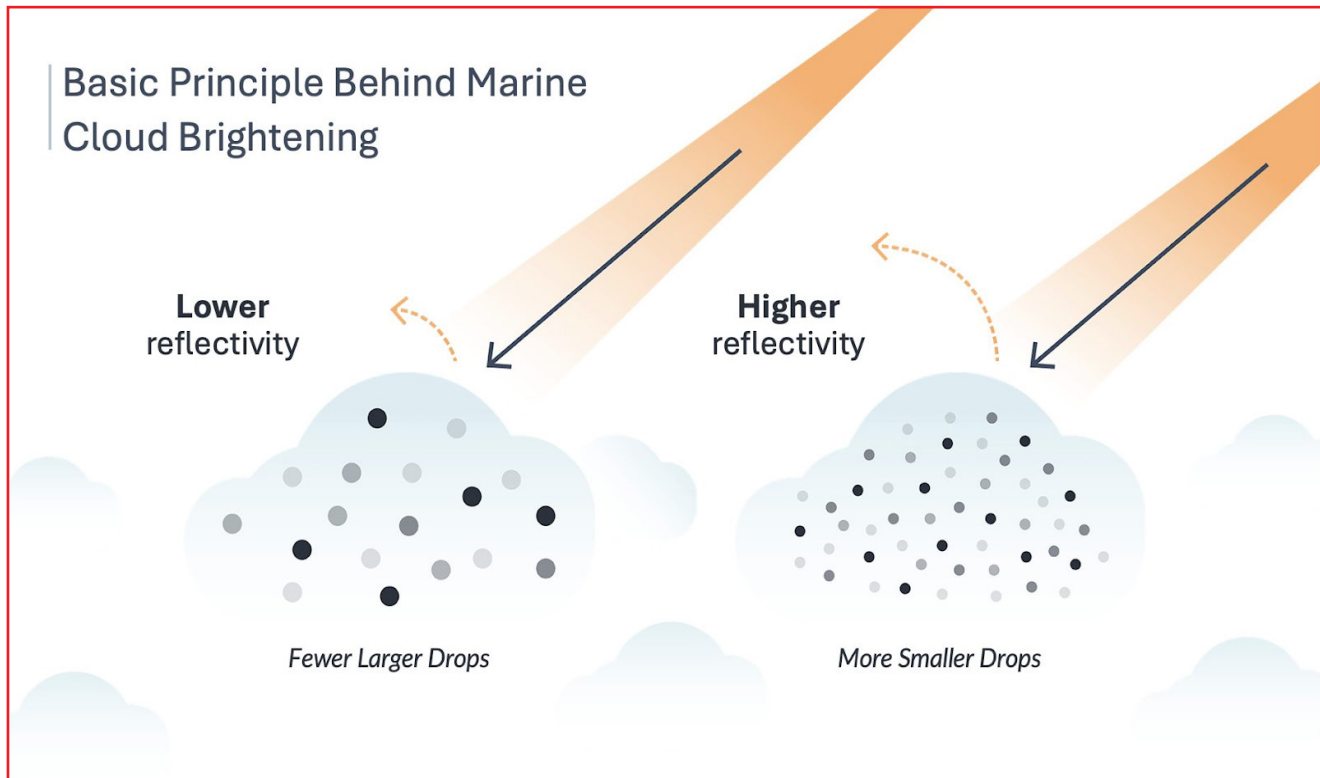
➢ **Goals of the Marine Cloud Brightening Program:**
  ❍ Better understanding of the present-day effects of **pollution aerosols** on clouds.
  ❍ Investigate whether aerosol particles made from **sea salt** could be used to intentionally reduce near-term climate warming while **greenhouse gas** concentrations are brought down to safer levels.
  ❍ Understand the **benefits, risks, and efficacy of the intentional use of aerosols** to reduce warming through different implementations of marine cloud brightening.

Aerosol and Climate Effect
➢ **Aerosol concentration** is **declining** due to expanding **air quality regulations**, leading to fewer particles in the atmosphere.
➢ Most aerosol particles have a **cooling effect on climate**, so their reduction adds to **global warming.**
➢ Scientists estimate that aerosols from human emissions are offsetting 0.5°C of global warming, but the **actual cooling effect** could range from 0.2°C to 1.0°C.
➢ Uncertainty about aerosol effects on clouds contributes to uncertainty in future warming projections.

Note:

What are the Challenges and Risks Associated with MCB?

➢ **Technical Feasibility:** MCB involves the **large-scale spraying of seawater** into the atmosphere at significant altitudes, which presents **engineering complexities** in terms of design, cost, maintenance, and operation of the spraying devices.

GEO-ENGINEERING

Geoengineering means manipulating the earth's climate to lower its temperature to counter global warming

◼ TYPES OF GEO-ENGINEERING

CARBON DIOXIDE REMOVAL

Technology/ Method Proposed	Proposed Effects/actions	Potential Side Effects	Feasibility/Cost Effectiveness
Land Use Management	Afforestation/ Reforestation	Minimum Side Effects	High feasibility, Low Cost
Bio-energy with carbon capture and storage (BECCS)	Biomass harvested and used as fuel	Potential land use conflict	Comparatively expensive
Direct CO_2 Capture	Industrial Process	Minimal	High technical feasibility
Fertilization of the ocean	Increased CO_2 absorption by promoting algae growth	High potential for adverse side effects	Feasible but not cost-effective
Accelerated Weathering	Pulverization of silicate rocks	Potential respiratory health impact	Could be combined with crop production, a feasible option at scale

SOLAR RADIATION MANAGEMENT

Stratospheric aerosol Injection	For reflecting sunlight back into space	Likely impact on the hydrological cycle	Feasible and potentially highly effective
Marine cloud brightening	Seeding of marine clouds with seawater aerosol	Likely impact on precipitation pattern	Low to medium cost and feasible at scale
Giant deflectors in outer space	Mirror placed in near earth orbit	Regional climate effects	Capital-intensive and long gestation
Surface albedo approaches	Painting the roof of the building bright white, Installing desert reflector	Major Impact on Desert Ecosystem	High labor and maintenance cost

REGULATION

↘ No specific international or Indian regulations on geoengineering.

INDIA'S EFFORTS

↘ **Department of Science and Technology:**
◇ Geoengineering climate-modelling research programme (since 2013)

↘ IISc:

◇ Initiative to understand the implications of solar geoengineering for developing countries
◇ Scientists simulated injecting 20 million tonnes of sulphate aerosols into the Arctic stratosphere

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Note:

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➢ **Environmental Impacts:** Alterations in cloud patterns and precipitation due to MCB **could affect regional climate** and hydrological cycles, potentially causing **unintended consequences like droughts or floods.**

   ○ Changes in clouds **over broad regions affect the circulation of the atmosphere, weather, and precipitation.**

   ○ Both marine cloud brightening **(MCB) and pollution aerosols can change clouds**, which in turn **affects regions** both nearby and far from where the brightening occurs.

➢ **Ethical Issues:** MCB raises **ethical dilemmas** about human intervention in natural processes and the governance and decision-making processes surrounding its implementation.

➢ **Moral Hazard:** MCB might lead to **complacency among policymakers** and the public, diminishing their commitment to reducing greenhouse gas emissions and adapting to climate change.

Conclusion:

➢ Marine Cloud Brightening (MCB), a **cutting-edge climate intervention**, remains in its **early research and development** stages. Scientists are diligently exploring its feasibility, efficacy, and potential impacts.

➢ **Sustainable human adaptation** is considered the sole novel approach among various geoengineering methods **to mitigate global warming and address climate change,** with acknowledgment of associated risks and uncertainties

India's New Post Office in Antarctica

Why in News?

Recently, the **Department of Posts** opened a second branch of the post office at the **Bharati research station** in Antarctica after almost four decades.

➢ Letters intended for **Antarctica** will now be addressed with **a new experimental PIN code, MH-1718,** typical for a new branch.

➢ **Currently, Maitri and Bharati are the two active research stations** that India operates in Antarctica.

What is the Significance of India's Post Office in Antarctica?

➢ **Historical Context:**

   ○ In 1984, India set up its **first post office** in Antarctica at **Dakshin Gangotri** (India's first research stations).

   ○ Unfortunately, in 1988-89, Dakshin Gangotri was submerged in ice and was subsequently **decommissioned.**

➢ **Continuing the Tradition:**

   ○ India established another post office at the **Maitri research station** in **Antarctica** on 26th January 1990.

   ○ India's two Antarctic research bases, **Maitri and Bharati,** though are 3,000 km apart but both come under the **Goa postal division.**

➢ **Operational Process:**

   ○ Letters meant for the post office in Antarctica are sent to the **National Centre for Polar and Ocean Research (NCPOR) in Goa.**

   ○ When a scientific expedition to Antarctica departs from NCPOR, a researcher carries the consignment of letters.

     ● At the research base, the letters are 'cancelled', brought back, and returned via post.

     ● The term 'cancellation' **refers to the mark placed** on a stamp or postal stationery to render it useless for reuse.

➢ **Strategic Presence:**

   ○ The existence of an Indian post office in Antarctica serves a **strategic purpose.**

   ○ Typically, an Indian post office operates within Indian territory. Antarctica, being foreign and neutral under the **Antarctic Treaty**, provides a unique opportunity to **assert India's presence** on the continent.

   ○ It **symbolises India's commitment** to scientific exploration and environmental stewardship.

➢ **Antarctica's Governance:**

   ○ The **Antarctic Treaty** neutralises territorial claims, **prohibits military operations** and nuclear tests, and emphasises scientific discovery.

   ○ Having an Indian post office in this foreign land **aligns with the treaty's** spirit.

What is India's Antarctic Programme?

➢ **About:**

  ❍ It is a **scientific research** and **exploration program** under the National Centre for Antarctic and Ocean Research (NCPOR). It started in 1981 when the first Indian expedition to Antarctica was made.

  • NCPOR was **established in 1998.**

INDIAN RESEARCH STATION IN ANTARCTICA
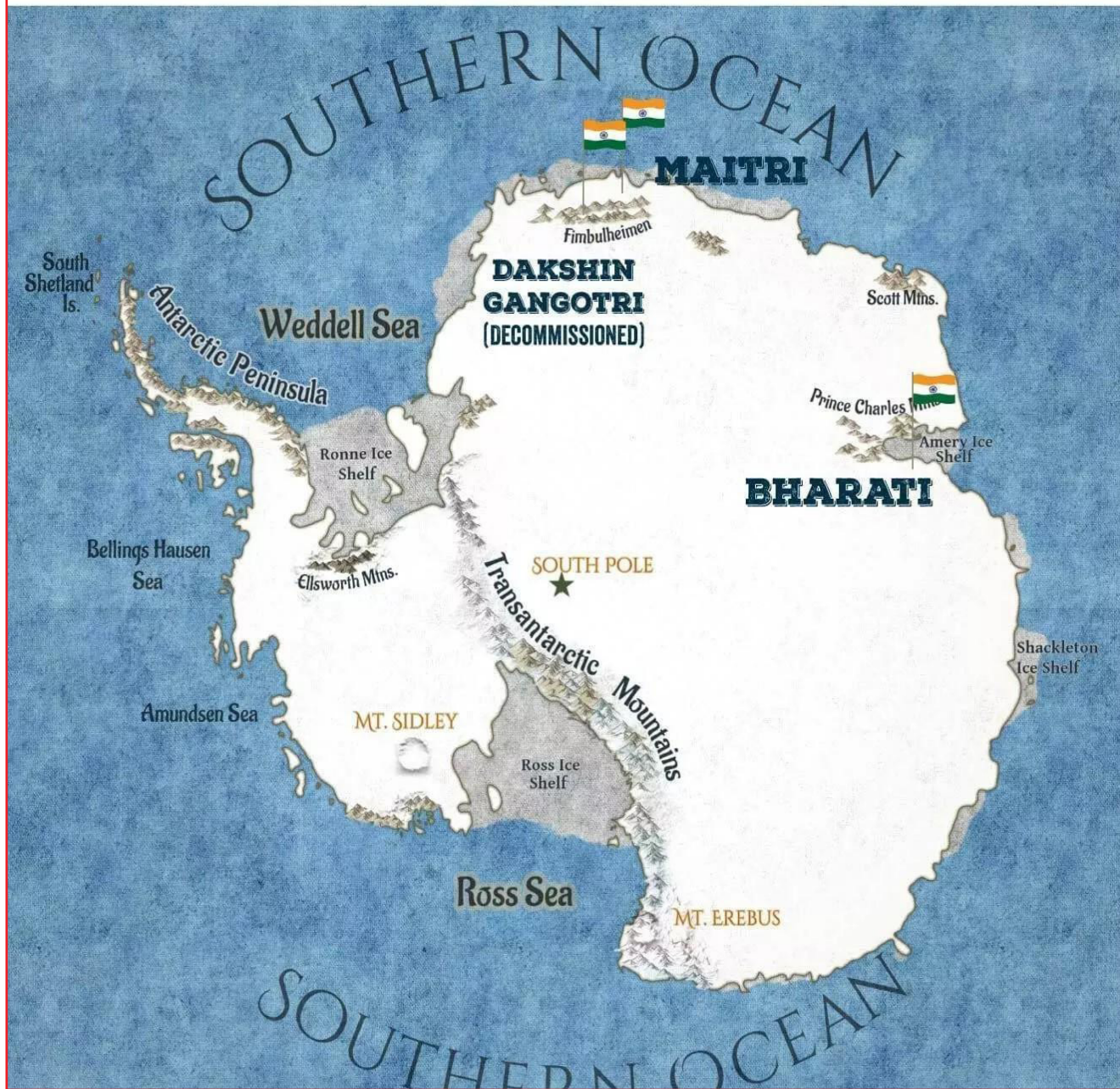
- ➢ **Dakshin Gangotri:**
  - ○ **Dakshin Gangotri** was the **first Indian scientific research base** station established in Antarctica, as a part of the Indian Antarctic Program.
  - ○ However, it **was submerged** in ice in 1988-89 and was subsequently **decommissioned.**
- ➢ **Maitri:**
  - ○ **Maitri** is India's **second permanent research station** in Antarctica. It was built and finished in 1989.
  - ○ Maitri is situated in the rocky mountainous region called **Schirmacher Oasis.** India also built a **freshwater lake** around Maitri known as **Lake Priyadarshini.**
- ➢ **Bharti:**
  - ○ **Bharti, India's latest research station operation since 2012**. It has been constructed to help researchers work in safety despite the harsh weather.
  - ○ It is India's first committed research facility and is located about 3000 km east of Maitri.
- ➢ **Other Research Facilities:**
  - ○ Sagar Nidhi:
    - ● In 2008, **India commissioned** the **Sagar Nidhi**, the pride of the **National Institute of Ocean Technology (NIOT)**, for research.
    - ● An ice-class vessel, it can cut through thin ice of 40 cm depth and is the first **Indian vessel to navigate Antarctic waters.**
    - ● The ship is the first of its kind in the country and has been used several times for the launch and retrieval of remotely operable vehicles (ROV) and the deep-sea nodule mining system, as well as for tsunami studies.

What is the Antarctic Treaty System?

- ➢ **About:**
  - ○ It is the whole complex of arrangements made to **regulate relations** among states in the Antarctic.
  - ○ Its purpose is to **ensure in the interests of all mankind** that Antarctica shall continue forever to be used exclusively for peaceful purposes and shall not become the scene or object of international discord.
  - ○ It is a global achievement and has been a hallmark of **international cooperation** for more than 50 years.
  - ○ These agreements are **legally binding** and purpose-built for the unique geographical, environmental, and political characteristics of the Antarctic and form a robust international **governance framework** for the region.

- ➢ **Challenges:**
  - ○ While the Antarctic Treaty has been able to successfully respond to a range of challenges, circumstances are radically different in the 2020s compared to the 1950s.
    - ● Antarctica is much more accessible, partly due to technology but also **climate change.** More countries now have substantive interests in the continent than the original 12.
    - ● Some global resources are becoming scarce, especially oil. There is considerable speculation regarding **nations' interests in Antarctic resources, particularly fisheries and minerals.**
    - ● Therefore, all of the treaty signatories, but especially those with significant stakes in the continent, need to give the future of the treaty more attention.
- ➢ **Major International Agreements of the Treaty System:**
  - ○ The 1959 Antarctic Treaty
  - ○ The 1972 Convention for the Conservation of Antarctic Seals
  - ○ The 1980 Convention on the Conservation of Antarctic Marine Living Resources
  - ○ The 1991 Protocol on Environmental Protection to the Antarctic Treaty

National Centre for Polar and Ocean Research (NCPOR)

- ➢ It was established as an **autonomous Research and Development** Institution of the **Ministry of Earth Sciences** on the 25th May 1998.
- ➢ Earlier known as the National Centre for Antarctic and Ocean Research (NCAOR), NCPOR is India's premier R&D institution responsible for the country's research activities in the Polar and Southern Ocean realms.
- ➢ It is the **nodal agency** for planning, promotion, coordination and execution of the entire gamut of polar and southern ocean scientific research in the country as well as for the associated logistics activities.
- ➢ **Its responsibilities include:**
  - ○ Management and upkeep of the **Indian Antarctic Research Bases "Maitri" and "Bharati", and the** Indian **Arctic base "Himadri".**
  - ○ Management of the **Ministry's research vessel ORV Sagar Kanya** as well as the other research vessels chartered by the Ministry.
    - ● The Ocean Research Vehicle (ORV) Sagar Kanya is a versatile ocean observing platform equipped with technologically advanced scientific equipment and related facilities.
- ➢ It is located in the state of Goa.

Note:

Volcanic Vortex Rings

Why in News?

Mount Etna, the largest volcano in Europe, and among the world's most active volcanoes, has been **sending up almost perfect rings of smoke into the air,** which is a rare phenomenon that scientists refer to as **volcanic vortex rings.**

What are Vortex Rings?

➢ Vortex rings are generated when **gas, predominantly water vapour, is released rapidly through a vent in the crater.**

➢ The vent that has opened up in volcano's crater is almost perfectly circular, so the rings that have been seen are also circular.

➢ Volcanic vortex rings were first observed at Etna in 1724 and have since been documented at various volcanoes worldwide.

➢ These rings can remain in the air for up to 10 minutes but tend to disintegrate quickly if conditions are windy and turbulent.
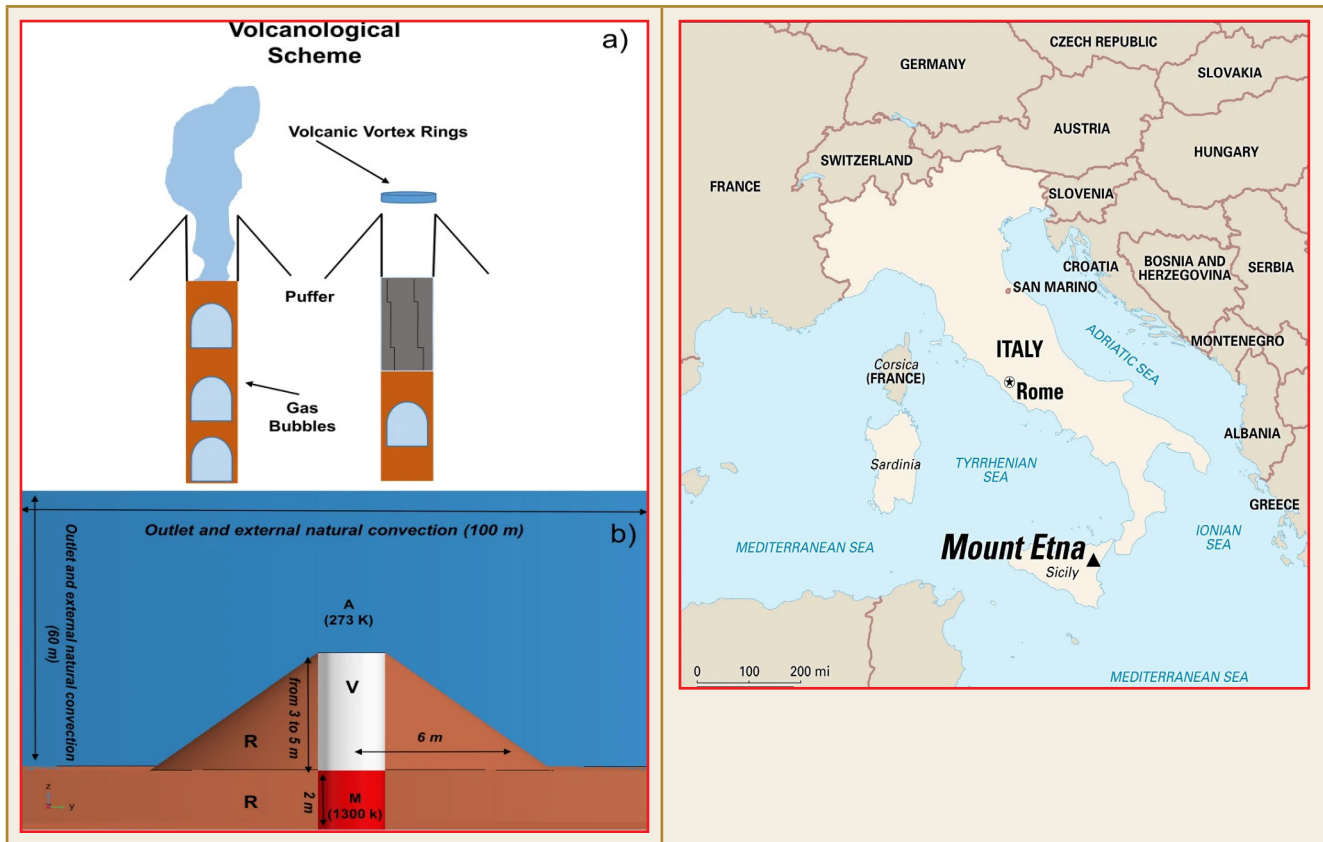
What are the Key Facts About Mount Etna?

➢ Mount Etna is a **stratovolcano**, which means it is composed of layers of lava, ash, and rocks that have accumulated over thousands of years of eruptions.

    ❍ Etna's **summit has five craters**, which are responsible for most of the volcano's eruptions and hundreds of lateral vents that can produce different types of eruptions, such as explosive, effusive, or mixed.

➢ It is located on the **east coast of Sicily**, an island in the **Mediterranean Sea** that belongs to Italy.

➢ Mount Etna has been erupting almost continuously **since 1500 BC,** making it one of the most **active volcanoes** in the world.

➢ Etna has been a **UNESCO World Heritage Site** since 2013.

Note:

VOLCANOES

A volcano is a vent or a fissure in the crust from which lava (molten rock), ash, gases, rock fragments erupt from a magma chamber below the surface

Diagram labels: Volcanic Bombs, Secondary Vent, Pipe, Crater, Main Vent, Lava Flow, Magma Chamber
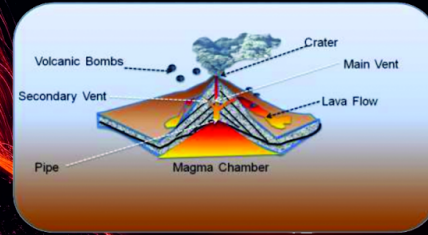
● **Types: On basis of –**

○ **Periodicity of Eruption:**
  ■ **Active volcano:** Recently Erupted
  ■ **Dormant Volcano:** Potential for eruption, no imminent signs
  ■ **Extinct:** No recent eruptions, low possibility in future

○ **Nature of Eruption:**
  ■ **Hawaiian:** Calmest types (low gaseous content)
  ■ **Strombolian:** Formation of large gas bubbles in magma
  ■ **Vulcanian:** More explosive
  ■ **Plinian eruptions:** Magma's volatile gases rise via a narrow conduit
  ■ **Icelandic:** Often build lava plateaus

○ **Shape of Volcanoes:**
  ■ Shield volcanoes: Composed of basaltic lava, low slope
  ■ Cone volcanoes (Cinder Cones): Most abundant
  ■ Composite cones (stratovolcanoes): Formed by layers of diverse materials.

● **Volcanic Features:**

○ **Extrusive :**
  ■ **Crater:** Cone-shaped vent for magma
  ■ **Caldera:** Large, crater-like depression
  ■ **Volcanic Plateaus:** Leveled areas from fissure eruptions

○ **Intrusive:**
  ■ **Batholiths:** Central core of a volcanic mountain.
  ■ **Dyke:** Vertical intrusion cutting across country rock bedding.
  ■ **Sills:** Tabular intrusions along sedimentary bedding.
  ■ **Laccoliths:** Magma injection along horizontal sedimentary bedding.

○ **Minor:**
  ■ **Geysers:** Underground water above 100°C, powered by magma, results in powerful eruptions with steam and diluted minerals.
  ■ **Hot Springs:** Heated water flows quietly along fault zones.

● **Distribution of Volcanoes:**
  ○ Subduction zones (Circum Pacific Belt)
  ○ Divergence zones (Mid Atlantic Ridge)
  ○ Intra-plate oceanic volcanism (Hawaiian chain)
  ○ Mid-continental belt and volcanoes in Mediterranean region

● **Volcanoes in India:**
  ○ No volcanoes in Himalayans
  ○ Barren Island (Only active volcano)

● **Products of Volcanic Eruption:**
  ○ **Gases:** H, C, O, S, N, CH_4, NH_3
  ○ **Solid:** Pyroclastic materials
  ○ **Liquid:** Lava

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Volcano Facts

The Bad

Ash
• Causes respiratory problems
• Triggers lightning

H2O (water vapour)
Largest contributor to greenhouse gas effect on earth

CO2 (carbon dioxide)
• Toxic in large amounts >10%
• Contributes to global warming

SO2 (sulfur dioxide)
Dissolves in water vapour to form damaging acid rain

H2S (hydrogen sulfide)
Highly toxic gas that smells like rotten eggs

92,000 People killed in the deadliest volcano in Indonesia in 1815

20 Volcanoes are erupting right Now

Supervolcanoes can plunge the world into an ice age

The Good

Source of materials
Metals, precious gems, and construction material

Power Generation
Geothermal and hydroelectric opportunities

Rich volcanic soils
Yay coffee! The best coffee grows in volcanic soils

Krakatoa eruption ruptured eardrums within 50 KM radius

2X more ash by weight erupted from Mt. St Helens (USA) in 1980 than garbage the entire US produces in 1 year

$2.2 Billion worth of electrical energy wasted by Krakatoa volcano in 1883, Indonesia

Note:

Drought in East Flowing Rivers

Why in News?

At least 13 east-flowing rivers between **Mahanadi** and Pennar have no water at the moment, according to an analysis of data released by the **Central Water Commission (CWC).**

What is the Crisis Faced by the East-Flowing Rivers in India?

➢ **Water Crisis in East-Flowing Rivers Basin:**
  ❍ At least 13 east-flowing rivers between Mahanadi and Pennar have no water at the moment, including Rushikulya, Bahuda, Vamsadhara, Nagavali, Sarada, Varaha, Tandava, Eluru, Gundlakamma, Tammileru, Musi, Paleru, and Munneru.
  ❍ These rivers **flow through** the states of Andhra Pradesh, Telangana, and Odisha, draining directly into the **Bay of Bengal.**
  ❍ The storage in the basin has been declining continuously this year, reaching zero on 21st March, compared to 32.28% of the capacity at the same time last year.

➢ **Water Crisis in Other River Basins:**
  ❍ The **Cauvery**, Pennar, and east-flowing rivers between Pennar and Kanniyakumari are also facing deficient or highly deficient water storage.
  ❍ The **Ganga basin**, the largest basin in the country, has recorded water storage at less than half of its total capacity, lower than the corresponding period last year.
    ● **Narmada, Tapi, Godavari, Mahanadi, and Sabarmati river** basins have also recorded storage levels relative to their capacities.

➢ **National Water Crisis:**
  ❍ India's 150 **major reservoirs** have only **36% of their total capacity** in live storage, with at least **six reservoirs recording no water storage.**
  ❍ Around 286,000 villages in 11 states located on the **Ganga basin** are experiencing a **decline in water availability.**
  ❍ Overall, at least **35.2%** of the **country's area** is under abnormal to exceptional degrees of **drought**, with 7.8% under extreme drought conditions and 3.8% under exceptional drought.

● States like **Karnataka and Telangana** are grappling with drought and drought-like conditions due to rainfall deficits.

Central Water Commission (CWC)
➢ The Central Water Commission is the **apex technical organisation** in the country for the development of water resources and is an attached organisation of the Ministry of Water Resources.
➢ The Commission is responsible for initiating, coordinating, and furthering, in consultation with the State Governments, the schemes for control, conservation, development and utilization of water resources throughout the country for the purpose of irrigation, flood management, power generation, navigation etc.

Difference between East and West Flowing Rivers

East-flowing rivers of the Peninsular Plateau	West-flowing rivers of the Peninsular Plateau
Major rivers flowing eastwards: Mahanadi, Godavari, Krishna, Kaveri	Only two long rivers flow westwards: Narmada, Tapi
Flow into the Bay of Bengal	Flow into the Arabian Sea
Carry greater amount of sediments, so form deltas at their mouths	Carry lesser amount of sediments, so form estuaries at their mouths
Greater number of tributaries	Lesser number of tributaries

What are the Reasons for the Drying of East-Flowing Rivers?

➢ **Deforestation and Soil Erosion:** Deforestation along the river banks and in the **catchment areas** has reduced the soil's ability to retain water, leading to **reduced groundwater recharge** and lower river flows.

➢ **Climate Change:** Changing weather patterns, including **irregular rainfall** and **increased temperatures**, are affecting the flow of these rivers. **Climate change** can lead to prolonged droughts, reducing the water flow in rivers.

➢ **Construction of Dams:** The construction of dams and **water diversion** for irrigation purposes has also reduced the downstream flow of rivers, impacting the river's natural flow patterns and ecosystems.

Note:

drishti

○ **Water pollution** from industrial, agricultural, and domestic waste, as well as **invasive species** like water hyacinths, degrades river water quality, harming aquatic life and overall river health.

➢ **Sand Mining:Unregulated** sand mining along the river beds has disrupted the river's flow and **caused erosion**, leading to the drying up of river stretches.

➢ **Urbanisation and Encroachment:** Urban expansion and **encroachment along river banks** have altered the natural flow of rivers and reduced the availability of water for the river.

➢ **Lack of Awareness and Conservation Efforts:** Limited awareness about the importance of river conservation and **lack of effective conservation** measures contribute to the drying up of these rivers.

INDIA
Rivers of India

● City Bank
— River

*Map not to be scale

Note:

What Measures are Necessary to Address the Issue of River Drying?

➢ **Water Conservation Measures:** Implementing water conservation techniques such as **rainwater harvesting**, watershed management, and soil moisture conservation can help replenish groundwater.

  ❍ It will reduce reliance on river water, which will contribute to maintaining the minimum flow of water in the rivers.

➢ **Efficient Irrigation Practices:** Encouraging farmers to adopt **efficient irrigation practices** such as drip irrigation and sprinkler irrigation can reduce water wastage and ensure sustainable use of water resources.

➢ **Afforestation and Vegetative Cover:** Increasing **vegetative cover** through afforestation and reforestation can help maintain river flow by reducing soil erosion and increasing groundwater recharge.

➢ **Regulation of Groundwater Extraction:** Implementing **strict regulations** on groundwater extraction can help maintain the base flow of rivers and prevent their drying up.

➢ **Interlinking of Rivers:** Exploring the feasibility of **interlinking rivers** to **transfer surplus water** from water-rich regions to water-deficient regions can help in maintaining river flow. **For example Ken-Betwa River link project.**

➢ **Community Participation:** Involving **local communities** in water management and conservation efforts can ensure sustainable use of water resources and maintain river flow.

➢ **Policy Reforms:** Implementing **policy reforms** to promote sustainable water management practices and regulate water use can help in combating the drying up of rivers.

➢ **Research and Development:** Investing in **research and development** of new technologies and practices for water conservation and management can help in finding innovative solutions to combat the problem.

Note:

Miscellaneous

Highlights

- *Doordarshan Logo*
- *Padma Awards 2024*

- *Colossal Snake Fossil Unearthed in Gujarat*

Doordarshan Logo

Why in News?

National broadcaster **Doordarshan (DD)** has changed the colour of its historic flagship logo from red to saffron.

➤ Political parties accused the public broadcaster of adopting a colour closely associated with the ruling political party, especially because the change was made in the middle of the election process. DD said the change was only one of visual aesthetics.

What is the History of Doordarshan?

➤ **About:**
  ○ Doordarshan is an **autonomous public service broadcaster** founded by the Government of India, which is one of two divisions of **Prasar Bharati.**
  ○ **Prasar Bharati** is a statutory autonomous body (under **the Prasar Bharati Act, 1997)**. It is the Public Service Broadcaster of the country.
    ● Its main objective is to **provide autonomy to Doordarshan and Akashvani** to educate and entertain the public.
  ○ It was first aired on **15th September 1959**, as a public service telecasting service.
  ○ It became a broadcaster with daily transmissions of morning and evening shows in 1965, having transmission in Delhi.
  ○ On 1st April 1976, it came under the **Information and Broadcast Ministry** and in 1982, Doordarshan became the National broadcaster.
  ○ At present, Doordarshan operates 6 national and 17 regional channels.
  ○ The signature Doordarshan tune was composed by sitar virtuoso **Pandit Ravi Shankar** and the master shehnai player **Ustad Ali Ahmed Hussain Khan** and was aired for the first time on 1st April 1976.

➤ **History of Logo:**
  ○ The original 'Eye' logo was designed by **Devashis Bhattacharyya** of the **National Institute of Design (NID).**
    ● The logo was picked by **Prime Minister** Indira Gandhi in the early 1970s out of a few design options.
  ○ The **two curves** represent a variation of the classic depiction of **yin and yang**, the ancient **Chinese philosophy of contradictory** and inseparable opposites.
  ○ *Satyam Shivam Sundaram***(Truth, Goodness, Beauty),** the tagline in the initial versions of the logo, was removed in the later adaptations.

Padma Awards 2024

Why in News?

Recently, **President Droupadi Murmu** presented the prestigious **Padma Awards of 2024** to a distinguished group of people.

Who were the Recipients of the Padma Awards in 2024?

➤ The group included former **Vice-President M. Venkaiah Naidu**, actor and politician Mithun Chakraborty, singer Usha Uthup, and **tennis player Rohan Bopanna** and others.

Note:

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➢ The founder of Sulabh International Bindeshwar Pathak and**Bharatanatyam** dancer Padma Subrahmanyam were conferred with **Padma Vibhushan.**

➢ For 2024, the President had approved the conferment of **132 Padma awards**, including two duo cases (in a duo case, the Award is counted as one).

    ❍ The list comprises **5 Padma Vibhushan, 17 Padma Bhushan and 110 Padma Shri Awards**.

    ❍ 30 of the awardees are women, 8 persons from the category of **Foreigners/NRI/PIO/OCI** and 9 Posthumous awardees.

What are the Key Points About the Padma Awards?

➢ **Background:**

    ❍ The Padma Awards are **announced annually on Republic Day** (26th January).

    ❍ Instituted in **1954**, it is one of the **highest civilian honours** of India.

➢ **Objective:**

    ❍ To recognise achievements in all fields of activities or disciplines where **an element of public service** is involved.

➢ **Categories:**

    ❍ The Awards are given in three categories:

      ● **Padma Vibhushan** (for exceptional and distinguished service),

      ● **Padma Bhushan** (distinguished service of higher order) and

      ● **Padma Shri** (distinguished service).

    ❍ **Padma Vibhushan is highest** in the hierarchy of Padma Awards followed by Padma Bhushan and Padma Shri.

➢ **Disciplines:**

    ❍ The awards are given in various disciplines/ fields of activities like **art, social work, public affairs, science and engineering, trade and industry, medicine, literature and education, sports, civil service,** etc.

➢ **Eligibility:**

    ❍ **All persons without distinction** of race, occupation, position or sex are eligible for these Awards.

➢ **Selection Process:**

    ❍ **Padma Awards Committee:**

      ● The Awards are conferred on the recommendations made by the Padma Awards Committee, which is **constituted by the Prime Minister every year.**

    ❍ **Awarded by President:**

      ● The awards are presented by the President of India usually in March/April every year.

Bharat Ratna

➢ It is the **highest civilian award in the country.** It is awarded in recognition of exceptional service/ performance of **the highest order in any field of human endeavour.**

➢ It is treated on a different footing from the **Padma Award.** The recommendations for Bharat Ratna are made by the Prime Minister to the President of India.

➢ Usually, three Bharat Ratna awards are given in a year. However, this year in 2024, the **government has named five people for Bharat Ratna.**

Abolition of Titles Under Article 18 of the Constitution

➢ **Article 18(1)** of the Indian Constitution **abolishes all titles and prohibits the state from conferring titles** on any individual, whether they are a citizen or a non-citizen.

    ❍ However, military and academic distinctions are exceptions to this prohibition.

    ❍ This means that universities, for instance, can grant titles or honours to individuals based on their merit.

➢ A **"title" refers to an attachment to one's name, such as a prefix or suffix** (e.g., Sir, Nawab, Maharaja).

    ❍ In a democracy, **the creation of titles and titular glories** is discouraged as it goes **against the principles of social equality.**

➢ **Awards like "Bharat Ratna," "Padma Vibhushan," and "Padma Shri" are not prohibited under Article 18** because they signify state recognition of exceptional work by citizens in various fields.

    ❍ In the landmark judgment *Balaji Raghavan v. Union of India, 1996,* the court held that **National awards aren't titles under clause 1 of Article 18.**

Note:

➢ In the case of *Indira Jaising v. Supreme Court of India, 2017*, a complaint was lodged to **question the usage of the term 'senior advocate'** before the names of the advocates.

    ❍ The Supreme Court ruled that **this is not the title, but rather a demarcation,** and therefore **does not violate Article 18 of the Indian Constitution.**

CIVILIAN AND GALLANTRY AWARDS

CIVILIAN AWARDS

Bharat Ratna

- India's highest civilian award; instituted in 1954
- Awarded for exceptional service/performance of the highest order in any field of human endeavour
- Award includes certificate & medallion (no monetary grant)
- Recommended to President by the PM
- Can be given (max) thrice per year

Padma Awards

- Instituted in 1954; announced annually on eve of Republic Day
- Recognises achievements in all fields/disciplines involving public service
- Categories: Padma Vibhushan > Padma Bhushan > Padma Shri
- Recommended by Padma Awards Committee (constituted by PM annually)
- Suspended twice - 1978-79 and 1993-97
- Max no. of awards per year - 120

GALLANTRY AWARDS

- Wartime Gallantry instituted on 26th January 1950
- Peacetime Gallantry instituted on 4th January 1952
- Announced twice a year - Republic Day and Independence Day
- Order of Precedence - Param Vir Chakra > Ashoka Chakra > Mahavir Chakra > Kirti Chakra > Vir Chakra > Shaurya Chakra

- Eligibility -
  » All officers of all ranks (Army, Navy, IAF), Reserve forces, Territorial army
  » People providing nursing services under any of the above forces

Wartime Gallantry Awards

Param Vir Chakra

Maha Vir Chakra

Vir Chakra

Peacetime Gallantry Awards

Ashoka Chakra   Kirti Chakra   Shaurya Chakra

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Colossal Snake Fossil Unearthed in Gujarat

Why in News?

Recently, palaeontologists (experts concerned with fossil animals and plants) in India have discovered the fossilised remains of a **colossal snake** that roamed the swamps of Gujarat approximately 47 million years ago.

➢ Researchers suggest *Vasuki indicus* rivalled the infamous **Titanoboa**, being one of the largest known predators.

What are the Key Findings About Vasuki Indicus?

➢ **About:**
  ○ *Vasuki Indicus*: The newly identified species, *Vasuki indicus*, belongs to the now-extinct **Madtsoiidae snake family.**
    ● It is **a Gondwanan terrestrial snake**, that lived during the warm Middle Eocene period, spanning from the **Upper Cretaceous** (100.5 to 66 mya (million years ago)) to the Late Pleistocene epochs (0.126 to 0.012 mya).
  ○ **Size Estimates:** The fossilised remains suggest lengths between **10.9 and 15.2 metres,** surpassing even the largest modern snakes.
    ● This discovery sheds light on the evolution of **large body sizes,** possibly influenced by high temperatures in the **tropical zones** of that era.
    ● The warm Middle Eocene climate likely played a role in the evolution of large body sizes among ancient snakes.
      ■ *Vasuki indicus* thrived during this period, adapting to the tropical conditions.
  ○ **Biogeography Implications:** The presence of this giant **Eocene snake** has significant implications for **madtsoiid biogeography.**
    ● It provides insights into how organisms were geographically distributed during that time and the factors driving their evolution.
  ○ *Vasuki indicus* **Named After Mythical Serpent:**
    ● The species is named after Vasuki, a serpent associated with **Lord Shiva** in Hindu mythology.
    ● This connection adds **cultural significance** to the discovery.

➢ **Other Large Snake:**
  ○ **Titanoboa (*Titanoboa cerrejonensis*):**
    ● **Titanoboa is an extinct snake** that lived during the **Paleocene Epoch** (66 to 56 mya), considered to be the **largest known member** of the **suborder Serpentes**.
    ● From extrapolations of body size made from excavated vertebrae (individual sections of the backbone), palaeontologists have estimated that the body length of the average adult Titanoboa was roughly 13 metres and the average weight about 1.25 tons.
  ○ **Anaconda *(genus Eunectes):***
    ● **Anaconda** classified in the **family Boidae**, are large, constricting, water-loving snakes found in **tropical South America**, with three to five species.
    ● Green anacondas are among the **largest snakes** in the world, growing up to 9 meters long and weighing up to 250 kg.

What are the Key Facts About the Madtsoiidae Family of Snakes?

➢ The Madtsoiidae family of snakes, now extinct, once roamed the ancient lands of **Gondwana.**
➢ Their fossil record spans from the **early Cenomanian period** (during the Upper Cretaceous) to the late Pleistocene.
  ○ These fascinating serpents left their traces in various regions **across the globe,** including **South America, Africa, India, Australia, and Southern Europe.**
➢ **Genera and Diversity:**
  ○ **Vasuki:** Known for its impressive length, measuring at least 11–12 meters (approximately 36–39 feet).
  ○ **Wonambi and Yurlunggur:** These Australian snakes also belong to the Madtsoiidae family.
    ● These ancient snakes probably used a hunting strategy akin to modern boas and pythons by constricting their prey.
➢ **Evolutionary Significance:**
  ○ Madtsoiids persisted in **Australia** until the Pleistocene, but their existence elsewhere declined during the Eocene epoch.
  ○ While some species survived in South America and India through the Oligocene, their overall presence waned.

Note:
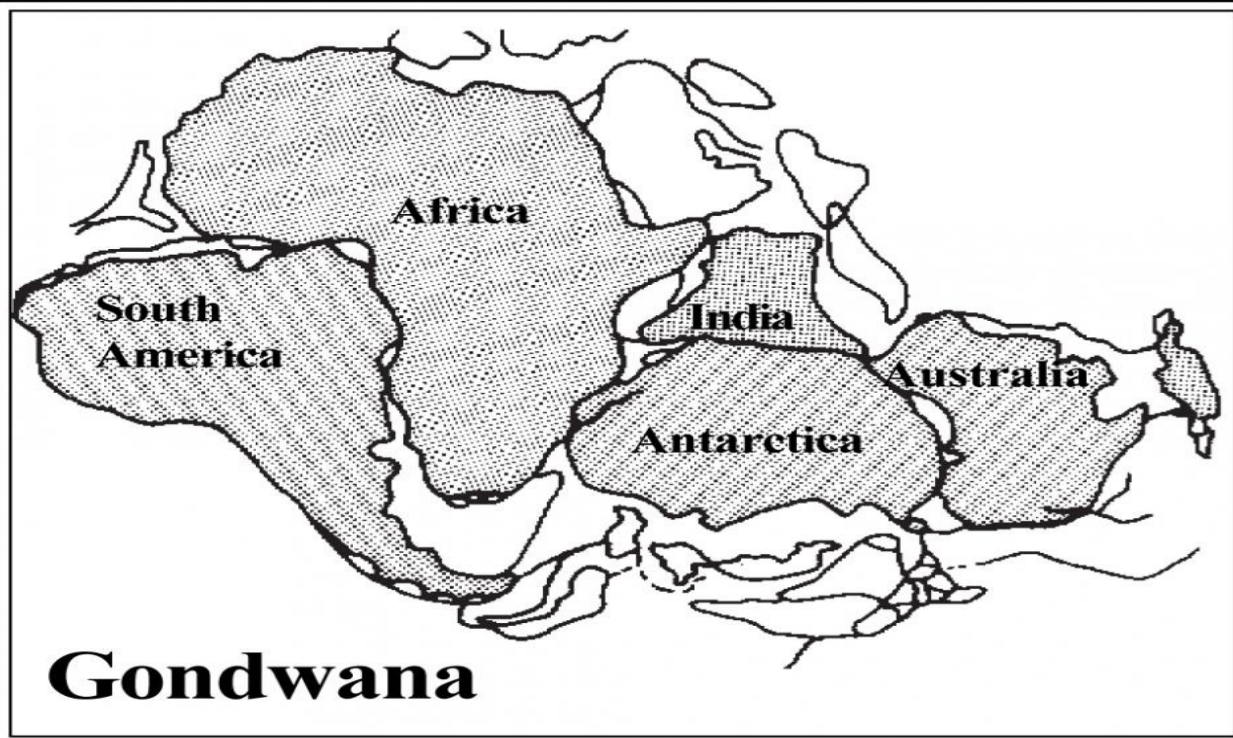
Gondwana

The land masses of the world were once joined into a super-continent called Pangaea. This separated into two smaller land masses, Laurasia in the north and Gondwana in the south. Australia was part of Gondwana.

■■■

Note:

Rapid Fire Current Affairs

Highlights

- D.K. Tripathi as Chief of the Naval Staff
- Muria Tribe
- Water Hyacinth
- Exercise Poorvi Leher
- Chagas Disease
- Kuchipudi
- India's Outward FDI Trends
- Raja Ravi Varma's Indulekha
- India's Forex Reserves Drop
- Miyawaki Method
- Exoskeleton Technology
- Bogota's Water Rationing Crisis
- Padta Bet
- Dragon's Egg Nebula
- IHRC Adopts a New Logo and Motto
- SC Allows Abortion of 30-Week Foetus
- Gold-Spewing Volcano of Antarctica
- English Channel
- Groundwater Recharge Challenges
- C-CAMP Joins BFI-Biome Virtual Network Program
- Infrastructure investment trust (InvIT)
- Next-Gen Sodium Batteries
- National Panchayati Raj Day 2024
- India's Biggest Climate Clock
- Youngest WorldChess Champion
- Dragonfly Rotorcraft Mission
- Euvichol-S
- Neptis Philyra
- Star Campaigners of Political Parties
- Verification Mechanism in RoDTEP Scheme
- Myanmar's Karen Ethnic Minority
- Women Navy Officers on Transoceanic Expeditions
- India Delivers BrahMos Missiles to Philippines
- Geofencing
- Archaeological Sites Discovered in Telangana
- Lake Kariba of Africa
- Chennai's Veeranam Lake
- Hokkaido, Japan's Garden of Gods
- Goldene
- Infectious Respiratory Particles
- Nifty Next 50 index
- Man Portable Anti-Tank Guided Missile
- Russian Peacekeepers' Withdrawal from Nagorno-Karabakh
- Kandukuri Veeresalingam
- NASA's Mars Sample Return Program
- Environmental Movement in Indonesia
- Fourth Global Mass Coral Bleaching Event
- TRAI Recommendations for Regulatory Sandbox
- Starlink Project
- Operation Meghdoot
- CWG Stares at Uncertain Future
- Ultrasonic Calls of Brazilian Leaf Litter Frogs
- UNFPA State of World Population Report
- Novel Hydrogel to Remove Microplastics
- Nigeria Leads with New Meningitis Vaccine
- Nostro and Vostro Accounts
- Thrissur Pooram
- Geroscience
- Baltimore Bridge (Francis Scott Key Bridge)
- Erez Crossing
- Exercise DUSTLIK
- Mercenary Spyware Attack
- IPEF to Organise Clean Economy Investor Forum
- 61st National Maritime Day

D.K. Tripathi as Chief of the Naval Staff

The Government has appointed **Vice Admiral Dinesh Kumar Tripathi,** as the **next Chief of the Naval Staff.** Before this he served as the Vice Chief of the Naval Staff**.**

➢ He assumed the charge, after the retirement of **Admiral R Hari Kumar** from service on 30th April 2024.

Note:

➤ Vice Admiral Tripathi has served the Indian Navy for nearly 39 years. He was commissioned into the Executive Branch of the Indian Navy on 01st July 1985.

  ○ He had served as the **Flag Officer**, Commanding-in-Chief, Western Naval Command.

  ○ He is a **Communication and Electronic Warfare specialist.**

  ○ He has commanded **Indian Naval Ships Vinash, Kirch**and **Trishul.**

➤ He has also held various important operational and staff appointments which include Fleet Operations Officer of the Western Fleet, Director of Naval Operations and Principal Director, Naval Plans at New Delhi.

➤ He was appointed as Commandant of the prestigious **Indian Naval Academy** at Ezhimala, Kerala.

➤ He is an alumnus of Sainik School Rewa and **National Defence Academy**, Khadakwasla.

Read more:Indigenisation Efforts of Navy

Muria Tribe

Muria Tribe, living in the border areas between **Andhra Pradesh (AP)** and **Chhattisgarh** are possessing voter cards of both the States, one is to exercise their franchise and the other is for references and proof of their nativity.

➤ Their settlement lies within **'India's Red Corridor'** on the Andhra Pradesh-Chhattisgarh border hit by **Naxalism**, and stands as an oasis within a reserved forest, protected by stringent laws prohibiting settlement and deforestation.

➤ The Muria settlements are known as habitations of **Internally Displaced People (IDPs)**, whose population is around 6,600 in AP, and the Murias here are referred to as '**Gutti Koyas'** by the native tribes.

➤ This Tribe was displaced during the conflict between **Maoists** and**Salwa Judum.**

  ○ Salwa Judum is a group of tribal persons mobilised for resistance against outlawed armed naxalites.

  ○ The group was reportedly backed by government machinery in Chhattisgarh.

➤ The **Muria** are an indigenous **Adivasi**, scheduled tribe **Dravidian** community of the Bastar district of Chhattisgarh, India. They are part of the **Gondi** people.

  ○ They speak Koya, which is a Dravidian language.

  ○ They have progressive perspective towards marriage and life as a whole.

  Read more: **Muria Tribe**

Water Hyacinth

National Green Tribunal (NGT) has mandated that for using chemical bioenzyme "**draynzyme**" for treatment of **water hyacinth**, scientific approval by **Central Pollution Control Board (CPCB)**and**Indian Institute of Toxicology Research**, Lucknow is necessary.

➤ **Draynzyme** will be approved for usage **only when it is confirmed** that there are no detrimental effects on the ecological balance of the water body.

➤ **Urban Local Bodies** decided to spray bio-enzymes or natural chemicals on rivers and lakes to control the mosquito outbreak.

➤ Water Hyacinth is scientifically known as *Eichhornia crassipes.*

  ○ It is an **aquatic weed** common in water bodies across South Asia, including India.

➤ Draynzyme is an enzyme-based product that is used for treatment of water hyacinth.
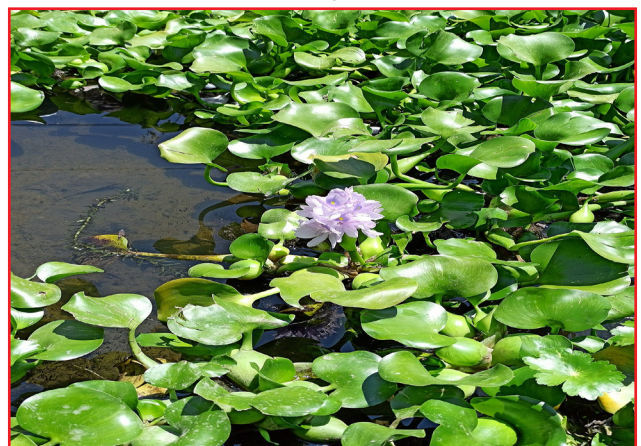
Read more: Water Hyacinth

Note:

Exercise Poorvi Leher

Recently, the **Indian Navy** conducted a **Military Exercise** named "**Poorvi Lehar**" on the Eastern Coast of India.

➤ The exercise aimed to assess the Indian Navy's preparedness to meet **Maritime Security challenges** in the region.

➤ Ships, submarines, aircraft and special forces from the **Indian Air Force (IAF)**, **Andaman & Nicobar Command** and **Coast Guard** participated in the exercise, indicating a very high degree of **interoperability** among the Services.

➤ The exercise was conducted in **multiple phases**:

　○ **Tactical phase:** Combat training in a realistic scenario, and

　○ **Weapon phase** by conducting various firings successfully.

➤ A continuous **maritime domain awareness** was maintained throughout the Area of operations by operating aircraft from diverse locations.

➤ It reaffirmed the **Indian Navy's** capability to deliver ordnance on target.

Read more: Indian Navy Day 2023

Chagas Disease

Recently, the **World Health Organisation (WHO)** observed **World Chagas Disease Day** on 14th April 2024 to raise awareness about the little-known disease that affects millions of people, especially in Latin America.

➤ The theme for the year 2024 is "**Tackling Chagas Disease: Detect Early and Care for Life**".

➤ **Chagas disease** also known as "**silent or silenced disease**", is a **communicable parasitic disease** that infects 6-7 million people and claims around 12,000 lives every year worldwide, according to WHO.

　○ It is caused by the **protozoan parasite** named *Trypanosoma cruzi*.

　○ It can also be contracted through **congenital transmission**, **blood transfusions,** organ transplantation, consumption of uncooked food contaminated with faecal matter of infected bugs, or accidental laboratory exposure.

　○ It cannot propagate by casual contact with infected humans or animals.

➤ The disease manifests as **fever, headaches, rashes, inflammatory nodules,** nausea or **diarrhoea**, and muscle or abdominal pain.

➤ There are currently no **vaccines** available for Chagas disease, but **antiparasiticmedicines** **Benznidazole** and **Nifurtimox** can treat the disease.

Read More: **World Chagas Disease Day**

Kuchipudi

Kuchipudi, one of the oldest dance forms of India, is now becoming obsolete among the younger generation. **Kuchipudi** is a **village** in the Krishna district in Andhra Pradesh.

➤ Kuchipudi is a **dance-drama performance**, which used to be confined to men in the olden days. It plays stories of **Hindu mythologies** and spreads its message among the people. **Kuchipudi is one of the 8 classical dance forms of India.**

➤ People learned this classical dance from generations through the **Guru-Shishya Parampara** tradition.

➤ Currently, this art form is in a declining-phase due to a **lack of patronage** from the government, also it **lost six gurus** in the pandemic years and **lack of future** for youths.

➤ Between 2014-18, the **Sangeet Natak Akademi** in collaboration with the Andhra Pradesh State government has archived the audio, video and photos of **Kuchipudi Yakshaganam**.

➤ **Guru Pasumarthy Rattaiah Sarma**, a doyen of Yakshaganas, is the oldest Guru living in the Kuchipudi village.

Kuchipudi (Andhra Pradesh)

Origin
Originated **in a village named Krishna district** in Andhra Pradesh.
Siddhendra Yogi systematized the **modern version in 17th century**
Lakshminarayan Shastry, in early 20th century, **brought in new practices** such as solo recitals and female participation.
Predominance of **Shringaara ras.**
Theme: Secular

Instruments
● Mridangam
● Cymbal
● Violin or veena

Group Performance
Involves **Nritta, Natya and Nritya.**
Kavutvams: Nritya (extensive acrobatics) and Nritta (pure dance)
Sollakath or Patakshara : Nritta part
Central Theme: Stories of **Bhagavat Purana.**
Dancers are known as **Bhagavathalus.**
Both **Lasya and Tandava** elements are important.

Solo Performance
Manduka Shabdam: Story of frog maiden.
Tarangam: The dancer performs with his/her feet on the edges of a brass plate and balancing a pot of water on the head or a set of diyas.
Jala Chitra Nritya: Dancer draws pictures on the floor with his or her toes while dancing.

Famous Proponents
● Radha Reddy
● Yamini
● Indrani Rehman
● Raja Reddy
● Krishnamurthy

Drishti IAS

Read more: Kuchipudi Dance Form.

Note:

India's Outward FDI Trends

India's **outward foreign direct investment** (OFDI) experienced a notable decline of **39%** to USD 28.64 billion in the fiscal year ending March 2024, reflecting the impact of uncertain global economic conditions.

➢ The decline is primarily attributed to reduced commitments in both **equity and loan routes.** The decrease in overseas acquisitions by Indian firms also played a role in this decline.

➢ However, March 2024 witnessed a surge in **outward FDI**, reaching USD 3.92 billion, with equity commitments at USD 2.03 billion, the highest for the year.

    ❍ This rebound indicates potential opportunities emerging amidst the challenging global economic landscape, highlighting the dynamic nature of India's outward FDI trends.

➢ **Outward direct investment** is a business strategy where a company based in one country (home country) invests in a business entity (foreign affiliate) located in another country (host country).

    ❍ This investment goes beyond simply buying stocks or bonds; **it involves establishing a controlling interest** or significant influence in the foreign company.

FDI and FPI

Foreign Direct Investment (FDI)

About:
- Investment made by foreign entities/individuals in businesses and assets located in a different country

FDI Routes:
- Automatic Route:
  - No prior government approval required
  - Up to 100% allowed in non-critical sectors
- Government Approval:
  - Necessary in certain sectors or for investments above specific thresholds
  - Administered by Department for Promotion of Industry and Internal Trade (DPIIT) and RBI

Examples of Approval via Auto and Govt Route:
- Banking (Private sector): up to 49% (auto) + above 49% and up to 74% (Govt)
- Defence: up to 74% (auto) + above 74% (Govt)
- Healthcare (Brownfield): up to 74% (auto) + above 74% (Govt)
- Telecom Services: up to 49% (auto) + above 49% (Govt)

Foreign Investment Promotion Board (FIPB):
- Comes under Ministry of Finance
- Responsible for processing FDI proposals – facilitated by Foreign Investment Facilitation Portal (FIFP)
- Making recommendations for Government approval

Govt's prior approval is mandatory for FDIs from countries sharing land border with India (China, Bangladesh, Pakistan, Bhutan, Nepal, Myanmar and Afghanistan)

India's Top 5 FDI Sources (FY 2022-23):
- Mauritius
- Singapore
- USA
- Netherland
- Japan

India's Top Sectors Attracting FDI (FY 2022-23):
- Services Sector
- Computer Software & Hardware
- Trading
- Telecommunications
- Automobile Industry

Foreign Portfolio Investment (FPI)

About:
- Investments made by foreign individuals, institutions, or funds in financial assets
- Known as Fly by Night or Hot Money

Imp Features:
- Purchase of financial assets occur without gaining ownership
- Passive investment approach
- Investors earn returns through dividends, interest, and capital appreciation

Example:
- Stocks, Bonds etc.

Regulatory Body:
- Securities and Exchange Board of India (SEBI)

Difference between FDI and FPI		
Features	**FDI**	**FPI**
Nature of Investment	Long-term	Short-term
Objective	Long-term presence in a foreign country	Earning quick returns on investments
Control	Significant (over the invested entity)	No or limited control
Investments in	Tangible assets (e.g., factories, buildings)	Financial assets (e.g., stocks, bonds)
Returns	Profits, Dividends, and Capital appreciation	Dividends, Interest, and Capital appreciation
Policy Regulations	Govt policies and sector-specific regulations	Flexible regulations and easier entry/exit
Impact on Economy	Job creation, technology transfer, and economic growth	Short-term liquidity and impact on stock market performance

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Read more: India's Outward and Inward Investment Trends

Note:

Raja Ravi Varma's Indulekha

Recently, amidst celebrations marking the **176th birth anniversary of renowned artist Raja Ravi Varma (29th April 1848),** the unveiling of the first true copy of his iconic painting **"Indulekha"** is set to take place at Kilimanoor Palace, Travancore, the artist's birthplace.

Note:

- Indulekha, a portrayal of the protagonist from *O. Chandu Menon's seminal Malayalam novel,* holds cultural and literary significance as a symbol of early modern literature in the region.
  - The unreleased painting of Indulekha garnered attention upon its emergence into the public domain in 2022.
- Raja Ravi Varma is considered the **father of modern Indian art,** as he combined **Indian iconography with Western realism.** His influence is seen in diverse fields such as art, literature, advertising, textiles, and comic books.
- Raja Ravi Varma, born into an aristocratic family in Kerala, started his professional art career at 22 and mastered **oil painting**.
  - Varma was **among the first Indian artists to use oil paints** and is considered a **representative of the Europeanised school of painting in India.**
- Varma built his reputation through royal patronage, he received significant commissions from **Maharana Fateh Singh and Sayajirao Gaekwad III.**
- **Works:** Damayanti Talking to a Swan, Shakuntala Looking for Dushyanta, Nair Lady Adorning Her Hair, and Shantanu and Matsyagandha.
- **Recognition: Kaiser-i-Hind Gold Medal** by the British colonial government in 1904 and in 2013, a crater on the planet Mercury was named in his honour.

  Read more: Raja Ravi Varma

India's Forex Reserves Drop

India's **forex reserves** fell by USD 2.282 billion to USD 640.334 billion in the week ending 19th April 2024, as per the **Reserve Bank of India (RBI).**

- **Components of Reserves:**
  - **Foreign currency assets** decreased by USD 3.793 billion to USD 560.86 billion.
  - **Gold reserves** increased by USD 1.01 billion to USD 56.808 billion.
  - **Special Drawing Rights (SDRs)** decreased by USD 43 million to USD 18.034 billion.

- Reserve position with the **International Monetary Fund (IMF)** declined by USD 2 million to USD 4.631 billion.
- **Factors Influencing Decline:**
  - This decrease was primarily attributed to strategic interventions by the **central bank,** which deployed the **reserves to defend the rupee** amidst economic uncertainties and currency depreciation.
  - The RBI intervenes in the market to **manage liquidity, including selling dollars** to prevent sharp **rupee depreciation** and prevent excessive volatility in the exchange rate.
- It can be noted that in April 2024, India's forex kitty had reached an all-time high of USD 645.6 billion.

  Read more: Decline in Forex Reserves

Miyawaki Method

Recently, the **Embassy of Israel** in India, in collaboration with a non-profit entity, has officially joined the **'Million Miyawaki'** project as a part of **the Earth Day** celebration.

- Under this project, efforts are made at planting a million trees in Delhi-NCR by creating 'forest-like' **Miyawaki plantations** of 600 trees each, with a variety of up to 30 different locally sourced species like **Anjan, Amala, Bel, Arjun and Gunj**.
  - It was named after Japanese botanist **Akira Miyawaki,** this method involves planting **two to four different types of indigenous trees** within every square meter.
  - This **method rapidly increases green cover on small plots** by promoting **self-sustaining tree growth** to full maturity within three years, eliminating the need for regular maintenance.
- The dense green cover of indigenous trees plays a key role in **absorbing the dust particles** of the area where the garden has been set up. The plants also help in **regulating surface temperature.**
- **Earth Day** is celebrated on 22nd April every year as an international event around the world to pledge support for environmental protection.

Note:

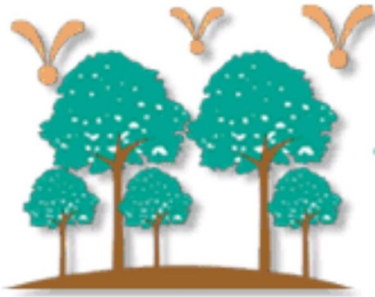**The Miyawaki method for restoring tropical forests**

Germinate the seeds in a nursery, When two to three leaves have sprouted, move the seedlings to pots, Cultivate the seedlings in ports until their root groups generally fill the containers,
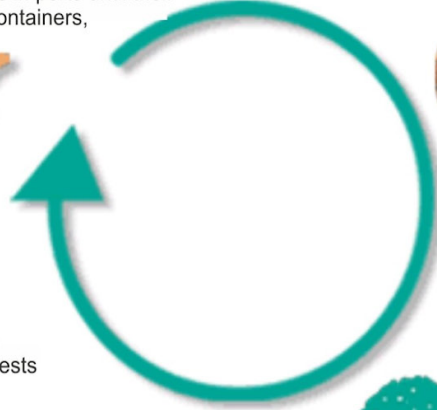
Cultivate under nets designed to cut out 60 percent of the sunlight for one to two months

Obtain seeds from natural tropical forests

Cultivate under nets designed to cut out 40 percent of the sunlight for one to two months.

"No management is best management"

Plant and conduct maintenance for one to two years, From the third year entrust the trees to natural management At this point the rule is "No management is the best management"

Adapt to the natural environment in an existing forest (period of between one week and one month).

Read More: Miyawaki Plantation Method

Exoskeleton Technology

Bengaluru hosted the inaugural international workshop on **'Emerging Technologies & Challenges for Exoskeleton'** organised by the **Defence Research & Development Organisation (DRDO)** on 15th April 2024.

➢ Exoskeletons are **wearable devices** designed to **facilitate fundamental human actions** and used in a diverse range of fields such as **Medical**, **Military**, **Rescue**, **operations, Industrial** and **Consumer uses.**

❍ In the medical field, these are used in **occupational therapy, augmentation and rehabilitation medicine** to help people who have suffered some kind of accident and need to walk or function normally again.

● **Paediatric exoskeletons** are designed for children with mobility problems, such as those affected by spinal muscular atrophy (SMA), Spinal cord injuries, Cerebral palsy, Muscle atrophy and Muscular dystrophy.

❍ There are numerous **industrial applications**, including assisting workers who undertake repetitive tasks such as paint spraying, welding, assembly line material handling etc.

❍ Exoskeletons are used in the **military**, as they help to reduce the physical burden on soldiers, and augment their strength for walking long distances.

❍ They can be used to help pre-fighters and other **rescue** workers survive dangerous environments.

Read More: Policy Watch: Robotics and Automation in India

Note:

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Bogota's Water Rationing Crisis

Bogota (capital of Colombia) recently commenced water rationing due to dwindling reservoir levels.

➢ The crisis underscores the critical need for prioritising land management and adapting to evolving climate realities.

➢ While the recent El Nino phase's impact has strained resources, including **potable water and energy,** collaborative measures and conservation remain imperative to mitigate future risks and ensure sustainable resource management.

➢ Bogota is one of the highest capital cities in the world located on a plateau in the Andes known as the **Altiplano Cundiboyacense.**

Note:

Padta Bet

Archaeologists from Kerala University have recently discovered a **5,200-year-old Harappan settlement at Padta Bet.**

➢ It is located approximately 1.5 km from **Juna Khatiya, an Early Harappan necropolis**, in the Kutch district of Gujarat.

About Juna Khatiya:

➢ It is **one of the biggest Harappan burial sites** with the possibility of 500 graves.

➢ The burials discovered at this site date **from 3,200 BCE to 2,600 BCE,** predating Dholavira and several other Harappan sites in Gujarat.

➢ The site is important because others like**Dholavira**have a cemetery in and around the town, but no major habitation has been discovered near Juna Khatiya.

Read more: Indus Valley Civilization

Dragon's Egg Nebula

Astronomers have been puzzled by a **nebula,** nicknamed the **Dragon's Egg,** which comprises a **cloud of gas and dust** enveloping a **binary star system.**

➢ The Dragon's Egg Nebula formed due to the **intense stellar winds emitted by a massive, hot central star.**

➢ One of the stars in the pair of binary stars **has a magnetic field, while the other does not,** which is unusual for massive stars.

➢ The magnetic star is about **30 times** more massive than the Sun, while its companion is about **26.5 times** more massive than the Sun.

➢ The researchers believe the system started as a **triple star system about 4-6 million** years ago.

➢ The merger of the two innermost stars **ejected gas and dust into space**, forming the **nebula around 7,500 years ago.**

➢ The nebula contains an unusually **large amount of nitrogen** due to the merger.

Read more: Star Formation in Dwarf Galaxies

IHRC Adopts a New Logo and Motto

Recently, the **Indian Historical Records Commission (IHRC)** has adopted a new logo and motto.

➢ **Logo**: The logo shape resembles **lotus petals**, the **Sarnath pillar** in the middle of the logo represents India's ancient past, while the brown color theme emphasizes IHRC's mission of preserving, studying, and honoring India's historical records.

➢ **Motto**: **"Where history is preserved for the future,"** reflects the IHRC's commitment to identifying, collecting, cataloging, and safeguarding historical documents and manuscripts for present and future generations.

➢ The IHRC was established in **1919** and is **headed by the Union Minister of Culture,** serving as an all-India forum for creators, custodians, and users of historical records.

SC Allows Abortion of 30-Week Foetus

The **Supreme Court of India** allowed a minor sexual assault victim to **terminate her pregnancy at nearly 30 weeks**, citing exceptional circumstances to protect her well-being.

➢ The **MTP Act, 1971,** amended in 2021 provides guidelines for terminating pregnancies under specific circumstances:

Note:

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Time Since Conception	MTP Act, 1971	MTP (Amendment) Act, 2021
Up to 12 weeks	On the advice of one doctor	On advice of one doctor
12 to 20 weeks	On advice of two doctors	On advice of one doctor
20 to 24 weeks	Not allowed	On advice of two doctors for special categories of pregnant women
More than 24 weeks	Not allowed	On advice of medical board in case of substantial fetal abnormality
Any time during the pregnancy	On advice of one doctor, if immediately necessary to save pregnant woman's life	On advice of one doctor, if immediately necessary to save pregnant woman's life

➢ **Article 21 of the Indian Constitution** protects reproductive choices as part of personal liberty.

　　○ However, India's abortion laws are being questioned due to changes granting more authority to doctors after 20 weeks, favoring women's autonomy but raising debates about the **rights of the unborn**.

　　Read more: Abortion

Gold-Spewing Volcano of Antarctica

Recently a study found out that **Mount Erebus, in Antarctica**, expels pockets of gas containing roughly **80 grams of crystallised gold daily**, worth about USD 6,000.

➢ **Mount Erebus** and **Deception Island** are the only two **active volcanoes out of a total of 138,** present in **Antarctica.**

➢ The **wind carries this glittering treasure** for hundreds of miles, with traces detected as far as 621 miles away.

➢ It's been in a **constant state of eruption** since at least 1972, a fiery anomaly amidst the frozen continent.

➢ **Mount Erebus exhibits** a particular eruptive style known as **Strombolian eruptions**. These eruptions are characterised by **moderate intensity**, with bursts of gas and ash shooting skyward.

➢ Mount Erebus **hosts a lava lake** at its summit crater which is a rare phenomenon. This molten rock pool **remains unfrozen** at the surface due to specific conditions within the volcano.
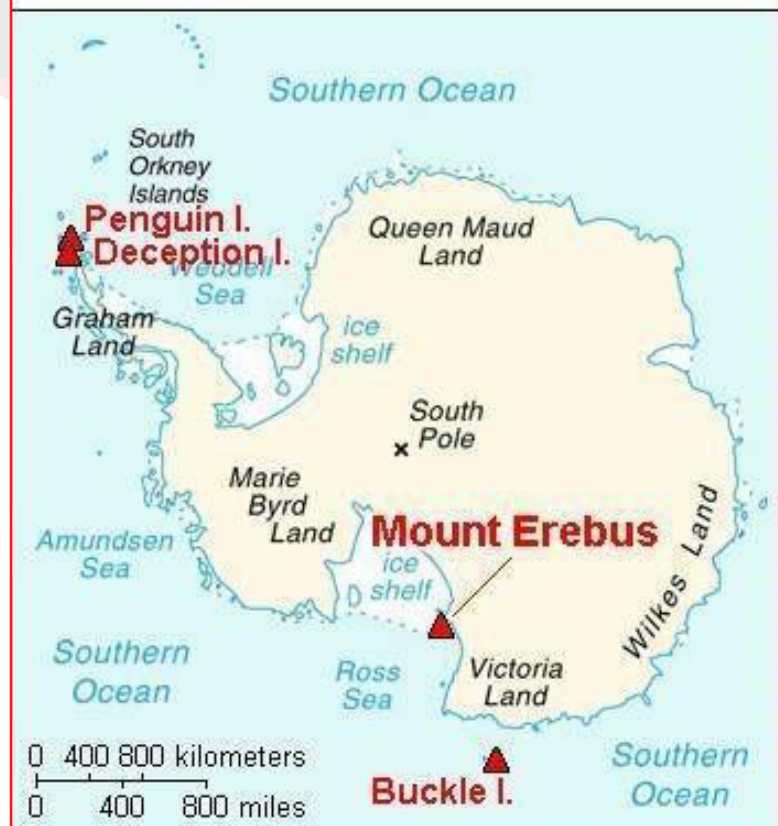
Read more: India's New Post Office in Antarctica

English Channel

Recently, 5 people died trying to cross the English Channel in a small boat on the backdrop of the **British parliament passing a controversial law** that would **permit the deportation of those seeking asylum in the U.K. to Rwanda.**

➢ According to the UK Government, the new law is needed as a deterrent to migrants and smuggling gangs.

English Channel:

➢ It is an **arm of the Atlantic Ocean** that **separates southern England from northern France.**

➢ It is **connected to the southern part of the North Sea** through the **Strait of Dover** at its northeastern tip.

➢ It is about **560 km long** and varies in **width from 240 km** at its widest to 34 km in the Strait of Dover. It is the **busiest shipping area** in the world.

➢ It was a **key factor** in Britain becoming a **naval superpower** and has been utilised by Britain as a **natural defence mechanism** and prevented invasions, such as the Napoleonic Wars and those of Adolf Hitler in **World War II**.

➢ The two dominant cultures are **English on the north shore** of the Channel, **and French on the south.**

➢ There is a **50.46-kilometreundersea railway tunnel** known as **Channel Tunnel**.

   ❍ It was **opened in 1994** and connects Folkestone (England) with Coquelles (France) beneath the English Channel at the Stof Dover.

Read more: UK's North Sea Drilling

Note:

Groundwater Recharge Challenges

A recent study estimated **groundwater recharge rates** in Australia using the **Chloride Mass Balance (CMB) method,** indicating that climate and vegetation significantly influence recharge rates.

➢ The CMB is a tracer technique that is used to **quantify the recharge rates for groundwater wells** in a dry environment using the **chloride content** of both precipitation and groundwater.

➢ Researchers state that the groundwater recharge rate is influenced by **climate and vegetation factors.**

 ○ Climate-related variables include rainfall distribution and evapotranspiration, while vegetation-related factors include the health and density of vegetation.

 ○ Soil properties and geographic variation also influence the rate of groundwater recharge.

➢ The study emphasised the importance of **considering changes in land-use patterns**, especially in rapidly urbanising areas, to increase groundwater recharge rates.

➢ In India's context, **Bengaluru's rapid urbanisation has led to a drastic reduction in green spaces and waterbodies**, with built-up areas increasing from 8% in 1973 to 93% in 2020. This has resulted in a severe**groundwater crisis,** with declining levels each year.

➢ In India, few studies estimate groundwater recharge rates using CMB, and large-scale analyses of chloride deposition are yet to be attempted.

 ○ The **Water Table Fluctuation (WTF)** method is common in India, estimating groundwater recharge by monitoring water level changes in wells.

➢ It is crucial for Indian cities to accurately estimate groundwater recharge rates and explore scientific measurement methods.

Read More: Protecting Our Groundwater: A Priority for a Sustainable Future, Bengaluru's Water Crisis: A Wake-Up Call for India

C-CAMP Joins BFI-Biome Virtual Network Program

The **Centre for Cellular and Molecular Platforms (C-CAMP)**partners with the **Blockchain for Impact (BFI) Biome Virtual Network Program** to advance healthcare solutions via biomedical innovation.

➢ The BFI-Biome Virtual Network Programme is an initiative to bring research institutes and incubators together to foster collaborations.

 ○ Through this programme, BFI will allocate over USD 2,00,000 over three years to develop technologies for accessible and affordable healthcare, leveraging C-CAMP's expertise.

➢ The C-CAMP is an initiative of the **Department of Biotechnology, Ministry of Science and Technology,** with a mandate to be an enabler of cutting-edge life science research and innovation.

➢ C-CAMP drives biomedical innovations in key areas like infectious disease diagnostics, **antimicrobial resistance,cell therapy**, **immuno-oncology**, **regenerative tissues,** and digital health technologies.

 ○ It also promotes entrepreneurship and innovation through seed funding schemes, mentorship programs, and bio-incubation facilities.

Read More: Synchronising AYUSH and Modern Medicine, Global Initiative on Digital Health

Infrastructure investment trust (InvIT)

IndoSpace, a developer of industrial and logistics parks in India, aims to launch an**infrastructure investment trust (InvIT)** to raise USD 700-800 million.

➢ This will be the biggest InvIT in India's industrial and logistics sector. IndoSpace owns **52 industrial logistics parks** in 11 cities of India.

Infrastructure Investment Trusts (InvIT):

➢ InvITs are instruments that work like**mutual funds.** They are **designed to pool small sums of money**

from a number of investors to **invest in assets** that give cash flow over a period of time. Part of this cash flow would be distributed as dividends back to investors.

➢ The minimum investment amount in an InvIT **Initial Public Offering (IPO)** is Rs 10 lakh, therefore, InvITs are **suitable for high net-worth individuals**, **institutional** and non-institutional investors.

  ○ Similar to stocks, **InvITs raise capital through IPOs** and are **then tradable on stock exchanges**. Examples of listed InvITs include **the IRB InvIT Fund** and **India Grid Trust.**

➢ InvITs are regulated by the **Securities and Exchange Board of India** (SEBI)**(Infrastructure Investment Trusts) Regulations, 2014.**

  Read more: Infrastructure investment trust (InvIT), Securities and Exchange Board of India

Next-Gen Sodium Batteries

Recently, scientists from South Korea have developed next-generation **sodium batteries capable of charging in just a few seconds.**

➢ These **new hybrid sodium-ion batteries** combine materials from traditional batteries with those used in **supercapacitors.**

  ○ These are **both cheaper and safer than the conventional lithium-ion batteries** found in smartphones and electric cars.

➢ **Sodium (Na) is also 500 times more abundant than lithium**, while holds the potential for greater charge and efficiency than its Li-ion batteries..

➢ Sodium-ion batteries haven't been widely adopted due to **drawbacks like slow charging and low energy storage.**

➢ **This new battery offers:**

  ○ Faster charging times than current lithium-ion batteries.

  ○ Higher energy density than commercial lithium-ion batteries (247 Wh/kg).

  ○ High power density (34,748 W/kg).

➢ Its potential applications include **electric vehicles** and **consumer electronics**.

  Read more: sodium-ion batteries

National Panchayati Raj Day 2024

The National Colloquium on "Governance at the Grassroots after Three Decades of the **73rd Constitutional Amendment"** was inaugurated in New Delhi to mark **National Panchayati Raj Day** 2024.

➢ The event will honour the best panchayats with awards for their efforts in improving the lives of rural households.

➢ The **Ministry of Panchayati Raj** in India observes **24th April as National Panchayati Raj Day each year.** The **73rd Amendment Act of 1992** which gave constitutional status to **Panchayati Raj Institutions (PRIs) and improved local self-governance in India** was enacted on this day.

➢ India's three-tiered (Gram Panchayat, Panchayat Samiti and Zila Parishad) administrative structure is known as the Panchayati Raj system, it aims to bring about improvement at the grassroots level in rural areas.

  ○ It is important for achieving inclusive growth and addressing issues like climate change and rural-to-urban migration

  Read more: National Panchayati Raj Day

India's Biggest Climate Clock

Recently, the **Council of Scientific &Industrial Research (CSIR)**, installed and activated **India's biggest Climate Clock** at the CSIR Headquarters in New Delhi as a part of the **Earth Day** Celebrations.

➢ The event signifies **CSIR's** aim to spread awareness about climate change and to make people **energy literate**.

➢ It was l**aunched in 2015** to provide a measuring stick against which **viewers can track climate change mitigation progress.**

Note:

- It is a graphic to demonstrate **how quickly the planet is approaching 1.5°C** of global warming, given current emissions trends. It also shows the **amount of CO_2 already emitted**, and the **global warming to date**.
- The date shown when humanity reaches 1.5°C will move closer as emissions rise, and further away as emissions decrease.
  - As of **4th April 2024**, the **current climate temperature is 1.295°C**.

  Read more: Earth Day

Youngest World Chess Champion

Recently, **D Gukesh** won the **International Chess Federation (FIDE) Candidates Chess Tournament 2024** in Toronto, Canada.

- He became the **youngest-ever challenger** to the **world title** and secured his place in chess history.
- Currently, **India has got 7 players in the top 20 junior rankings** and **a third of the top 30 juniors globally**.
- The **current world champion is Ding Liren**, who defeated his opponent Ian Nepomniachtchi in the **2023 World Chess Championship**.
  - **Magnus Carlsen**, the previous world champion, had declined to defend his title.
- **International Chess Federation (FIDE)**, has held the **Candidates Tournament** since 1950.
  - This prestigious event determines who gets to challenge the reigning World Chess Champion.
  - It used to be held **every three years** until 1992, but since 2013, it follows a two-year cycle.
- **FIDE** is the **governing body** of the sport of chess, and it regulates all international chess competitions.
  - It's constituted as a **non-governmental institution**. It **organizes** the **World Chess Championship.**

  Read more: FIDE Grand Swiss Open 2023

Dragonfly Rotorcraft Mission

Recently, NASA has confirmed the **Dragonfly rotorcraft mission** to **Saturn's moon, Titan.**

- Dragonfly is a **dual quadcopter,** resembling a **car-sized rotorcraft** that can cover tens of kilometres on Titan in under an hour.
- Due to Titan's hazy atmosphere, Dragonfly will use a **radioisotope power system,** similar to the **Curiosity rover on Mars**.
- Dragonfly will **fly to dozens of promising locations on Titan** looking for **prebiotic chemical** processes common on both **Titan and Earth.**
- This will be the first time **NASA** will fly a multi-rotor vehicle for science on other planets.
- The craft will land first at the **equatorial "Shangri-La" dune**, exploring the region in short trips before building up to **longer "leapfrog" flights of 8 kilometres.**
- Saturn is the **sixth planet from the Sun** and the **second-largest planet in the Solar System,** known for its distinctive ring system.
  - **Titan** is **Saturn's largest moon**, has an **earthlike cycle of liquids flowing across its surface**.
  - It is the **only moon with a thick atmosphere.**

  Read More: Dragonfly Mission

Euvichol-S

Recently, the new oral vaccine for cholera **Euvichol-S,** received prequalification by **the World Health Organization (WHO).**

- It is **third inactivated oral vaccine** to treat Cholera. The **other two** vaccines are **Euvichol and Euvichol-Plus**.
- Currently, **23 countries** are reporting cholera outbreaks with severe impacts seen in specific regions such as the **Comoros, Democratic Republic of the Congo, Ethiopia, Mozambique, Somalia, Zambia, and Zimbabwe.**
- Cholera, a **water-borne disease primarily caused by the** *bacteria Vibrio cholerae*.
  - Symptoms includes profuse **watery diarrhoea, Vomiting, Leg cramps.**
- Person may get cholera **by drinking water or eating food contaminated with the cholera bacterium.**
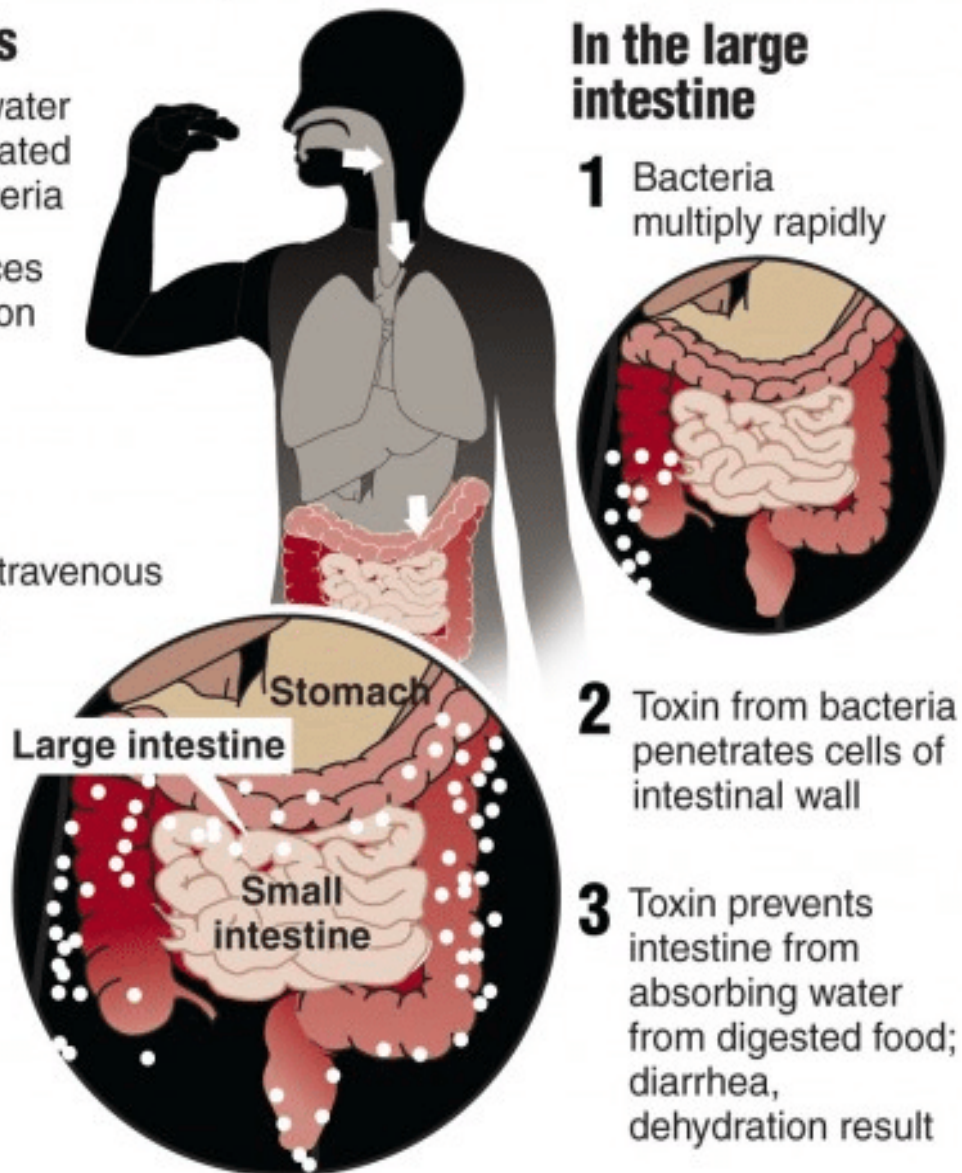
Note:

How cholera affects the body

Cholera is an acute intestinal infection that causes severe diarrhea, dehydration and, if not treated promptly, death.

How it spreads

• People ingest water or food contaminated with cholera bacteria

• In epidemic, feces of diseased person is source of contamination

Treatment

• Salt solution, intravenous fluids, antibiotics

• In unprepared communities, death rates can be as high as 50 percent

© 2010 MCT
Source: World Health Organization

In the large intestine

1 Bacteria multiply rapidly

2 Toxin from bacteria penetrates cells of intestinal wall

3 Toxin prevents intestine from absorbing water from digested food; diarrhea, dehydration result

Stomach
Large intestine
Small intestine

Read more : Cholera

Neptis Philyra

A rare butterfly species named *Neptis philyra* **(Nymphalidae family),** also known as the **long-streak sailor,** has been discovered for the first time in India at the **Tale Valley Wildlife Sanctuary (TWS),** Arunachal Pradesh by a team of butterfly enthusiasts.

Note:

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➢ Previously known to be found across various regions of East Asia, including eastern Siberia, Korea, Japan, and central and southwest China.
  ○ It has serrated wings with rich brownish-black on the upper side and yellow-brown on the underside.
  ○ It has a white cell streak on the forewing that forms a "hockey stick" pattern.
➢ The TWS is named after the **Tale Valley**, where the **wild onion "Tale"** is abundant. located in the Lower Subansiri District. The sanctuary is home to a variety of wildlife including the **elusive clouded leopard, Indian elephant, and rare orchid species.**
➢ The area is popular for bird and butterfly watching, and there is potential for ecotourism, especially focusing on cultural and scientific planning.

Read more: White Tufted Royal Butterfly, Clouded Leopards and Their Habitats

Star Campaigners of Political Parties

A political party recently designated a prominent figure closely associated with a Chief Minister as a **'star campaigner'** for its electoral activities in a different state.

➢ **Section 77 of the Representation of the People Act, 1951 (RP Act)** provides for law relating to expenditure incurred by 'leaders of a political party'.
  ○ These 'leaders of a political party' are popularly known as **'star campaigners'.**
  ○ The only requirement is that these persons have to be members of the political party that appoints them.
➢ The RP Act provides that a recognised political party (national or State) can appoint a maximum of **40 star campaigners** while a registered unrecognised political party can appoint up to **20.**

○ The names of the star campaigners are to be communicated to the **Election Commission (EC)** and **Chief Electoral Officer (CEO)** of the States as applicable within 7 days from the date of notification of such election.
➢ The **expenses for travel by them during campaigning are not counted towards a candidate's election expenditure limit.**
  ○ However, this exemption applies only if the star campaigners engage in general campaigning for the party.
  ○ If they specifically campaign for candidates or share platforms with them, the expenses are attributed to the candidate's expenditure.

Read more: Star Campaigners and Model Code of Conduct

Verification Mechanism in RoDTEP Scheme

The government is setting up a system to verify that only taxes paid on materials used (input duties) are refunded under the **RoDTEP scheme**.

➢ The **US and EU imposed anti-subsidy duties** on some Indian exports even though the **Remission of Duties and Taxes on Exported Products (RoDTEP)** scheme aims to reimburse input taxes.
➢ This happened because **Indian exporters couldn't demonstrate** the connection between the RoDTEP benefits received and the input taxes clearly during inspections by the US and EU.
➢ According to the government, the new verification process is through a **team consisting of officials** from the Department of Revenue and the **Directorate General of Foreign Trade.**
➢ It will address this issue by **randomly checking manufacturers and ensuring proper documentation** to prove RoDTEP payments are legitimate tax refunds, not subsidies.
➢ In January 2021, India switched from the **Merchandise Export from India Scheme (MEIS)** to the RoDTEP scheme. This change came about because MEIS faced criticism from other **World Trade Organisation (WTO)** member countries.
  ○ They argued that MEIS didn't clearly show how the amount of money paid to exporters was connected to the taxes they paid on materials used in production.

Note:

Extending Support

Refund of Duties and **Taxes on Exported Products (RoDTEP)** scheme implemented from Jan 1, 2021

Offers **0.3-4.3% incentive** to **8,555** products in sectors such as marine, agri, and gems & jewellery

But excludes pharma, steel and chemicals

Commerce ministry will need additional **₹2,000 cr** to expand coverage under scheme

Chemical sector eyes a remission rate of **2.3-2.9%**

Pharma industry seeks 5-6%

It's a crucial move as India's Sept. exports shrank 3.5% on weak global demand

Read more: **RoDTEP scheme, Foreign Trade Policy 2023**

Myanmar's Karen Ethnic Minority

Recently, **Myanmar's Karen ethnic minority** asserted their proximity to capturing a significant **Myawaddy trading town adjacent to the Thailand border.**

➤ The Karen ethnic minority, **indigenous to the Thailand-Burma border** region in Southeast Asia, predominantly resides in the **Karen State of Myanmar.**

➤ Their **origin** is believed to have roots tracing back to the **Gobi Desert in Mongolia.**

➤ Myawaddy is Myanmar's **most active trading post** with Thailand and its fall would have significant **economic implications.**

➤ The **Karen National Union (KNU)** is the **political organisation** representing the Karen people and has an **armed wing, the Karen National Liberation Army.**

➤ The conflict in Myanmar began after the **army ousted the elected government of Aung San Suu Kyi in 2021** and suppressed widespread nonviolent protests.

➤ **Myawaddyy** is a trading town in Myanmar that **connects with Mae Sot in Thailand.** These are the endpoints of the **India-Myanmar- Trilateral Highway.**

Read more: **INDIA-MYANMAR RELATIONSHIP**

Note:

Women Navy Officers on Transoceanic Expeditions

Recently, the Indian Naval Sailing Vessel **INSV Tarini** returned to her **base port at Goa** after a **historic transoceanic expedition** of nearly two months by **two women officers** of the **Indian Navy.**

➤ The journey included interactions with Mauritian officials and a **training sortie** with the **Mauritius Coast Guard**, strengthening ties between the two nations.

➤ This accomplishment signifies the Indian Navy's dedication to **gender equality** and empowering women in maritime roles.

➤ The officers are now preparing for their next adventure – **a global circumnavigation expedition called Sagar Parikrama-IV**, scheduled for September 2024 aboard INSV Tarini.

INSV Tarini:

➤ It is the **second sailboat of the Indian Navy** after INSV Mhedi.

➤ It is known for **circumnavigating the globe** with an all-women officer crew in the historic expedition titled **'Navika Sagar Parikrama' in 2017**.
   Read more: Sagar Parikrama-IV

India Delivers BrahMos Missiles to Philippines

Recently, India delivered **BrahMos supersonic cruise missiles** to the **Philippines**. India is looking at further **expanding defense ties** with the Philippines against the backdrop of growing global concerns over **China's increasing military assertiveness** in the **South China Sea**.

Brahmos Missiles:

➤ The **BrahMos missile**, an **Indo-Russian joint venture**, has a **range of 290 km** and is the **fastest cruise missile** in the world with a top speed of Mach 2.8 (nearly three times the speed of sound).
   ○ BrahMos is named for the **rivers Brahmaputra (India) and Moskva (Russia)**.

➤ It is a **two-stage missile (solid propellant engine in the first stage** and **liquid ramjet in the second stage)**.

➤ It is a **multiplatform missile** i.e., it can be launched from **land, air, and sea** and **multi-capability missile** with pinpoint accuracy that works **both day and night** irrespective of the weather conditions.

➤ It operates on the **"Fire and Forgets" principle** i.e. it does not require further guidance after launch.

➤ **Vietnam, UAE, and Indonesia** are among other potential customers of Brahmos missile.
   Read more: BrahMos Missiles, South China Sea

Geofencing

The **Election Commission of India (ECI)**'s website has been blocked outside India for months for security reasons.

➤ The geofenced sites include the ECI's Home Page, its Voter registration portal, and its Right to Information portal.

➤ But, the results portal, which reports the outcome of all polls the ECI administers, remains accessible.

Geofencing:

➤ **Geofencing** means "**security by obscurity**" measure, which allows those running websites **to evade the most direct forms of cyber attacks from abroad** by being fully inaccessible.

➤ Geofencing makes search engines less effective at indexing searched pages and turning them up in results.

➤ On the other side, good-faith security researchers are also prevented from flagging vulnerabilities while probing sites from abroad.
   Read more: Geo Fencing System.

Archaeological Sites Discovered in Telangana

Recently, three new archaeological sites were discovered in Telangana by a team of archaeologists led by Prof. K.P. Rao.

➤ A unique **Iron Age megalithic site** having **over 200 monuments** with a new type of megalithic monument known as **'Dolmenoid Cists',** not found elsewhere in India.
   ○ It was found at place called Ooragutta near Bandala village, **Telangana**.

➤ These "Dolmenoid cists" have **capstones** that **determine the shape of the monument,** unlike the usual square or rectangular forms.
   ○ The monuments are estimated to be around 1,000 BCE.

➤ It was suggested that these might be an **earlier form** of the **more common square/rectangular megaliths** seen in India and similar to **European Passage Chambers**.

➤ The team also discovered **two new rock art sites** at Damaratogu village.

Note:

- It includes the site, **"Devarlabanda Mula"** featuring **animal depictions without humans or weapons/domestic animals.**
  - This suggests the paintings might be from the **Mesolithic Age** (8000-3000 BCE).
  - **Read more:** **Mesolithic Age, Megalithic site**

Lake Kariba of Africa

Recently, the **El Nino Weather pattern** has induced **droughts and heatwaves in the Zambezi region**, leading to a drop in water levels at **Lake Kariba.**

- **Kariba Dam** is located in the Zambezi River basin between **Zambia and Zimbabwe**.
- It is the **world's largest man-made lake and reservoir by volume.**
- It lies **approximately 1300 kilometres upstream from the Indian Ocean.** It is **200 kilometres downstream of Victoria Falls on the Zambezi River.**
- It provides considerable **electric power to both Zambia and Zimbabwe and supports a thriving commercial fishing industry in Africa.**

Read more: Lake Victoria, Important Lakes in India

Note:

Chennai's Veeranam Lake

According to data from the **Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB), Veeranam Lake,** a primary water source for Chennai **has dried up.**

➢ Veeranam Lake, a **vital water source** for Chennai, **lies in Tamil Nadu's Cuddalore district.**

➢ It was regarded as **one of the longest man-made lakes** in the world with a length of 14 km.

➢ The **source** of Veeranam is the **river of Kollidam,** which is the **Northern distributary of the Cauvery River,** where the **Vadavaru River** links both the **Veeranam and Kollidam.**

  ○ It was built **between 907-955 AD by Chola Prince Rajaditya Chola.**

  ○ He named this waterbody after **his father's title-Veeranarayanan.**

➢ It features in the historical novel **"Ponniyin Selvan" by Kalki.**

READY RESERVOIR

Veeranam Capacity **1,465mcft**

Distance between Veeranam lake to Chennai **235km**

CAPACITY OF FOUR RESERVOIRS SUPPLYING WATER TO CHENNAI

Poondi: **3,231mcft**

Redhills (Puzhal): **3,300mcft**

Cholavaram: **881mcft**

Chembarambakkam: **3,645mcft**

■ Four reservoirs – Poondi, Cholavaram, Red Hills (Puzhal) and Chembarambakkam near Chennai city

■ The water from Veeranam lake is treated at Vadakuthu Water Treatment Plant (WTP) by pumping raw water at a distance of 20km from Sethiathope to Vadakuthu through 1775 mm dia mild steel pipe.

■ The treated water is then pumped to a distance of 8 km to Break Pressure Tank (BPT) at Kadampuliyur through 1750 mm dia mild steel pipe and from there the water is conveyed to a distance of about 200km through the mild steel pipe of 1875 mm and 1500 mm dia by gravity to Porur Water Distribution Station near Chennai.

■ From this Distribution Station, water is pumped to a distance of 1.2 km and distributed to Chennai City through Trunk mains and Water Distribution Stations.

Read more: Vembanad, Drought in East Flowing Rivers

Hokkaido, Japan's Garden of Gods

Recently, a record-high temperature o**f 26 degrees Celsius in Sapporo, Hokkaido** was recorded by the **Japanese Meteorological Agency.**

➢ Hokkaido's climate **is sub-arctic,with an annual average temperature of 8°C** and an average **annual precipitation of 1,150 mm.**

Note:

➢ Hokkaido is the northernmost of the four main islands of Japan **(Hokkaido, Honshu, Shikoku, and Kyushu).**

➢ It is bordered by the **Sea of Japan (East Sea) to the west,** the **Sea of Okhotsk to the north, and the Pacific Ocean to the east and south.**

➢ **Sapporo is i**n the **southwest on the Ishikari River,** is the administrative headquarters.

➢ The temperature change has implications for Hokkaido's status as Japan's last wild frontier and its traditional identity as the '**Garden of the Gods**' **for the Ainu people (Indigenous people).**

Note:

Goldene

Recently, researchers in Sweden have created **'Goldene' – a single-atom layer** of gold that can be used in a variety of applications like **hydrogen production, and water purification, production of value-added chemicals**, communication, and much more.

➢ They used a modified version of **Murakami's reagent**, inspired by an **ancient Japanese smithing** (forging art) **technique,** to selectively remove carbon in darkness and prevent cyanide formation, which dissolves gold.

➢ The researchers used a **three-dimensional base** material where gold is embedded between layers of **titanium and carbon to create Goldene.**

   ❍ The manipulation of matter on atomic, molecular, and supramolecular scales, (about 1 to 100 nanometers) is termed as **Nanotechnology. One nanometer (nm) is one-billionth or (10^{-9}) of a meter.**

➢ This new form of gold has **different properties** than regular gold similar to the case of **graphene**.

   ❍ For example: **Gold is usually a metal, but if a single atom layer is thick gold can become a semiconductor instead.**
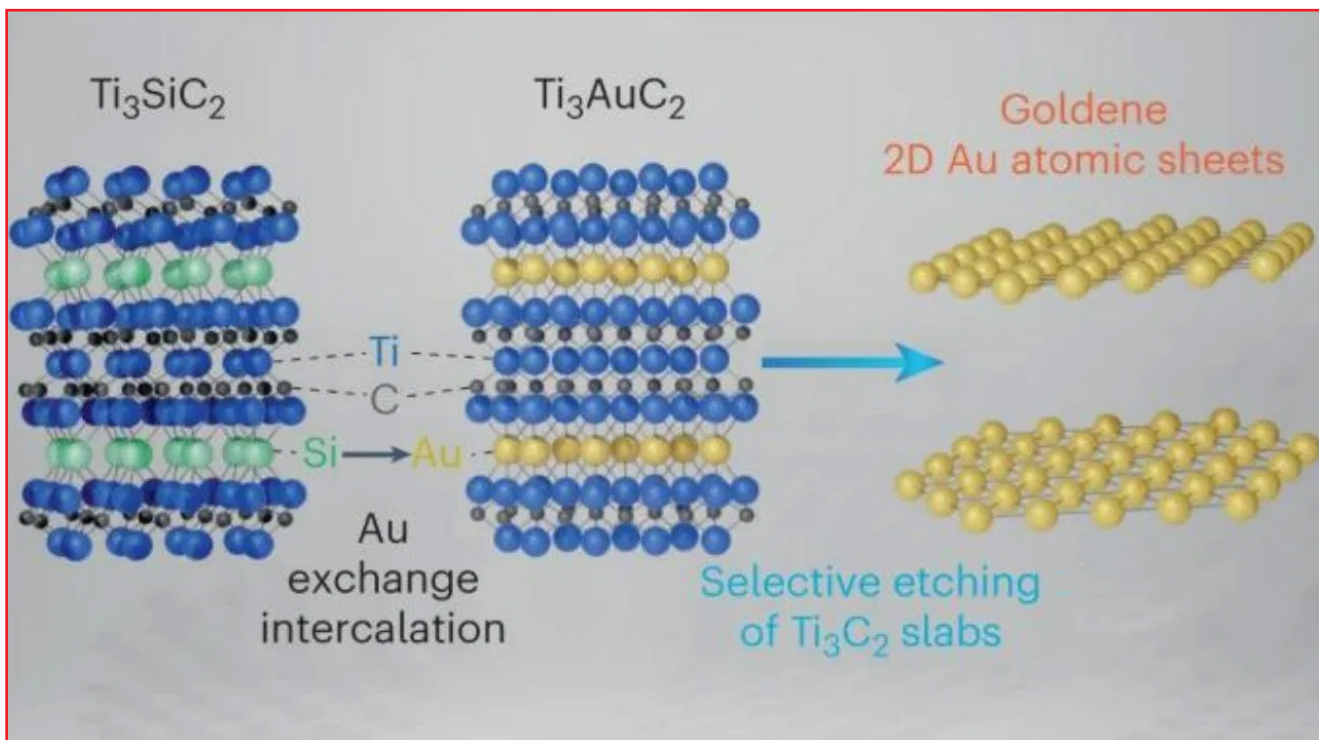
Read More: Nanotechnology

Infectious Respiratory Particles

The **World Health Organization (WHO)** has introduced a standardised term, **'infectious respiratory particles' (IRPs),** to describe pathogens transmitted through the air.

➢ This move aims to unify terminology across sectors, enhancing scientific and policy guidance while improving public communication regarding respiratory infections like **Covid-19**, Influenza, measles, **Middle East Respiratory Syndrome (MERS), Severe Acute Respiratory Syndrome (SARS)**, and **tuberculosis (TB).**

➢ The WHO's clarification distinguishes IRPs from previously used terms like **'aerosols' and 'droplets,'** emphasising a continuum of particle sizes.

Note:

Nifty Next 50 index

The **National Stock Exchange (NSE)** has announced the introduction of derivative contracts on the **Nifty Next 50 index,** set to commence from 24th April 2024.

➢ The Nifty Next 50 Index represents 50 companies from Nifty 100, excluding the **Nifty 50 companies.**
  ○ NSE has received approval from the **Securities and Exchange Board of India (SEBI)** for these derivative contracts.
➢ The exchange will provide three serial monthly index**futures and index options** contract cycles.
  ○ Contracts will be cash-settled and expire on the last Friday of the expiry month.
➢ Derivatives in the market refer to **financial contracts between two or more parties** and derive their value from an underlying asset or benchmark.
  ○ There are two main types of derivatives:
    ● **Futures,** which involve a binding agreement to buy or sell the underlying security on a future date.
    ● **Options,** which give the holder the right (but not the obligation) to buy or sell the underlying asset at a predetermined price within a specified period.
➢ The NSE is one of the two main stock exchanges in India, with the other being the **Bombay Stock Exchange (BSE).** It was the first exchange in India to provide modern, fully automated electronic trading.
  ○ NSE emerged as the **world's largest derivatives exchange in 2023,** in terms of the number of contracts traded, according to the **Futures Industry Association (FIA).**

Read more: Stock Market Regulation

Man Portable Anti-Tank Guided Missile

Recently, a **man-portable anti-tank guided missile (MPATGM)** weapon system, indigenously **designed and developed by the Defence Research and Development Organisation (DRDO)**has been field evaluated in different flight configurations several times.

➢ Anti-tank guided missile is a **medium or long-range missile** whose primary purpose is to **destroy tanks and other armoured vehicles.**
➢ It is a **low-weight, fire-and-forget missile**. It is incorporated with **state-of-the-art Miniaturized Infrared Imaging Seeker** along with **advanced avionics.**

➢ It is launched using a tripod designed for a **maximum range of 2.5 km** with a launch **weight of less than 15 Kg.** It can also be carried by a soldier's shoulder itself.
➢ The system consisted of the **MPATGM, Launcher, Target Acquisition System, and the Fire Control Unit.**
➢ The**ATGM system**is well-equipped with **day/night and top attack capability.**

Read more: **Akash-NG & MPATGM**

Russian Peacekeepers' Withdrawal from Nagorno-Karabakh

Russian peacekeepers have initiated their withdrawal from **Nagorno-Karabakh** following Azerbaijan's recapture of the disputed territory from Armenian separatists in September 2023.

➢ The decision for the withdrawal was agreed between Baku (Azerbaijan) and Moscow at the "highest levels."
➢ Nagorno-Karabakh, is a mountainous region in the **Caucasus (the transcontinental region between the Black Sea and the Caspian Sea),** internationally recognized as part of Azerbaijan but **predominantly inhabited by ethnic Armenians.**
  ○ The conflict began in the late 1980s when the region declared independence from Azerbaijan, leading to a war between Armenia and Azerbaijan.
  ○ A ceasefire in 1994 left Nagorno-Karabakh and surrounding areas under Armenian control, but frequent violations and failed negotiations followed.
  ○ In 2020, Azerbaijan won the Second Karabakh War, regaining control of seven surrounding districts and a third of Nagorno-Karabakh. **Russia brokered a peace deal and deployed peacekeepers** in the region.
➢ The conflict has strained relations between Russia and Armenia, as Moscow maintains warm ties with Baku.
  ○ Armenia announced that it has effectively suspended its participation in the **Moscow-led Collective Security Treaty Organisation (CSTO),** a defense alliance.

Note:

Read more: **Nagorno-Karabakh Conflict**

Kandukuri Veeresalingam

16th April was the birth anniversary of reformer Kandukuri Veeresalingam**.**

➢ **Kandukuri Veeresalingam (16th April 1848 – 27th May 1919) :**

❍ He was a **social reformer** and writer from the **Madras Presidency** of British India. He was influenced by the ideals of **Brahmo Samaj.**

❍ He is considered as the **father of the Telugu Renaissance movement**.

❍ He was one of the **early social reformers** who **encouraged the education of women** and the **remarriage of widows** (which was not supported by society during his time).

❍ He also **fought against child marriage and the dowry system**.

❍ He **started a school in Dowlaiswaram** in 1874.

❍ He constructed the **'Brahmo Mandir'** in 1887 and built the **'Hithakarini School'** in 1908 in **Andhra Pradesh**.

❍ His **novel Rajasekhara Charitramu** is considered to be the **first novel in Telugu literature**.

Kandukuri Veeresalingam
16 April 1848 – 27 May 1919

Father of the Telugu Renaissance Movement

Read More: **Socio-Religious Reform Movements Part:I , Part:II**

Note:

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NASA's Mars Sample Return Program

Recently, NASA's Perseverance Rover, nicknamed Percy, created the **first "sample depot on another world"** by putting down **ten rock sample tubes** that were supposed to be returned to Earth as part of the **Mars Sample Return Campaign**.

➢ However, the plan is **too expensive** costing $11 billion, and will only be executed by the **year 2040.**

➢ **Perseverance rover:**
- ❍ It is a **robotic explorer** part of NASA's Mars 2020 mission.
- ❍ Launched in July 2020, it **landed on Mars' Jezero Crater** in February 2021.
- ❍ It is a **Mars rover** about the size of a car but weighs only about **1,025 kilograms** with all instruments on board.
- ❍ It **collects rock and soil samples**, **encasing them in tubes** for a future return to Earth.
- ❍ A **Multi-Mission Radioisotope Thermoelectric Generator**, which uses heat from plutonium decay to generate electricity, acts as the power source for the rover.

Read more: Perseverance Rover, Mars

Environmental Movement in Indonesia

Religious leaders in **Indonesia** are responding to the threats posed by **rising sea levels** and extreme weather events by actively shaping the **environmental movement.**

➢ As the world's **largest exporter of coal and palm oil**, the country wields significant influence over the global **climate crisis.**

➢ The archipelago nation is vulnerable to rising sea levels and **extreme weather events**, while rural communities are affected by climate change-induced **droughts.**

➢ In 2007, during the **UN Climate Summit in Bali**, Indonesian religious leaders from diverse faiths presented an interfaith statement that emphasised the role of religious teachings and local wisdom in inspiring **grassroots action.**

➢ This growing trend in Indonesia is the emergence of **"Green Mosques"** and **"Green Churches."**

➢ To reduce the **ecological footprint** a number of other steps have also been taken such as:
- Installation of Solar Panels
- Implementing Water Recycling Systems
- Using Energy-Efficient Faucets

➢ **Indonesia** is also planning to **relocate its capital** from **Island of Jakarta to Borneo** due to severe congestion, **pollution**, and rapid sinking, which is projected to submerge a significant portion of the city by 2050.

Read more: Environmental Movements

Fourth Global Mass Coral Bleaching Event

Coral Reef Watch (CRW) of the United States and the International Coral Reef Initiative (ICRI) have confirmed the **fourth global mass coral bleaching** event in 2023-2024.

➢ This is the **second such event in the last 10 years** and comes at a time when global oceans have also recorded **unprecedented heat** in 2023 and 2024.

➢ The **El Nino conditions** in the equatorial Pacific Ocean **added** onto the general trend of **warming** over land and oceans.
- ❍ During El Niño events, warm ocean currents from the central and eastern Pacific Ocean move towards the western Pacific, causing sea surface temperatures to rise in many regions.

➢ Among long-term patterns, ocean heating and mass **coral bleaching** are closely tied to the occurrence of **El Nino events**.
- ❍ This warming effect of El Niño contributes to ocean heating, which stresses coral reefs.

➢ The various **factors responsible** for coral bleaching are **increasing sea surface temperatures, extensive marine heatwaves, ocean acidification and pollution.**

➢ When sea surface temperatures and ocean heat in general rise, the **algae on the hard corals die off**. This makes the corals white.

➢ This process is known as **'coralbleaching'**. Once bleached, the corals can become vulnerable to diseases and eventually die.

Note:

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Coral Reefs
(Rainforests of the seas)

Drishti IAS

About
- **Large underwater structures** — made of skeletons of **colonial marine invertebrates** 'coral' — individually called **polyp**
- **Symbiotic** Relationship with **algae** '**zooxanthellae**' (responsible for beautiful colours of corals)
- Support over 25% of marine biodiversity

Hard Corals vs Soft Corals
- **Hard Corals** - Rigid skeleton **made of $CaCO_3$ - reef-building** corals
- **Soft Corals** - Non reef-building

Great Barrier Reef (Australia)
- Largest Coral Reef in the World
- World Heritage Site (1981)
- Endures Mass Coral Bleaching

Corals in India
- Present in the areas of Gulf of Kutch, Gulf of Mannar, Andaman & Nicobar, Lakshadweep Islands and Malvan

Significance
- Coral reefs **protect coastlines from storms/erosion**, provide jobs, offer opportunities for recreation
- Source of **food/medicines**

Threats
- **Natural:** Temperature, Sediment Deposition, Salinity, pH, etc.
- **Anthropogenic:** Mining, Bottom Fishing, Tourism, pollution, etc.

Coral Bleaching
- Corals under stress - expel algae — thus turning white (bleached)
- Bleached corals - not dead — but, more risk of starvation/disease

Initiatives to Protect Corals

Technology
- Cyromesh: Storage of the coral larvae at (-196°C) - Can be later reintroduced to the wild
- Biorock: Creating artificial reefs on which coral can grow rapidly

Global
- International Coral Reef Initiative
- The Global Coral Reef R&D Accelerator Platform

Indian
National Coastal Mission Programme

Read more:

Note:

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TRAI Recommendations for Regulatory Sandbox

The **Telecom Regulatory Authority of India (TRAI)** has issued significant recommendations for customer onboarding and the oversight of the **Regulatory Sandbox (RS).**

➤ Eligibility for the RS in the Digital Communication Sector is **limited to Indian nationals** or entities, aiming to promote innovative technologies, services, use cases, and business models.

➤ Customer onboarding in the **RS requires specific voluntary consent,** emphasising ethical and legal customer engagement.

➤ Adherence to the **Digital Personal Data Protection Act, 2023,** is crucial for customer onboarding and data processing, highlighting the importance of **data protection laws and regulations.**

➤ Applicants must disclose details of licensing or regulatory relaxations sought for testing purposes and provide a clear exit strategy for the testing phase, ensuring transparency and regulatory compliance.

➤ The oversight and governance of the RS is recommended to be managed by the **National Telecommunications Institute for Policy Research, Innovation, and Training (NTIPRIT),** with involvement from the **Telecom Engineering Centre (TEC)** and academic institutions as needed.

➤ Funding support from **"Digital Bharat Nidhi"** is suggested for entities conducting trials for new technologies, aiming to bridge the digital divide and promote socio-economic advancement for underprivileged sections, aligning with broader national goals.

Read more: Comprehensive Framework for a Regulatory Sandbox

Starlink Project

Recently, several Starlink satellites were lost due to complex space weather phenomena like solar storms, which were launched by Elon Musk's SpaceX in February 2022.

Starlink Project:

➤ It is a **SpaceX project,** launched in 2019**,** to build a **broadband network** with a cluster of thousands of orbiting satellites.

➤ The **goal of the project** is to create a **low-cost, satellite-based broadband network** that can provide global internet access.

➤ The **Starlink satellites** will be placed in an **altitude range between 350 km and 1,200 km** in **Low Earth Orbit (LEO).**

  ○ **Reduced latency** between a user seeking data and the server transmitting that data is the key benefit of placing satellites in LEO for space-based Internet.

➤ **Solar Storms** happen when th Sun emits **large bursts of energy** in the form of **solar flares and coronal mass ejections**. These phenomena send a stream of electrical charges and magnetic fields toward the Earth at high speed.

  ○ One of the effects of a solar storm striking Earth is the creation of the **"Northern lights"** which are seen in the regions around the Arctic Circle. An adverse effect of solar storms is the **disruption of satellites** and other electronic means of communications.

Read More: **Space Internet, Geomagnetic Storm**

Operation Meghdoot

Recently, **Operation Meghdoot** has completed its 40th anniversary which resurfaces the achievements of the Indian Army and Indian Air Force (IAF), in the Siachen glacier to secure the heights dominating the Northern Ladakh region.

➤ The operation involved the airlifting of Indian Army soldiers and supplies by the IAF and dropping them on the Siachen glacier.

➤ The **Siachen Glacier** has been a bone of contention since the **Karachi Agreement** in July 1949. Later, during the 1980s, Pakistan started attempts to legitimise its claim on Siachen Glacier leading to Operation Meghdoot by India.

➤ Operation Meghdoot was launched on 13th April 1984, when the **Indian Army** and **Indian Air Force (IAF)** advanced to the Siachen glacier to secure the heights dominating the Northern Ladakh region.

➤ The operation resulted in India gaining 70 kilometres long Siachen Glacier and all of its tributary glaciers, as well as three main passes of the **Saltoro Ridge** namely **Sia La, Bilafond La, and Gyong La.**

Note:

Read More:Siachen Glacier, Karachi Agreement

CWG Stares at Uncertain Future

Recently, Malaysia rejected the offer to host the**Commonwealth Games (CWG)** citing **short notice and insufficient funds**.

➢ The **Commonwealth Games (CWG)**is a **quadrennial international** multi-sport event among athletes from the Commonwealth of Nations, which mostly consists of territories of the former British Empire.

Commonwealth Nations*:*

➢ The**Commonwealth** is a collective of **56 countries,primarily former British colonies**.
   ○ **Established in 1949** by the **London Declaration**.
   ○ Members are mainly situated in Africa, the Americas, Asia, and the Pacific, with notable emerging economies.
➢ It was created as the **British Commonwealth of Nations** through the **Balfour Declaration of 1926.**
➢ The **chief institutions** of the organisation are **Commonwealth Secretariat and Commonwealth Foundation which** focuses on **intergovernmental aspects** and **non-governmental relations** among member states respectively.
➢ The Commonwealth consists of **both Republics and Realms**.
   ○ The **British monarch is the Head of State for the realms**, whereas the republics are ruled by elected governments except in the case of five countries — Brunei Darussalam, Eswatini, Lesotho, Malaysia, and Tonga — each a self-governed monarchy.
   ○ The **realms** are Antigua and Barbuda, Australia, the Bahamas, Belize, Canada, Grenada, etc.
   Read more: Future of the Commonwealth

Ultrasonic Calls of Brazilian Leaf Litter Frogs

Researchers uncover a remarkable phenomenon in the **Brazilian rainforest** involving a tiny **leaf litter frog** emitting **ultrasonic calls** imperceptible to humans.

➢ **Leaf litter frogs *(Haddadus binotatus)*** in the Brazilian rainforest produce ultrasonic calls, **potentially to deter predators or attract other animals for protection.**

Note:

- The call's frequency ranges from 7 Kilohertz (kHz) to 20 kHz, within humans' hearing range, and up to 20 kHz to 44 kHz, beyond human perception.
  - The "normal" human hearing frequency range is between 20 Hz and 20 kHz.
- While inaudible to humans, these screams can be detected by potential predators like **bats, rodents, and small primates,** potentially deterring a range of predators with their broad frequency range.

➢ The discovery raises questions about the purpose of these ultrasonic calls and their impact on predators and the ecosystem.

Read more: Dancing Frogs

UNFPA State of World Population Report

The **United Nations Population Fund's (UNFPA)State of World Population - 2024** report revealed that **India's population is estimated to double in 77 years.**

➢ **Key Highlights:India leads globally with an estimated population of 1.44 billion,** followed by China at 1.425 billion.
  - India's population was recorded at 1.21 billion during the last census, conducted in 2011.
  - The report revealed that 24% were aged 0-14, 17% aged 10-19, and **26% aged 10-24.** 68% aged 15-64, and 7% aged 65 and above.
  - Men have a life expectancy of 71 years and women 74 years.
  - The report also highlighted that 30 years of India's progress in sexual and reproductive health has largely ignored the most marginalised communities globally. It noted that the **percentage of child marriage in India was at 23% between 2006-2023.**
  - **Maternal deaths** in India have significantly decreased, making up 8% of global maternal fatalities.

- The report highlights that Maternal mortality is high among indigenous groups. Women with disabilities are more vulnerable to **gender-based violence.**
  - Vulnerable groups face greater sexual and reproductive health risks, exacerbated by factors like **climate change** and **caste-based discrimination.**

Read more: State of World Population Report: UNFPA

Novel Hydrogel to Remove Microplastics

Indian Institute of Science (IISc) researchers have designed a **sustainable hydrogel to remove microplastics** from water, addressing their threat to human health and the environment.

➢ The hydrogel has a **three-layer polymer structure** and utilises nanoclusters of a material called **copper substitute polyoxometalate (Cu-POM)** as catalysts to **degrade microplastics using UV light irradiation.**

➢ The hydrogel was highly efficient, removing about 95% and 93% of two different types of microplastics in water at near-neutral pH (~6.5).

➢ A fluorescent dye is added to the microplastics to track adsorption and degradation by the hydrogel under different conditions.
  - The material was found to be stable under various temperatures, making it a promising solution for microplastic removal.

➢ Microplastics are defined as **plastics less than five millimetres in diameter,** they are created through the influence of natural factors like UV radiation, wind, and currents, breaking down larger plastics into small particles.
  - There are two categories: **primary microplastics**, which are tiny particles designed for commercial use, and microfibers shed from clothing and other textiles and **secondary microplastics**, formed from the breakdown of larger plastics such as water bottles.

Read more: Microplastics

Nigeria Leads with New Meningitis Vaccine

Nigeria has made history by being the **first country globally to introduce the Men5CV vaccine,** a groundbreaking step in combating **meningitis**.

➢ This new vaccine, endorsed by the**World Health Organization (WHO),** provides protection against **five strains of the** *meningococcus bacteria* in a single dose, surpassing previous vaccines that targeted fewer strains.

➢ With a recent surge in cases across the continent, the introduction of **Men5CV** aligns with **WHO's goal to eliminate meningitis by 2030.**

➢ **Meningitis is a serious infection of the meninges**, the membranes covering the brain and spinal cord.
- ○ The disease can be caused by many different pathogens including **bacteria, fungi or viruses,** but the highest global burden is seen with bacterial meningitis.
- ○ Several different bacteria can cause meningitis. *Streptococcus pneumoniae, Haemophilus influenzae, Neisseria meningitidis* are the most frequent ones.

Meningococcal meningitis

Information for mass gatherings

Source of infection

Meningococcal meningitis is a bacterial form of meningitis. It is a serious infection of the thin lining that surrounds the brain and spinal cord. It can cause severe brain damage and is fatal in 50% of cases if untreated. It can also cause wide-scale epidemics.

Types of

exposure & prevention

Meningitis spreads from one person to another by droplets from the nose and mouth when an infected person coughs, sneezes or talks. This happens especially when in close and prolonged contact with infected persons, as well as during mass gatherings.

Prevent it by:
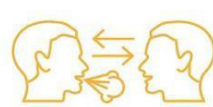
Getting vaccinated, especially before attending mass gatherings like hajj and umrah

Taking antibiotics when prescribed. When taken promptly, antibiotics can reduce transmission among close contacts. Ciprofloxacin should be given or Ceftriaxone as an alternative.

Wearing masks during mass gatherings to avoid respiratory transmission.

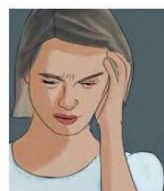# Symptoms

The most common symptoms of meningitis are:

Stiff neck   High fever   Sensitivity to light   Confusion   Headaches   Vomiting

Actions to take in case of symptoms: Seek medical advice and start any prescribed treatment immediatley. Early antibiotic treatment is critical in saving lives and reducing complications.

WHO-EM/CSR/609/E

Read more: Global Roadmap to Defeat Meningitis: WHO

Note:

Nostro and Vostro Accounts

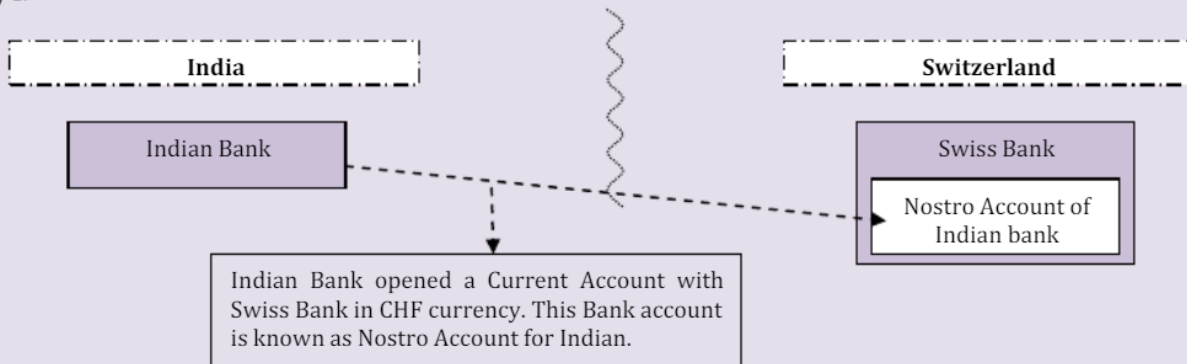Recently, the payment mechanism for traders importing pulses from Myanmar has been simplified by the government.

➢ The importers have been asked to utilise the Rupee/Kyat direct payment system using a **Special Rupee Vostro Account (SRVA)** through Punjab National Bank.

About Nostro/Vostro Account:

➢ A **Nostro account** is an **account held by a bank in another bank**. It allows the customers to deposit money in the bank's account in another bank.
   ❍ It is often used if a bank has no branches in a foreign country.
   ❍ Nostro is a Latin word that means "ours".
➢ A **Vostro account** is an account that a correspondent bank holds on behalf of another bank.
   ❍ Vostro is a Latin word that means "your".
➢ Nostro and Vostro accounts are held in a **foreign denomination.**
➢ Vostro accounts **enable domestic banks** to **provide international banking services** to clients with global banking needs.
➢ Vostro account services include **executing wire transfers, performing foreign exchange transactions**, enabling deposits and withdrawals, and expediting international trade.
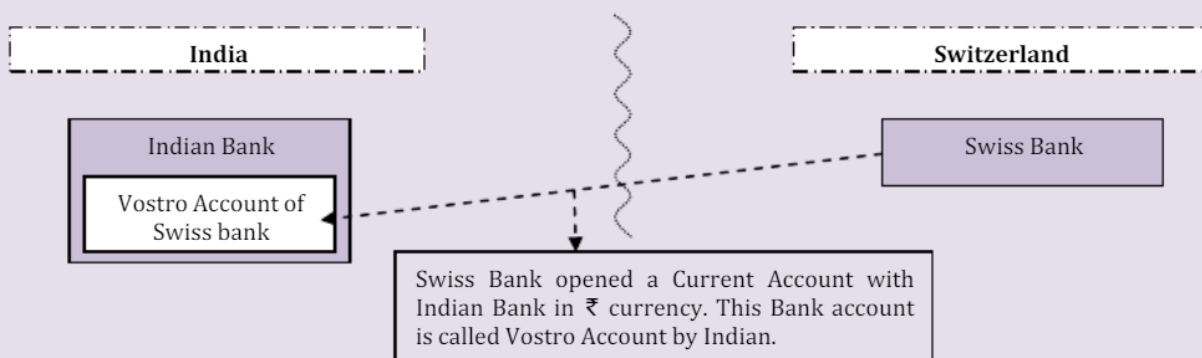
Nostro A/C: [Ours Account with You]

Nostro Account is a Current account maintained by a domestic bank/dealer with a foreign bank in foreign currency. For example, Current Account of SBI Bank (an Indian bank) with Swiss Bank in Swiss Franc (CHF) currency is a Nostro A/C.

India	Switzerland
Indian Bank	Swiss Bank
	Nostro Account of Indian bank

Indian Bank opened a Current Account with Swiss Bank in CHF currency. This Bank account is known as Nostro Account for Indian.

Vostro A/C: [Yours Account with us]

Vostro A/C is a Current account maintained by a foreign bank with domestic bank in Rupee currency. For example: Account of Swiss bank in India with SBI in Rupee (₹) Currency.

India	Switzerland
Indian Bank	Swiss Bank
Vostro Account of Swiss bank	

Swiss Bank opened a Current Account with Indian Bank in ₹ currency. This Bank account is called Vostro Account by Indian.

Read More: **Vostro account**

Note:

Thrissur Pooram

In a recent ruling, the Kerala **High Court** has issued directives to ensure the safety and well-being of elephants and artists during the **Thrissur Pooram festivities.**

➤ Thrissur Pooram is a grand celebration of **Kerala's cultural and spiritual essence.**

➤ Celebrated in the **Malayalam month of medam (April-May),** the pooram is held at the Thekkinkadu Maidanam in Thrissur and is considered the **mother of all poorams (annual festival).**

➤ It was started by **Raja Rama Varma, famously known as Sakthan Thampuran, the Maharaja of Cochin (1790–1805)**, with the participation of 10 different temples.

➤ Majestic elephants adorned in traditional attire and traditional orchestra music are part of the festival.

➤ The **Arattupuzha Pooram** was the biggest festival in Kerala before Thrissur Pooram.

Read more: Thrissur Pooram

Geroscience

Researchers have developed a **blood test** to **measure ageing pace** by **studying DNA methylation**.

➤ This **blood test investigates** how an enzyme adds methyl groups to DNA in older adults, revealing a **link between this process and aging.**

Geroscience:

➤ It refers to the **interdisciplinary field** focused on understanding the biological mechanisms of aging and age-related diseases**.**

Note:

➢ It involves studying various factors, including **DNA methylation**, enzyme activity (such as the **gerozyme (aging-associated enzyme)**), socio-economic influences, and lifestyle interventions like nutrition, exercise, and music therapy.

  ○ **DNA Methylation** is a process in which **methyl groups** (CH3) are added to the **DNA molecule**. It plays a crucial role in regulating **gene expression** and **maintaining genome stability**.

➢ It aims to develop strategies, such as drug interventions **targeting specific ageing-related processes**, to promote healthy aging and combat age-related conditions like **dementia.**
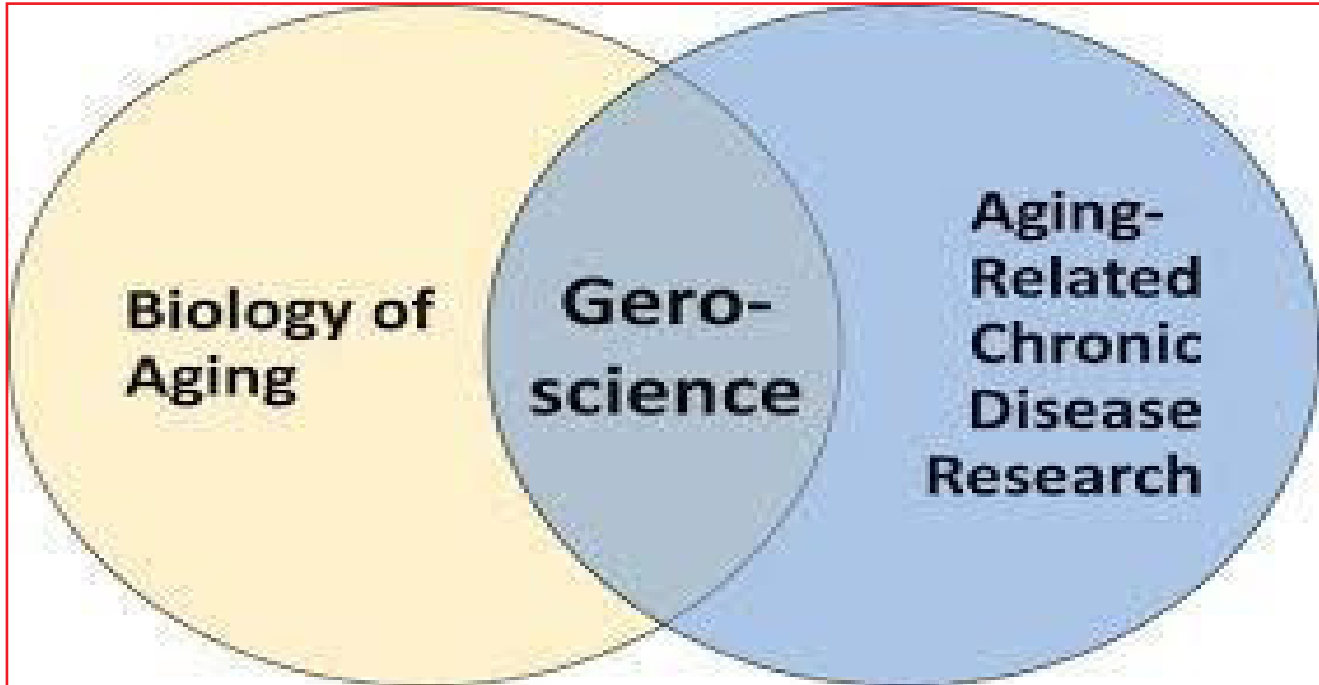
Read more: Genome India Project, India Ageing Report 2023

Baltimore Bridge (Francis Scott Key Bridge)

   Recently, a container vessel collided with the **Baltimore Bridge**, causing several parts to break and fall into the **Patapsco River.**

➢ It is named after **Francis Scott Key**, the writer of the **American national anthem (The Star-Spangled Banner)**.

➢ The ship deviated from the **standard route** under the **Bridge**, unlike large ships leaving the **Port**.

➢ The Bridge lacked redundancy and was **"fracture critical,"** meaning a failure in any member could lead to a **partial or complete collapse.**

  ○ **Baltimore** was the **17th biggest port** in the **United States** in 2021.

  ○ It is the **biggest vehicle-handling port** in the country, including cars and heavy farm equipment.

Patapsco River:

➢ The lower Patapsco River connects the Port of Baltimore to the Chesapeake Bay and the Atlantic Ocean.

➢ The Patapsco River mainstem is a 39-mile river in **central Maryland** that flows into the **Chesapeake Bay.**

➢ The river's tidal portion forms the harbour for the city of Baltimore.

Note:

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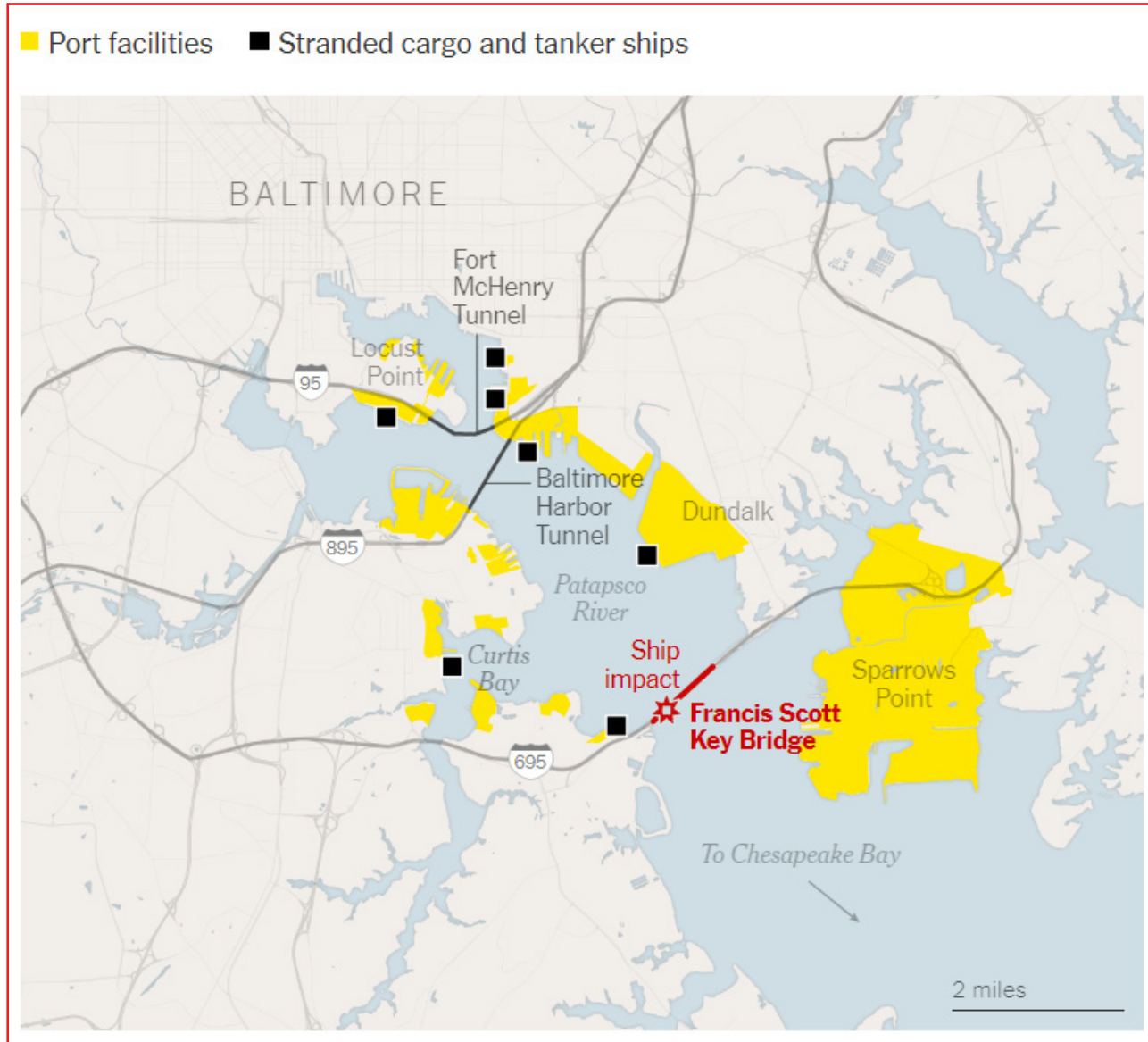
Read more: Major Ports in India

Erez Crossing

Israel has reopened the **Erez crossing** between Israel and northern Gaza for the first time since the October 7 **Hamas** attacks to allow more aid to **Gaza**.

➢ **Erez (or Beit Hanoon)** is located in the north of the **Gaza Strip.** It was the main crossing for the movement of people between Israel and Gaza.

➢ It is primarily a **pedestrian crossing** but can also be used for road supplies.

➢ Movement through all of Israel's crossings with Gaza was already **heavily restricted** before the war, as Israel imposed a blockade of the territory with Egypt 17 years ago.

➢ The only crossings currently operational are the **Rafah crossing** **with Egypt** and **Kerem Shalom with Israel**.

➢ Hamas is a **Palestinian political armed group** that was founded in 1987. It's a militant group that emerged as a resistance movement against Israeli occupation.

Note:

Read more: **Gaza Strip**, **Israel-Hamas Conflict and its Global Impact**, **Israel-Palestine Conflict**

Exercise DUSTLIK

The Indian Army contingent departed for the 5th edition of **India-Uzbekistan joint military Exercise DUSTLIK,** scheduled from 15th to 28th April 2024 in Termez, Uzbekistan.

➢ Exercise DUSTLIK is a **yearly event alternately conducted in India and Uzbekistan.**

   ❍ The exercise aims to **foster military cooperation**, enhance combined capabilities, focus on joint operations in mountainous and semi-urban terrain, develop interoperability, and enhance bilateral relations.

   ❍ This edition of Exercise DUSTLIK involves personnel from combat support arms and services, including two Women Officers.

➢ The first-ever exercise "Dustlik" between India and Uzbekistan was in 2019 which focused on **counter-terrorism.**

Read more: **DUSTLIK Exercise**

Mercenary Spyware Attack

Apple has recently issued urgent security alerts to **iPhone users** in India and 91 other countries. The notifications warn that their devices have been remotely targeted in a **mercenary spyware attack.**

➢ Mercenary spyware attacks are **exceptionally rare** and highly sophisticated compared to regular **cybercriminal activity** or consumer malware.

Note:

➢ Unlike common cyber threats, mercenary spyware aims to **gain unauthorised access** to a user's device.
  ○ If a device is compromised by a targeted mercenary spyware attack, the attacker may be able to **remotely access sensitive data**, communications, or even the camera and microphone.
  ○ These are **strategically aimed**, high-cost attacks, historically linked to states, targeting select individuals like journalists, activists, politicians, and diplomats.
  ○ **Pegasus, developed by the NSO Group** is one of the **examples** of Mercenary **Spyware.**

CYBER SECURITY

Cybersecurity refers to any technology, measure, or practice for preventing cyberattacks or mitigating their impact.

CYBER SECURITY ATTACKS

Man in The Middle Attack · Password Attacks · Brute Force Attack · Spyware and Keylogger · Cross-Site Scripting

Phishing Attack · Dos / DDos · Vishing Attack · Viruses · Malware Attack · SQL Injection Attack

'Crime in India' Report 2022 (NCRB) highlighted 24.4% surge in cybercrimes in India since 2021.

Common Cybersecurity Myths
- Strong passwords alone are adequate protection
- Major cybersecurity risks are well-known
- All cyberattack vectors are contained
- Cybercriminals don't attack small businesses

Cyber Warfare
- Digital attacks to disrupt vital computer systems, to inflict damage, death, and destruction.

CYBER THREAT ACTORS

CYBER THREAT ACTOR	MOTIVATION
NATION-STATES	GEOPOLITICAL
CYBERCRIMINALS	PROFIT
HACKTIVISTS	IDEOLOGICAL
TERRORIST GROUPS	IDEOLOGICAL VIOLENCE
THRILL-SEEKERS	SATISFACTION
INSIDER THREATS	DISCONTENT

Types of Cybersecurity
- Critical infrastructure security (Robust access controls)
- Network security (Deploying firewalls)
- Application security (Code reviews)
- Cloud Security (Tokenization)
- Information security (Data masking)

Recent Major Cyber Attacks
- WannaCry Ransomware Attack (2017)
- Cambridge Analytica Data Breach (2018)
- Financial data of 9M+ cardholders, including SBI, leaked (2022)

Regulations & Initiatives
- International:
  - UN Group of Governmental Experts (GGE) on Advancing Responsible State Behaviour in Cyberspace
  - NATO's Cooperative Cyber Defense Centre of Excellence (CCDCOE)
  - Budapest Convention on Cybercrime, 2001 (**India not a signatory**)
- India:
  - IT Act, 2000 (Sections 43, 66, 66B, 66C, 66D)
  - National Cyber Security Policy, 2013
  - National Cyber Security Strategy 2020
  - Cyber Surakshit Bharat Initiative
  - Indian Cyber Crime Coordination Centre (I4C)
  - Computer Emergency Response Team-India (CERT-In)

Steps Needed for Cyber Security
- Network Security
- Malware Protection
- Incident Management
- User Education and Awareness
- Secure Configuration
- Managing User Privileges
- Information Risk Management Regime

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Read More: Pegasus Spyware

Note:

IPEF to Organise Clean Economy Investor Forum

Indo-Pacific Economic Framework for Prosperity (IPEF) has decided to organize a **Clean Economy Investor Forum** in Singapore on 5ᵗʰ - 6ᵗʰ June 2024.

➢ The IPEF Clean Economy Investor Forum is one of the initiatives under the IPEF, which was launched in May 2022.

➢ The Forum aims to mobilize **investments into sustainable infrastructure,** climate technology and renewable energy projects.

➢ It will provide a platform for climate tech entrepreneurs and companies in India to recognise the top climate tech companies and start-ups among the member countries and present them to global investors.

➢ The **IPEF comprises four pillars of cooperation** namely Trade, Supply Chain, Clean Economy and Fair Economy.

➢ It **includes 14 country partners** like Australia, Brunei Darussalam, **Fiji, India, Indonesia, Japan**, the Republic of Korea, Malaysia, New Zealand, Philippines, Singapore, Thailand, the United States and Vietnam.

Read more: Indo-Pacific Economic Framework

61st National Maritime Day

Recently, the 61st National Maritime Day was celebrated by the Ministry of Ports, Shipping and Waterways. The event also included the celebration of Sports Day on 5ᵗʰ April 2024 in New Delhi.

➢ The day was observed as a tribute to the maiden voyage of the **first Indian-owned ship, SS Loyalty from Mumbai to London on 5ᵗʰ April 1919.**

➢ On this day, various ports and maritime organisations under MoPSW, commemorated the velour and dedication of seafarers, exemplifying Maritime Excellence.
  ○ Seafarers are people who work on ships or people who travel regularly on the sea.

➢ Also, the prestigious **Sagar Samman Awards** were to acknowledge exemplary contributions within the maritime sector.

➢ India is a signatory to both the **STCW Convention and the Maritime Labour Convention (MLC).**
  ○ **STCW Convention1978:** It was the first to establish basic requirements on training, certification and watchkeeping for seafarers on an international level.
  ○ **The Maritime Labour Convention 2006:** It provides standards and regulations relating to the working and living conditions of seafarers.

Read more: Maritime Vision 2030, Call for Safer and Healthier Working Environments: ILO

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Note: