MONTHLY

EPIC!

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PRELIMS + MAINS

PREPARATION

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Focus Article

Demand of Special Category Status by States

News: With the return of coalition Government at the Centre, two regional coalition partners have raised the pitch of the demand for Special Category Status for their States (Bihar and Andhra Pradesh).

What is the Special Category Status?

- The Special Category Status (SCS) is the classification assigned by the Union Government to **assist the development** of certain States that face distinct **geographical and socio-economic disadvantages**.
- SCS was introduced in 1969 based on the recommendations of the **Fifth Finance Commission** (FC). The SCS was based on certain criteria popularly called **Gadgil Formula**.
- The mechanism was developed to assist certain States in their development and **fast-tracking growth**.
- **Factors considered for granting the SCS (According to Gadgil Formula)**
  - Difficult and hilly terrain.
  - Low population density and/or a sizable tribal population.
  - Strategic location along borders.
  - Economic and infrastructural backwardness.
  - Non-viable nature of State finances.
- The **Fourteenth Finance Commission** had done away with the 'Special Category Status' for States, except for the Northeastern and 3 hill states. According to the Fourteenth Finance Commission, the resource gap of the States should be filled by **increasing the devolution of tax** to 42% from 32% under the Thirteenth Finance Commission.
- The States with Special Category Status include:
  - Assam, Nagaland, Himachal Pradesh, Manipur, Meghalaya, Sikkim, Tripura, Arunachal Pradesh, Mizoram, Uttarakhand and Telangana.
  - **Jammu and Kashmir had Special Category Status till 2019**. With the abrogation of Article 370 and the **conversion of the State into a UT**, the Central funds are being transferred to the two UTs (J&K and Ladakh) directly by the Union Government (**do not fall under 'Devolution to the States'**).
    - The Fifteenth FC had reduced the share of devolution from 42% to 41% to adjust for the transfers to J&K and Ladakh under transfers to UTs.

What are the reasons behind Andhra Pradesh's and Bihar's Demand for Special Category Status?

Andhra Pradesh

- **Bifurcation**: Andhra Pradesh had to suffer a loss of revenue and the loss of developed capital region around Hyderabad due to AP Reorganisation Act, 2014. Hyderabad is now capital of Telangana.

- **Increased Debt**: Andhra Pradesh has witnessed mounting debt, which increased from INR 97,000 crore in 2014 (year of bifurcation) to INR Rs 258,928 crore by 2018-19.
- **Post-devolution Revenue Deficit**: The Fourteenth Finance Commission had estimated that post-devolution revenue deficit for AP for the 5-year period (2015-20) would be INR 22,113 crore. However, the actual post-devolution revenue deficit has been INR 66,362 crore.
- **Unequal Distribution**: The successor State of Andhra Pradesh has inherited ~59% of the population, debt, and liabilities of the original State, but only 47% of its revenues.

Bihar

- **Economic Backwardness**: About 33% of Bihar's population lives in poverty. The State has a low per-capita GDP of ~INR 45,000 (2019-20, ~33% of national average), making it as one of India's poorest states.
- **Impact of Bifurcation**: The bifurcation led to industrial decline, with many industries moving to Jharkhand, resulting in fewer employment opportunities.
- **Natural Challenges**: The State faces regular **floods in the north** and **droughts in the south**, impacting agriculture and livelihoods.
- **Need for Welfare Funding**: The State Government cites high load of welfare spending.
  - The Government says it needs INR 2.5 lakh crore over 5 years to spend on welfare measures.
- **Lack of Resources**: The State Government argues that the **lack of natural resources** contributes to its under-development.

What are the benefits associated with the Special Category Status?

Special Category Status provides significant **financial and tax benefits** to the recipient States from the Union Government. This aims to **aid their development**, to overcome their **geographical and socio-economic disadvantages**.

- **Higher Devolution**: In the past, SCS States used to receive ~30% of Central Assistance. However, after the recommendations of the Fourteenth and Fifteenth Finance Commissions, the assistance to SCS States has been replaced by increased **devolution of the divisible pool funds for all States** (increased to 42% and 41% in the Fourteenth and Fifteenth FCs respectively from ~32% earlier).
- **Higher Grant-in-aid**: Higher grant-in-aid is provided to the Governments of the Special Category States from the Union Government e.g., the per capita grants to Special Category States is INR 5,573 per year, whereas Andhra Pradesh (AP) which is pushing for SCS receives only INR 3,428.
- **Enhanced Central Funding**: In the Special Category States, the Union Government provides 90% of the funds for Centrally Sponsored Schemes, compared to 70% in the non-SCS States. The remaining funds (10% SCS, 30% non-SCS) are provided by the State Governments.
  - The unspent money in a financial year does not lapse and is carried forward.
- **Tax Exemptions and Incentives**: The SCS States enjoy **special industrial incentives** such as Income-tax exemptions, waivers on custom duty, reduced excise duty, corporate tax exemption for a certain period, concessions and exemptions relating to GST etc.
- **Improvement of Employment Opportunities**: Special incentives to the Special Category States provide resources which are vital for rapid industrialization. It also leads to improved employment opportunities for the youth and overall development of the State.
- **Investment in Infrastructure**: Granting of SCS encourages investments in infrastructure and industries which has positive impact on the economy of the State.

What are the concerns with Special State Status?

The Fourteenth Finance Commission had opposed the continuation of SCS on the multiple grounds.

- **Increased Burden on Central Finances**: Provision of additional funds, tax concessions and other benefits to SCS States puts a significant financial burden on the Union Government's budget. It also leads to concerns about fiscal sustainability.
- **Inequitable Distribution of Resources**: Allocation of Special Category Status to some States while denying it to other States can lead to an inequitable distribution of resources.
- **Increase in Dependency and Reduction of Accountability**: There are concerns that the SCS States may become overly dependent on Central assistance. This also **reduces their incentive to mobilize their own resources** and hinder the development of a self-sustaining economy.
- **Lack of Constitutional Basis**: SCS lacks a clear Constitutional or legal foundation. It is granted by the administrative decision of the Union Government, making it vulnerable to changes.

What are the other issues related to Economic Federalism in India?

- **Fiscal Centralization**: States have raised concerns related to fiscal centralization. The Union Government has resorted to **cesses and surcharges** which do not form part of **divisible pool of taxes**. Hence States'

States' share in central taxes: recommended and effective

Commission	Recommended share in divisible pool (%)	Effective share in gross central taxes (%)	Shortfall in effective share relative to recommended (% points)	Share of cesses and surcharges# in center's gross tax revenues (%)
FC 12	30.5	25.9	-4.6	
FC 13	32.0	27.9	-4.1	9.6
FC 14	42.0	34.9	-7.1	12.8
FC 15 (1)	41.0	28.9	-12.1	23.8
FC 15 (2)	41.0	30.0*	-11.0*	20.5*

Source: Union Budget Documents, Reports of 12th-15th FCs
*pertains to data for one year namely, FY22 (BE); #excludes GST compensation cess

share in taxes is decreasing. The effective share of States in gross central taxes is only 29-30% compared to 41% recommended by the Fifteenth FC. *(Refer EPIC September 2022 (click) for Fiscal Centralization in India and EPIC February 2023 (click) for Fiscal Imbalance Between Union and State Governments)*.
- **Implementation of GST**: States have complained about **loss of fiscal autonomy** with the implementation of GST, making them **dependent on Central transfers**. The GST Compensation has been discontinued in 2022. RBI has pointed out that at least 6 States will be severely impacted with discontinuation as GST compensation accounted for more than 10% of tax revenues of these States.
- **Fifteenth Finance Commission**: There were disputes related to the use of Census 2011 data for determining revenue sharing formula with States. Southern States complain that they have been penalized for effectively controlling their population growth.
- **Expenditure**: States complain that **Centrally Sponsored Schemes** (CSS) **limit their discretion** to spend on welfare measures. They also demand for **higher borrowing limits** to increase fiscal space available to them.

What should be the way forward?

- **Reassess the Criteria for SCS**: There is a need to revisit the criteria for SCS. It can be expanded to consider newer dimensions like **vulnerability to climate change** and **natural disasters**.
- **Alternative Funding Models**: Following the Raghuram Rajan Committee's suggestion, there is a need to explore new funding models based on a multi-dimensional index.
- **Increased Devolution by Finance Commission**: There must be an increase in the devolution by the Finance Commission to address the poverty alleviation, focused aid for disaster management and agriculture, and policies that attract new industries and create job opportunities.
- **Terms of References for Finance Commission**: States should be consulted in **finalizing the Terms of Reference** of the Finance Commission.
- **Rationalize Cess and Surcharge**: The Union Government should review the current cesses and surcharges and rationalize their levy.
- **Review of Transfers**: All transfers to States may be reviewed to **minimize discretionary transfers**, particularly those channelled through CSSs.
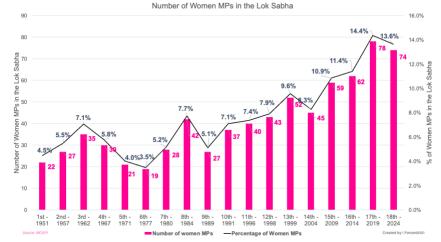
1. Political Empowerment of Women in India

News: Only 74 women (13.6%) were elected to the Lok Sabha in the General Election 2024, out of 797 women contestants. This is much below the 33% seats reserved for women under the 106th Amendment (when implemented).

What has been the status of women representation in India?

Parliament

- The proportion of Women MPs in the Lok Sabha has varied between 3.5% (6th *Lok Sabha*, 1977; 19 *women MPs*) to 14.4% (17th *Lok Sabha*, 2019; 78 *women MPs*). The 1st Lok Sabha had 22 women MPs out of 489 with share of ~4.5%.
- The proportion of women MPs in the Lok Sabha has been greater than 10% since 2009.

Number of Women MPs in the Lok Sabha

State Legislative Assemblies

- Like in the Lok Sabha, the proportion of women MLAs has been low.
- As of December 2022, Chhattisgarh Legislative Assembly had the highest share at 14.4%, followed by West Bengal (13.7%), Jharkhand (12.4%) and Rajasthan (12%).

Global Comparison

- According to the **Inter-Parliamentary Union** (IPU) 'Women in Parliament' Report (2021), the global share of women in Parliaments was 26.1%.
- India ranks lower than 140 other nations in terms of the number of women serving in their national legislatures. India is behind several African and South Asian nations in this regard.

What is the need for political empowerment of women?

- **Accountability and Gender-Sensitive Governance**: Political empowerment of women facilitates direct engagement in public decision-making.
  - It ensures better accountability to women.
  - It helps in undertaking reforms that can help make all elected officials more effective at **promoting gender equality in public policy**.
- **Gender Perspective in Policy-making**: Women have even lesser representation at leadership levels. Greater number of women leaders can better integrate gender perspective in policy making.
- **Focus on Gender issues**: According to UN Women, higher numbers of women in Parliament contributes to stronger attention to women's issues and help in their redressal. With political empowerment of women, gender issues become **electoral issues** and **women-specific schemes become part of electoral manifestos**.
- **Gender Equality**: Women's political participation is a fundamental prerequisite for gender equality and genuine democracy.
- **Alter Gender Norms**: With political empowerment of women, the entrenched stereotypes like women being 'homemakers' get demolished.

- **Improvement of Economic Performance**: According to the UN University, women legislators improve the economic performance of their constituencies 1.8% more than male legislators. Evaluation of the *Pradhan Mantri Gram Sadak Yojana* shows that the **share of incomplete road projects is 22 percentage points lower in women-led constituencies**.

Proportion of Women in State Legislative Assemblies* (%)
*As of December 2022

Source: PIB
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What are the reasons behind low political representation of women in India?

- **Gender Gaps in Political Ambition**: Gender conditioning leads to lack of political ambition in women. They are generally discouraged to run for higher offices/positions.
  - In many families, girls are **conditioned** to stay away from fierce competition since childhood.
  - With the **rising criminalization**, politics is considered a 'dirty' field and women are discouraged from joining politics.
  - Women's willingness to advance in their political careers can also be influenced by **family and relational considerations**. In Sweden, female politicians who are promoted to the post of mayor experience a significant increase in the **likelihood of divorcing their partner**, whereas this is not the case for men.
- **Gender Disparities**: Women face more handicaps than men in accessing education or other resources.
  - Women are responsible for the majority of housework and child care. **Dual burden** of care work and professional work hinders women's progress.
  - Women have **lesser access to assets** (financial or physical like land) than men. Female candidates face greater difficulty in raising money for contesting elections.

What measures have been undertaken for political empowerment of women?

- *Nari Shakti Vandana Adhiniyam* **(Women's Reservation)**: It has been passed to provide 33% reservation to women in the Lok Sabha and the State Legislative Assemblies.
- **73rd and 74th Constitutional Amendment Acts**: The two Acts provided 33% reservation to women in the local bodies. Some states like Bihar have increased the women reservation in the local bodies to 50%.

Political Empowerment of Women International Conventions

Several Global initiatives call for greater political participation of women.

Human Right
- Universal Declaration of Human Rights, 1948 and The **International Covenant on Civil and Political Rights**, 1966 declare **Political Participation as basic human right**.

Eliminate Discrimination
- **Convention on the Elimination of All Forms of Discrimination Against Women** (CEDAW) adopted by the UNGA in 1979 calls for **eliminating discrimination against women**.
- Women must have **equal rights** to vote, hold public office and **participate in policy making**.

Participation
- The 4th World Conference on Women (Beijing, 1995) considered **'Women in power and decision making'** as one of the 12 **critical areas** in its Platform of Action.
- ECOSOC has endorsed a **30% target of women participation** at decision-making levels (1995)

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- **Parliamentary Committee on Empowerment of Women**: In 1997 (11ᵗʰ Lok Sabha), the Committee on the Empowerment of Women was formed to advance the position of women.
- **Gender-Neutral Rules of Lok Sabha**: The rules of the Lok Sabha were made completely gender-neutral in 2014 under the leadership of Speaker Smt. Meira Kumar. Since then, every document has called the head of a Lok Sabha Committee as the Chairperson.

What should be the way forward?

- **Checking Criminalisation**: A check on rising criminalisation and use of money power can encourage more women to participate in the political process.
- **Intra-party Democracy**: Promoting healthy competition within the parties and grooming leadership among the youth cadre can address issues related to nepotism in politics and attract younger women into politics.
- **Women in Rajya Sabha**: Political parties should voluntarily earmark at least 33% seats in the Rajya Sabha for women. It will also ensure gender parity between two houses once the provision of reservation for women in the Lok Sabha kicks in.
- Women should be encouraged to play a **greater role in the functioning of local governments** (Panchayats and Councils). This will equip them with greater political acumen to perform as an MP/MLA.
- The **gender stereotypes must be addressed**. Girls should be encouraged to pursue higher education. Girls should also be given greater opportunity in student politics in colleges/universities to groom them for leadership roles at a younger age.
- **Women's agencies and organizations should be strengthened** for building a progressive society with equality of opportunities among all citizens.

2. Urbanization in India: Trend and Challenges

News: Major cities in India face unique challenges like water scarcity, flooding, rising temperatures, strained infrastructure among others. With rising migration towards cities, urgent steps are required to manage urbanization and make it sustainable.

What is the trend of urbanisation in India?

- Urbanization is the process of **shift in population from rural to urban areas**, leading to expansion of cities.
  - Many economists consider **urbanization as a key driver of economic growth**.
- India has undergone steady urbanization and the pace is expected to get faster. According to Census 2011, the share of urban population in India rose from 27.7% in 2001 to 31.1% in 2011.
- Urbanization is not limited to Tier-1 cities alone, but it is leading to expansion of medium-sized towns.
- In absolute terms, Maharashtra has the highest number of urban population (50.8 million) followed by Uttar Pradesh (44.4 million) and Tamil Nadu (34.9 million).

What are the drivers of urbanization?

Urbanization is principally driven by rural-urban migration due to various economic and social factors:
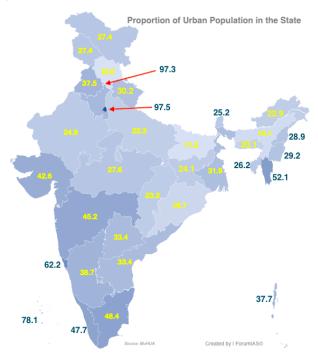
- **Livelihood Opportunities**: Cities offer greater job opportunities compared to villages. Large businesses, offices and factories located in urban areas provide skilled, semi-skilled and low-skilled jobs.
- **Education**: Larger cities have larger and better educational institutions. People move to cities to access better education and enhancing their prospects for better job opportunities.
- **Amenities and Lifestyle**: Cities offer amenities that are often unavailable in rural areas e.g., bigger hospitals providing specialized care.

What are the challenges related to Urbanisation in India?

The process of urbanization in India has been largely unplanned and haphazard.

- **Affordable Housing and Slum Formation**: High land price has made affordable housing inaccessible. Unauthorized colonies have come up encroaching Government land.
  - According to a Government report in 2012, an estimated **18.78 million more houses were required** to cater to the housing demand in the country.
  - According to Ministry of Housing and Urban Affairs, **29.4% of urban population lived in slums in 2009**.
  - Proliferation of slums creates pressure on existing infrastructure and **reduces liveability** of cities.
  - It also leads to **lack of access to basic amenities** like clean drinking water, electricity, healthcare and educational facilities.
  - The authorities periodically undertake **demolition activities** in unauthorized construction areas, which further adds to the problem.

Proportion of Urban Population in the State

Source: MoHUA   Created by | ForumIAS©

- **Environmental Pollution**: Cities in India are facing **severe air pollution** due to rising vehicular traffic, industrial activities and particulate matter from construction. **World Air Quality Report 2023** listed 9 Indian cities among top 10 most polluted cities in the world.
  - **Discharge of untreated effluents in rivers** has led to pollution in rivers like Ganga and Yamuna along the major urban centers like Kanpur and Delhi.
  - Inadequate facilities related to **solid waste treatment** has led to creating of huge landfills which are an environmental hazard.
- **Urban Flooding**: Unplanned construction, especially in encroached lands over riverbeds and lakebeds, has resulted in frequent incidents of urban flooding in Mumbai, Chennai, Bengaluru, Delhi among others.
- **Water Scarcity**: Large growth in population in cities have put pressure on existing water resources leading to acute water scarcity. Bengaluru and Delhi have faced severe shortage in Summer 2024.
- **Heat Island Effect**: Lack of green cover (parks, urban forests etc.) and **concretization of urban spaces** has led to heat island effect, making the heatwaves worst in urban areas.

What steps are needed to address the challenges related to urbanization?

- **Urban Planning**: The capabilities of local bodies with respect to planning should be strengthened. Long-term **city development plans** should take into account anticipated population growth and plan infrastructure development along the **growth corridors**. *(Refer EPIC October 2022 for Urban Planning in India)*.
- **Slum Redevelopment**: Existing slums should be redeveloped in a sustainable manner. *(Refer EPIC October 2023 for Slum Redevelopment in India)*.
- **Green Infrastructure**: New infrastructure shall take long-term sustainability into account. Green spaces, parks, rainwater harvesting and other measures should be mainstreamed. The concept of '**Sponge City**' should be adopted wherever possible. *(Refer EPIC July 2023 for Urbanization and Waste Water Management)*.
- **Waste Treatment**: Infrastructure related to treatment of solid waste and industrial effluents should be enhanced to reduce environmental pollution. Public-private partnership should be used to expand collection of waste for improved processing and recycling.

General Studies Paper II

1. Systems of Representation: First-Past-The-Post and Proportional Representation

News: Several political commentators have called for replacement of the current First-Past-The-Post (FPTP) system with a Proportional Representation System in the Parliament and State Assemblies.

What are the advantages of the FPTP System?

- **Simple**: The FPTP system is easy for the people to understand.
  - People have to vote for just one person/party.
  - India's Election Commission introduced **use of symbols** in 1952 to make it convenient for the illiterate voters to exercise their right.
  - FPTP system is also **administratively convenient**.
  - Hence, it is an **economical and efficient method**.

Features of the FPTP System
- **Single Vote**: Voters cast a **single vote for a single candidate**.
- **Single Winner**: The candidate **who receives the most votes** in a constituency is declared the winner.
- **Plurality of Votes**: The winner does not need to get a **majority** (more than 50%) of the votes, but only a **plurality** (the largest number) of the votes.
- **Disproportionate Outcomes**: This system frequently leads to disproportionate outcomes in terms of vote share and Constituencies won. In the 2024 General Elections, the NDA won ~43% vote share and ~54% of the Lok Sabha seats.
- The FPTP System is also called **Simple Majority System** or **Plurality System**.
- The FPTP System is used for electing representatives to the Legislatures in **India** (Lok Sabha), the **UK**, the **US**, **Canada** etc.

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- **Stable Governments**: FPTP system allows the electorate to provide decisive mandates and helps form stable Governments. A single party often gets the majority and dependence on coalitions is relatively lesser.
- **Avoids Extremism**: Political parties professing extremism remain on the fringe as with minuscule vote share (5-10%) they are unable to get any representation in the legislature. In Proportional Representation (PR) System, a vote share of even 0.19% will allow a party to get 1 seat in the Lok Sabha.
- **Accountability**: In PR System, the electorate votes for the party. In the FPTP System, voters vote for the candidates fielded by the political parties. This ensures greater accountability towards the electorate as the **work and credentials of the candidates matter in the voting preference of the people**. Some experts call this **geographic accountability**.

What are the advantages of Proportional Representational (PR) System?

- **Ensures Every Vote Counts**: PR System ensures that every vote counts e.g., theoretically, a vote share of 0.19% is enough to ensure representation in the Lok Sabha (1/543 = 0.1841%)
- **Representation**: It can ensure representation to small and minority groups. It can provide them with voice in the Legislature.
- **Checks Gerrymandering**: Gerrymandering refers to the

Features of the Proportional Representation (PR) System
- **Proportional**: Political parties get seats in the Legislature in **proportion of their vote share** i.e., 25% vote share means 25% seats in the Legislature.
- **Fair Representation**: It **ensures fair representation** for small parties as they can get representation with very little vote share.
- **Multiple Types**: It has several forms.
  - **Single Transferable Vote**: It allows the voters to **rank candidates in order of preference**. Candidates need First Preference votes above a **pre-defined quota** to get elected. The surplus votes above the quota are transferred to other candidate. It is used in **election of the President in India**.
  - **Mixed-Member Proportional Representation (MMP)**: It is mix of FPTP and PR System. One candidate is elected through the FPTP system from each territorial constituency. **Additional seats are allocated** to various parties based on their **percentage of votes nationwide**. The System is used in Germany, South Korea and New Zealand.

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exercise of manipulating boundaries of electoral constituencies to ensure favorable electoral outcomes to a

particular party or group. Due to proportional representation according to the vote share, Gerrymandering has a little benefit in PR System.

What are the disadvantages of the two systems?
FPTP
- **Unfair Representation**: It does not allow fair representation. The minority groups are often under-represented.
- **Disproportionate Outcomes**: Parties can win disproportionately more number of seats in the Legislature compared to their vote share.
- **Weak Opposition**: Disproportionate outcomes may lead to weak and fragmented opposition to keep a check on the Government. It can lead to autocratic tendencies in the Government.
- **Mobilization**: Political Experts argue that the 'winner-takes-all' outcome under FPTP and narrow margin of victory in 'closely contested constituencies' causes political parties to mobilize people on the lines of caste or religious identity.
- **'Wastage' of Votes**: Critics of the FPTP system argue that votes of the losing candidates 'go waste' as they do not result in any representation. (However, this can be termed as a 'narrow' view).

Proportional Representation
- **Unstable Governments**: PR system leads to unstable Governments as no political party often gets clear majority due to fragmentation of votes among smaller parties and groups.
- **Complexity**: PR systems are very complex as voters have to exercise multiple choice. It requires higher levels of literacy. It is also **more complex for the administration** to conduct and declare results.
- **Party over Candidates**: In the PR System, the agenda and issues of the Party gets more importance than the candidates. As such local issues may get neglected.

According to **Electoral Reform Society** (UK), less than 50 countries use the FPTP system globally. Almost 100 countries use various forms of PR System. 7 countries including New Zealand and Germany have Mixed Member Proportional System.

What should be the approach?
- The **Law Commission** in its **170th Report** (1999) had recommended **adoption of German system in India**.
  - Germany's Bundestag (Lower House) has 598 seats. 299 seats (50%) are filled from constituencies under the FPTP system and the other 50% seats are allocated according to the PR system.
  - The Law Commission Report noted that the existing 543 seats in the Lok Sabha can continue to be filled with the FPTP System.
  - Lok Sabha seats can be increased by an additional 25% (136 seats) which can be filled with PR System.
  - Similar expansions can be undertaken in the State Legislative Assemblies as well.
  The proposal can be deliberated by all stakeholders to take the discussion forward.
- The freeze on delimitation will end soon. It is expected that the number of Constituencies will have to rise. There are concerns among the States in Southern India that they might lose out on representation in the Lok Sabha due lower rise in their population. To address the concerns regarding equitable representation, the **adoption of MMP system can be deliberated**.
- At the same time, it should be kept in mind that the **FPTP system has served India's electoral democracy well since Independence**. The **level of literacy** and **political education of the electorate** should be kept in mind while considering the two systems. Any shift to an alternate system should be through consensus of all stakeholders after a thorough debate.

2. Evolution of Right to Property: Supreme Court's Judgments and Constitutional Amendments

News: The Right to Property has remained a contentious issue in India.

What are the SC Judgments related to the Right to Property?

Entry 42, Concurrent List, Seventh Schedule
Acquisition and requisitioning of property.
It has been emphasized that the term used here is 'acquisition' and not confiscation, which entitles a fair compensation.

- *The State Of West Bengal vs Mrs. Bela Banerjee (1953)*: The Supreme Court focused on how to interpret Article 19(1)(f) and Article 31(2) of the Constitution. The SC decided that the word 'Compensation' in Article 31(2) meant providing the owner with a **fair equivalent** of the property lost by them.
- To change this interpretation, the **4th Constitutional Amendment** was passed in 1955. This Amendment explicitly stated that **Courts could not question the inadequacy of compensation**.
- The Parliament realized that the term 'Compensation' in Article 31(2) was causing problems. So, the term was replaced with 'amount' through the **25th Constitution Amendment Act**, **1971**, which prevented the Courts from interpreting it.
- *Kesavananda Bharati v. State of Kerala (1973)*: The SC interpreted that while the adequacy of the amount paid was non-justiciable, the principles for determining such compensation were still open to judicial review.
- The Parliament passed the **44th Constitutional Amendment** (1978) which deleted the Right to Property from the list of Fundamental Rights and placed it as a **Constitutional Right under Article 300-A**.
  - **Article 31**, which had caused a lot of debate about how compensation should be decided, **was repealed**.
- In the years following the deletion of Article 19(1)(f) and Article 31, the Supreme Court has held that the Right to Property is not only a Constitutional right but also a **human right**.
- *MC Mehta vs Union of India*: The SC held that a law depriving a person of property must be **just**, **fair** and **reasonable**.
- *BK Ravichandra vs Union of India (2020)*: The SC observed that the phrasing of Article 300A closely resembles Articles 21 and 265, and hence its guarantee could not be read down.
- *Kolkata Municipal Corporation vs Bimal Shah (2024)*: The Supreme Court has highlighted 7 facets protected under Article 300-A, including the right to notice, the right to be heard etc. *(Refer EPIC May 2024 (click) for State Can't Acquire Private Property Without Proper Procedure: Supreme Court)*.
  - The requirement of providing compensation (which means the value of the property taken in monetary terms, as established in the Bela Banerjee case) has been restored.

3. Issues with India's Criminal Justice System

News: The handling of hit-and-run case in Pune (bail granted in lieu of writing essay) has highlighted the shortcomings in the Indian Criminal Justice System.

What are the issues with India's Criminal Justice System?

- **Delays**: The trial process is marred by **delays** and **frequent adjournments** of hearings in court due to lack of adherence to procedures.
- **Pendency**: According to the National Judicial Data Grid, ~4.5 crore cases are pending in courts at various levels in India.
- **Low Conviction Rate**: In cities, the conviction rate for negligent driving and hit-and-run cases is only 30%. Over 90% of such cases are pending in courts.
- **Resource Constraint**
  - **Judges**: There are only 21 judges per million population (Government of India in Rajya Sabha, 2023) against 50 judges per million recommended by the Supreme Court.

▪ There are 30% vacancies in the High Courts and 22% vacancies in lower courts (India Justice Report, 2022).

○ **Police**: The Police-to-Population ratio is 152.8 police personnel per lakh persons (the Government of India in Lok Sabha, 2023) against 222 recommended by the UN.

Criminal Justice System

> It is an apparatus employed by the Government to enforce standards of conduct required by the Rule of Law from the people subjected to authority.

> The system is made up of set of laws, procedures, personnel and institutions that aim to investigate, prosecute, penalize and prevent criminal conduct.

> In India, the Prosecution (Laws/Procedures) have been governed primarily by the Indian Penal Code, 1860; Criminal Procedure Code, 1973 and Indian Evidence Act, 1872.

> There are numerous other laws related to specific offences (like terrorism, crimes against children etc.) but these 3 laws form the principle basis of criminal justice in India.

Police — Investigation of Crime

Prosecution — Laws and Procedures

Courts — Adjudication of cases

Prisons — Correction and Reform

Some other classifications propose 3 components: Law Enforcement (Laws and Police), Courts, and Prisons.

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○ **Prisons**: The prisons in India are operating at 130% of the capacity (2021, 5.54 lakh inmates against capacity of 4.23 lakhs). The ratio of undertrials has reached 77% in 2021.

▪ **Bail is still treated as an exception rather than rule**. The rich get the bail while the poor languish in jail (Law Commission, 268th Report).

○ **Laboratories**: There is lack of forensic laboratories (7 Central and 31 State Forensic Laboratories in India) and experts for scientific investigation of evidence.

• **Quality of Investigation**: Scarcity of trained personnel impacts quality of investigation. Political interference and corruption impact impartiality of investigation.

○ Police personnel are poorly trained and lack resources required for scientific handling of crime scenes leading to **loss of forensic evidence** (ballistics, blood or DNA samples).

○ Police personnel have to **handle both law enforcement** and **criminal investigation** overburdening them.

○ Police are accused of **custodial violence** to **coerce testimony** from suspects.

What reforms are necessary in India's Criminal Justice System?

• **Bail Reforms**: All Courts should follow the Supreme Court's observation that **Bail should be the rule and jail an exception**. The **Law Commission (268th Report)** has recommended that those detained for an offence with punishment up to 7 years imprisonment, be released on completing 1/3rd of that period. For longer duration, the detainees should be released after completion of half of the period.

○ **Section 436A of the CrPC** stipulates release of the detainee if they have spent half of the period of maximum sentence (during the trial) for the offence they are accused, on personal bond (e.g., release after 7 years in prison if the maximum punishment for the offence is 14 years imprisonment). This should be followed more stringently by courts. *(Refer EPIC July 2022 (click) for The Supreme Court's Observations Regarding Provisions of Bail)*.

• **Prison Reforms**: The physical infrastructure in prisons must be improved in addition to implementation of recommendations of various committees like **Justice Mulla Committee**, **Justice Iyer Committee on Women Prisoners** etc. *(Refer EPIC February 2023 (click) for Issues Related to Prisons and Prison Reforms)*.

○ The Government should also consider formulation of a **National Policy on Prisons**. **Bureau of Police Research and Development** (BPRD) has formulated the **National Policy on Prison Reforms and Correctional Administration**.

• **Judicial Reforms**: The Judicial vacancies should be filled more promptly. There should be more transparency in appointments. There should be broader discussion on **All India Judicial Services**. *(Refer EPIC December 2023)*.

○ **Procedural reforms** in judiciary, led by Supreme Court, should be undertaken e.g., frequent adjournments in hearings shouldn't be allowed *(Refer EPIC March 2022 (click) Reducing Pendency of Cases by Procedural Reforms)*.

o The physical infrastructure of courts also need to be improved.

o The **use of technology like AI** to prepare case briefs can help reduce workload of Judges and expedite the trial process. *(Refer EPIC June 2023 (click) for Reforms Needed in Legal System in India).*

- **Legal Aid**: Effective legal representation is a constitutionally guaranteed right. **Prison authorities** should coordinate with **legal services authorities** to **facilitate communication between the lawyers and the accused**. *(Refer EPIC August 2023 (click) for Bills to Reform India's Criminal Justice System).*

4. The Need to Regulate Opinion and Exit Polls

News: The Opinion and Exit Polls related to General Election 2024 have been widely off-mark. This has called for greater regulation and transparency in the conduct of such polls.

What has been the stand of Election Commission of India regarding Opinion and Exit Polls?

- The Election Commission of India (ECI) has **opposed both the Opinion and Exit Polls**. The ECI has observed that opinion polls can interfere with free and fair elections as some opinion polls may be **sponsored**, **motivated** and **biased**.

- The **polls are opaque** about the survey methodology or quality of survey sample.

  o Such polls amount to '**disinformation**' and can result in '**undue influence**'.

- At the two all-party meetings held in 1997 and 2004, all political parties unanimously demanded ban on opinion polls.

- The **ECI had released guidelines in 1998** in this regard which were challenged in the Supreme Court. The SC held that the ECI can't enforce these guidelines **in the absence of law**. The **guidelines were withdrawn**.

- In 2009, the Parliament amended the **Representation of People Act, 1951 (Section 126A)** to restrict the Exit Polls, but no provision was made with respect to Opinion Polls.

> **Opinion and Exit Polls**
>
> An opinion poll is a **pre-election survey** to gather voters' views on a range of election-related issues including their voting preference.
>
> An exit poll, is **conducted immediately after people have voted**, and ask the voters about the party/candidate they have voted.

> **Section 126A of The Representation of the People Act, 1951**
>
> (1) No person shall **conduct any exit poll** and **publish or publicise** by means of the **print or electronic media** or disseminate in any other manner, whatsoever, the **result of any exit poll** during such period, as may be notified by the Election Commission in this regard.
>
> (2)(a) In case of General Election, the period may commence from the **beginning of the hours fixed for poll on the first day** of poll and **continue till half an hour after closing of the poll in all the States and UTs**.

What has been Law Commissions Stand on Opinion Polls?

- The **Law Commission (255th Report)** has observed that an outright ban on Opinion Polls may be **constitutionally impermissible**, while noting down the need to **regulate such polls**.

- Outright ban on conduct or publication of such polls would be inconsistent with existing constitutional standards and would not fall within any of the grounds listed under Article 19(2), or qualify as a **reasonable restriction**.

- Conducting opinion polls is an exercise of rights to free speech under Article 19(1)(a). The Supreme Court has acknowledged that a **general right to know is an element of the right to freedom of speech**.

- The Supreme Court in *Union of India v. Association for Democratic Reforms (1992)* has ruled that voters have a right to information concerning matters that would be relevant to their choices at the ballot. Regulation would have to be targeted at ensuring that a real and effective voters' right to information is secured.

- Regulation of opinion polls also concerns the **freedom of the press**, which serves the larger purpose of the **right of the people to be informed of facts**, views and opinions. Opinion polls **assist the media in indicating contemporary concerns** and attitudes among the public while also giving feedback to the media on the state of public opinion.
- In a staggered, multi-phased election, it would not be possible to blank out the electioneering news in a State going to poll when another State is not. Print, Electronic and Social Media have a national reach and are not contained within the boundaries of a particular constituency where the restrictions apply. Hence, an outright ban is **not practicable**.

What should be the approach?

- Outright ban is not recommendable. However some reforms must be undertaken.
- The agencies responsible for conducting opinion and exit polls should **review their methodology**. They should **reevaluate the sampling methods** to ensure accurate representation of diverse voter population (gender, caste, religion, age, economic status, occupation, region, language etc.)
- There should be **stricter disclosure norms** regarding the **sample size**, **sample quality** and **parameters**, and **questions asked in the survey** etc.
- The details related to **funding of poll agencies** should also be disclosed in order to **prevent potential conflicts of interest**. This can ensure that the polls are not influenced or biased.
- An **independent regulator**, like the British Polling Council would be a viable option. In the past, 6 leading agencies had spoken about the possibility of starting a **self-regulatory body**. However, this has not materialized yet. Efforts should be made to establish the body at the earliest.
- The **Press Council of India** (PCI) and the **News Broadcasting Standards Authority** (NBSA) have laid down some **self-regulatory standards**. However, they are limited in scope and **there is need to widen their scope**.

5. Patna High Court's Decision on Reservation

News: The Patna High Court annulled the Government of Bihar's notification that increased reservation from 50% to 65% for backward classes, scheduled castes, and tribes in Government jobs and educational institutions. This extension of benefits of reservation was based on the Caste Survey of 2023.

What the basis of Patna High Court's Decision?

- The judgment dismissed the idea of '**proportionate representation**' for Backward Classes, stating that this concept is not supported by Article 15 and Article 16.
- Article 16 mentions 'inadequacy of representation'. The HC relied on the Supreme Court's ruling in *Indra Sawhney (1992)*, that observed '**adequate representation**' **should not be interpreted as** '**proportionate representation**'. *(Refer EPIC May 2024 (click) for The Issue of Proportional Benefits)*.
- The Government of Bihar's notification **breaches the 50% reservation limit**. The SC had introduced this limit in *M R Balaji (1962)*, considering it discriminatory under the **right to equality**. This principle has been upheld in subsequent rulings like *Devadasan (1964)*, *N M Thomas (1976)*, and *Indra Sawhney (1992)*.
- The 50% reservation rule is defended on grounds of efficiency and merit. The Patna High Court also noted that "*merit cannot be entirely sacrificed*".
- The court observed that there was **no analysis of the Caste Survey** or **consultation with the experts** before increasing reservation.

What concerns have been raised regarding the Judgment?

- The proposed reservation was not proportionate given that Scheduled Castes, Scheduled Tribes, and backward castes constitute 84.46% of Bihar's population. *(Refer EPIC October 2023 for Caste Survey in Bihar)*.

- o The Supreme Court acknowledged in *Indra Sawhney (1992)* that the proportion of backward classes to the total population is a relevant criterion for reservation.
- The SC in *Indra Sawhney (1992)* Judgment had noted that the 50% limit need to be religiously adhered to in remote regions or **areas that remain out of national mainstream**.
  - o The High Court rejected the idea that Bihar is outside the national mainstream. The Government of Bihar in its defense failed to highlight Bihar's significant handicaps relative to national averages before the Court like **its lowest per capita income** (~33% of national average, 2019-20), **highest fertility rate**, and **lowest college density** in India. These factors present strong arguments for breaching 50% limit in Bihar.
- Before extending reservation to the EWS category, no survey was conducted to assess their under-representation. However, the Supreme Court's Judgment in *Janhit Abhiyan (2022)* represents a departure from the typical strict scrutiny approach in judicial rulings where it allowed breach of 50% limit.
- There is no **scientific or empirical evidence** that supports the notion that SC/ST/OBC employees perform less efficiently than those recruited under the general category. Justice Chinnappa Reddy countered the efficiency argument in *Vasanth Kumar (1985)* challenging the assumption that individuals appointed based on merit naturally outperform those appointed through reservations.

What should be done?

- The issue of reservation has been **deeply politicized** and **exploited for political mobilization**. As highlighted by the Supreme Court, the reservation should be **evidence-based**.
  - o In the past the SC or the HCs have rejected provisions of reservations for certain groups/communities for the **lack of evidence based on empirical data on the representation**.
- The Governments should adopt this policy of evidence-based reservation and all future decisions should be driven by strong evidence of under-representation. *(Read more on the Issue of Reservation).*

6. Improving Learning Outcomes in Schools

News: The National Achievement Survey has shown disparities in educational outcomes across States. There is a need for targeted interventions to improve learning outcomes for all students.

What are the reasons behind the decline in performance?

- **Shift in Assessment Style**: The shift from rote learning to competency-based assessment has added new challenges for students who are not used to this approach.
- **Impact of COVID-19 pandemic**: Disruptions in regular schooling due to pandemic contributed significantly to learning losses.
- **Foundational Learning**: The foundational skills of students in early grades are not strong enough, leading to **compounded difficulties** in higher grades.

Key Findings of the National Achievement Survey 2021

- **Decline in Performance**: Student performance has declined significantly across grades in comparison to NAS 2017.
  - Class 3 scores dropped by 3.9% in Language, 4.7% in Mathematics, and 4.4% in Environmental Studies.
  - Class 10 scores fell by 13.4% in Mathematics, 18.6% in Science, and 9.1% in Social Science.
- **Disparities Across States**: States like Punjab, Rajasthan, and Haryana have excelled, while Meghalaya, Mizoram, Nagaland, and Chhattisgarh lag behind.
- **Drop in Performance with Progression**: Scores decline as students advance from Class 3 to Class 10.
  - Language scores fell from 64.6% in Class 3 to 52% in Class 10.
  - Mathematics scores dropped from 61.2% in Class 3 to 44% in Class 10.

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- **Insufficient Reinforcement of Concepts**: According to **Jerome Bruner's Spiral Curriculum Theory**, a lack of regular revisitation and reinforcement of core concepts leads to gaps in knowledge as students' progress.

How can the National Curriculum Framework (NCF) for School Education 2023 address quality disparities?

- It aims to **define learning standards** clearly and systematically align educational goals with **measurable outcomes**, supporting the core vision of the **NEP 2020**.
- By detailing specific learning outcomes, the NCF allows for **precise assessment** and **targeted interventions**, which help educators identify and **close learning gaps** effectively.
- The framework includes **operational guidelines** for adapting learning outcomes to different contexts and customizing teaching strategies, ensuring that all students meet set competencies.
- These measures contribute to **reducing disparities in educational quality**, as highlighted by the NAS 2021 data.

What should be done?

- **Strengthen Foundational Learning**: The NEP 2020 aims to ensure all children achieve foundational literacy and numeracy by Grade 3, with an emphasis on a shift from rote learning to holistic, integrated, and experiential learning approaches.
- **Enhance Teacher Training**: The NEP 2020 focuses on continuous professional development and the establishment of **National Professional Standards for Teachers** to elevate teaching quality.
- **Use Data-Driven Approaches**: NAS data can be utilized to identify and address specific areas where students are underperforming, ensuring targeted interventions.
- **Promote Competency-Based Education**: The NEP 2020 promotes shift from memorization to competency-based education, ensuring students master essential skills before moving on to more advanced topics.
- **Engage Community and Parents**: Parents and communities should be actively involved in the educational process, making them partners in improving education.
- **Align State Policies with NEP 2020**: State education policies should support the goals of NEP 2020, particularly around foundational learning and teacher training.
- **Implement Bloom's Mastery Learning**: Mastery of lower-order cognitive skills should be emphasized before advancing to higher-order thinking skills. This approach ensures that students fully understand the material at each stage of their education before moving on to more complex concepts.

7. The Issue of Frequent Exam Paper Leaks

News: Exam papers of Major exams like NEET, UGC-NTA-NET were leaked recently. CSIR-NTA-NET was cancelled as a precautionary measure. Frequent exam leak was an electoral issue in some States in the General Election 2024. There is a need to urgently address the issue as it has profound impact on the youth.

What are the recent cases of exam paper leaks in India?

- There have been 41 instances of exam paper leaks in the last 5 years in 15 States.
- This has affected 1.4 crore job seekers who had applied for over 1 lakh vacancies. If NEET-UG 2024 exam is also considered, it affected 24 lakh aspirants aspiring for 1 lakh seats in medical colleges in India.
- Frequent paper leaks had become an electoral issue as many youngsters felt betrayed and had a feeling of angst and disappointment against the Union and State Governments.
- Some major exam paper leaks include Uttar Pradesh Constable Recruitment and Promotion Exam (2023), Rajasthan Eligibility for Elementary Teachers (REET, 2023), Telangana State Public Service Commission (TSPSC) Assistant Engineer recruitment (2023) etc.

What are the negative impacts of frequent Paper leaks in India?

- **Impact on Poor Students**: The impact is disproportionate on students from poor and rural backgrounds. They don't have financial support to allow for multiple years of preparation.

o Many poor students take loans to pay for coaching centres, applications etc. which go waste with the cancellation of the exam.

- **Emotional, Mental and Physical Fatigue**: With the cancellation of exams, students experience increased sense of fatigue and the fear of a new generation of aspirants joining the queue.
- **Exacerbation of Job Crisis**: The cancellation of recruitment procedures has added to spiralling of crises in the already scarce job market.
- **Disruption of Academic Calendars**: The postponement or cancellation of Exams disrupt the academic schedules and create uncertainty for students as well as the faculty.
- **Loss of Trust and Confidence**: The frequent paper leaks lead to students losing their faith in the fairness and meritocracy of exams, and question the value of their efforts and education.

What are the lacunae with the exam system in India?

- **Loopholes in the Examination Process**: Setting of question paper, printing and distribution are vulnerable to leaks due to inadequate security measures.
- **Inadequate IT Systems**: Online exams are vulnerable due to inadequate testing and deployment of IT systems.
  o Lack of adequate security measures make them susceptible to hacking.

Steps taken to Check Exam Paper Leaks

> **Public Examinations (Prevention of Unfair Means) Act**: The Act aims to prevent unfair means in the public examinations. It aims to bring **greater transparency**, **fairness** and **credibility** in the public examination system.
>   - It will be applicable to exams conducted by the UPSC, SSC, RRB, NTA, IBPS and Departments of the Union Government.
>   - It has stringent provisions of punishment. The offences are cognizable and non-bailable.

> **Formation of the National Testing Agency (NTA)**: The NTA was formed as a professional exam-conducting body to make the examination system more scientific, reliable, and professional.

> **Transition to Online Exams**: Moving exams online was thought to be a solution to paper-based exams, as it reduces the risks associated with printing and distribution. Created by I ForumIAS©

- **Inadequate Penalties and Enforcement**: The existing laws which criminalize cheating have not led to convictions. This demonstrates lack of effective enforcement and penalties.
- **Lack of Special Investigation Agency**: There is a lack of a dedicated agency or cell to investigate all types of examination offenses and bring culprits to justice quickly.
- **Discretion of the State Governments in adopting the Public Examinations Act**: The Public Examinations Act leaves it to the discretion of the State Governments to draft their own Acts by serving as a model bill. However, State Governments have displayed partisan interests in drafting model bills in the past.

What should be done going ahead?

- **Compensation in Case of Exam Cancellation**: There must be adequate compensation for years of labour, exorbitant financial cost, and the emotional toll incurred by lakhs of candidates who pin all their hopes on the public exam.
- **Establishment of Fast-track Courts**: Fast track courts must be established for the trial and convictions for people involved in paper leaks.
- **Strengthening of Examination Processes**: Security measures must be enhanced in question paper setting, printing, and distribution to plug loopholes. Blockchain technology can be leveraged to securely store and manage exam-related data.
- **Enhancement of Penalties and Enforcement**: Stringent penalties must be imposed on persons resorting to unfair means, according to the provisions of the Public Examinations (Prevention of Unfair Means) Act, 2024.

8. Issues Faced by Transgenders

News: Transgenders continue to face significant challenges. There is a need to improve policies and support systems to promote inclusion and respect for the transgender community in India.

What are the challenges faced by transgender people in India?

- **Workplace Discrimination**: Transgender individuals often face discrimination and exclusion at work. Recently, a transwoman working at a global lifestyle brand was ridiculed by co-workers and customers.
- **Education Barriers**: The literacy rate among transgender people is significantly lower than the national average. Many drop out due to bullying and harassment, leading to depression and anxiety.
- **Job Insecurity**: Employers may hire transgender individuals for performative diversity but fail to provide long-term job security. A transgender employee at a pathology lab was dismissed without documented reasons. Transgenders remain on the fringe of the society.
- **Health and Safety Risks**: Some transgender people turn to prostitution due to job discrimination, increasing their vulnerability to sexually transmitted diseases.

What is the impact of discrimination on transgenders?

- **Mental Health**: Transgender individuals are nearly four times more likely to suffer from depression and anxiety compared to cisgender individuals. Bullying and harassment in schools contribute significantly to these mental health issues.
- **Educational Attainment**: The literacy rate among transgender people is much lower than the national average. Hostile school environments force many to drop out, thwarting their academic goals.
- **Employment Stability**: Discrimination leads to job insecurity. Transgender employees are more likely to be dismissed for minor errors or shortcomings (in the job) compared to other employees.
- **Economic Vulnerability**: Lack of job security makes them economically vulnerable. Desperation for a livelihood may force them to take up illegal activities bringing them in conflict with the law.

What can be done to improve their situation?

- **Specialized Education**: Vocational schools can be established specifically for transgender individuals to provide them with tailored training and guidance.
- **Sensitization**: Transgender-related topics can be included in academic curricula to raise awareness and understanding and sensitize about the issues faced by transgenders.
- **Respectful Practices**: Enforcing the use of chosen names and pronouns, providing gender-neutral facilities, and ensuring confidentiality in all institutions can help reduce the discrimination.
- **Legal and Policy Reforms**: Legal protections for transgender individuals should be strengthened and it should be ensured that educational and employment policies are inclusive.
- **Community Involvement**: Inputs should be sought from the transgender community when designing policies and laws to ensure that such measures address community's actual needs and concerns effectively.

9. No-First Use of Nuclear Weapons and Nuclear Deterrence

News: At the UN Conference on Disarmament, China proposed a global treaty on No-First Use of Nuclear Weapons. Amidst geopolitical uncertainty, such treaty can improve global nuclear security.

Why is there scepticism around China's proposal?

- While China has proposed a Global No-First Use Treaty, its actions indicate otherwise.
- China has increased its nuclear arsenal and deployment of delivery mechanisms (of nuclear weapons) significantly in the recent years.

- China has allowed **nuclear proliferation** by sharing technology with North Korea and Pakistan. Both these countries are considered China's proxies and have aggressive nuclear weapons posture against the US and India respectively. Experts say the nuclear threats issued by North Korea and Pakistan are at China's behest.

What is the strategic importance of No-First Use (NFU) Doctrine?

- **Reduces Risk of Nuclear War**: A NFU policy can decrease the likelihood of nuclear escalation among nuclear-armed states by establishing a clear norm against the initial use of nuclear weapons.

India's Nuclear Doctrine

> Building and maintaining a **credible minimum deterrent**.
> A posture of "**No First Use**". Nuclear weapons will **only be used in retaliation against a nuclear attack on Indian territory** or on **Indian forces anywhere**.
> Nuclear retaliatory attacks can only be authorised by the **civilian political leadership through the Nuclear Command Authority**.
> Non-use of nuclear weapons against **non-nuclear weapon states**.
> In the event of a major attack against India, or Indian forces anywhere, by **biological or chemical weapons**, India will retain the option of retaliating with nuclear weapons.
> Continued commitment to the **goal of a nuclear weapon free world**, through global, verifiable and non-discriminatory **nuclear disarmament**.

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- **Environmental Impact**: Even limited nuclear exchange can have severe environmental consequences. A study by Stanford University estimated that a small nuclear exchange could release over 690 million tonnes of CO_2, which is more than the UK's annual emissions.
- **Global Stability**: Implementing a NFU policy contributes to global stability by preventing the catastrophic humanitarian and environmental effects of nuclear warfare.
- **Defensive vs Offensive Approach**: An NFU policy indicates that the purpose of nuclear arsenal is deterrence. It assures the adversaries that they don't face the nuclear threat which can help reduce tensions.
- **False Alarms**: There were several instances of false alarms in the US and the USSR during the Cold War about the firing of nuclear missiles by the adversary. Such incidents brought the world on the brink of a nuclear war. A NFU treaty would reduce vulnerability to a nuclear war because of false alarms.

What are the recent trends regarding Nuclear Weapons and Deterrence?

- **Europe**: Amidst the ongoing war in Ukraine, Russia has repeatedly threatened of nuclear escalation. In February 2024, the UK announced massive expansion of its civil nuclear sector which, experts say, may also lead to expansion in Britain's nuclear arsenal.
  - French President has called for nuclear weapons to be part of credible European defense against Russia.
  - There are talks of making NATO's nuclear and conventional forces stronger.
- **South and East Asia**: China has rapidly expanded the number of its nuclear warheads. India's nuclear warheads have risen to ~170 after being stagnant ~120-130 for a long period of time.
  - **Japan** and **South Korea** are discussing alternatives to the protection provided by the American nuclear umbrella. A possibility of Donald Trump coming back to power in the US has added to uncertainty. In the first Trump Presidency, he had called for Japan and South Korea to pay for US nuclear defense. Their defence experts have called for domestic nuclear capabilities instead of reliance on the US.
- **Middle East**: Concerns about Iran developing nuclear weapons are making Arab countries, especially Saudi Arabia, more interested in increasing their own atomic capabilities. Reports suggest that civil nuclear technology cooperation is included in the security agreement being discussed between Saudi Arabia and US.

What should be India's approach?

- India should welcome the proposal of a NFU Treaty and should actively participate in the negotiations (if and when they start). It will complement India's own **Nuclear Doctrine** and India's support for **nuclear disarmament**.

- At the same time it is crucial for India to **focus on building defense against China's growing nuclear weapons**. India should develop nuclear and missile capabilities with clear intent in order to enhance its credible minimum deterrence against rising Chinese nuclear warheads.

10. India and G7 Nations

News: The Prime Minister of India attended the G7 Summit in Italy. India is not a member of the G7 Group. India was invited to G7 summits in 2019, 2021 and 2022 as well showing India's rising global stature.

What is the significance of G7 nations?

- **Advanced Economies**: G7 group controls 60% of global net wealth and drives 46% of global GDP. It represents 10% of the world's population.
- **Dialogue on Critical Global Issues**: G7 is a forum to have open and frank discussions on critical global issues. This allows them to understand different perspectives and **build consensus**.
- **Collective Action**: G7 aims to develop coordinated political responses to global challenges. This involves collaborative efforts on issues like trade agreements, security threats, or climate change initiatives.

G7 Group

★ Group of the **most developed and advanced economies** in the world.

★ 7 members include **Canada, France, Germany, Italy, Japan**, the **UK** and the **US**.

★ **Summits are held annually** and hosted on a rotation basis by the group's members.

★ G7 originated from the **Oil crisis of 1973**. The resulting financial crisis forced the leaders of 6 major industrial nations (US, UK, France, West Germany, Japan and Italy) to convene a meeting in 1975. **Canada joined in 1976**, leading to formation of G7.

★ G7 was known as the '**G8**' for several years after Russia joined in 1997. Russia was expelled in 2014 following its annexation of the Crimea region of Ukraine. Created by | ForumIAS©

- **Innovations in Governance**: The introduction of initiatives like the Hiroshima AI Process highlights the G7's role in addressing emerging technological challenges.
- **Crisis Response**: G7 has coordinated actions on global economic recoveries, health emergencies like the COVID-19 pandemic, and geopolitical conflicts including the Russian invasion of Ukraine.

What are the major challenges before G7?

- **Not Representative**: During its formative years, G7 accounted for ~67% of global GDP. Now it accounts for only ~33% (PPP) and less than 50% (nominal) of global GDP. The emerging 7 (E7) economies of India, China, Indonesia, Brazil, Mexico, Russia, Turkey are not part of it.
- **Ineffective on Critical Issues**: G7 has failed to effectively address global challenges like climate change, terrorism, or the crisis in West Asia.
- **Climate Responsibility**: G7 accounts for 59% of historical CO_2 emissions and pledged phase out fossil fuels. There has been no visible progress on their pledge and they currently account for twice the CO_2 emissions than Africa. They have not lived up to their pledge on **climate finance** and **technology transfer**.
- **Trade Conflicts**: Trade disputes among G7 members and with other countries disrupt global economic stability. G7 has an active role in weakening of **rules based of trade regime** through WTO and trade wars.
- **Populism and Nationalism**: The rise of populist and nationalist movements within G7 countries challenge multilateral cooperation and the G7's commitment to globalism and liberal democratic values.

What is the significance of India's association with G7 Countries?

- **Economic Significance**: According to the IMF, India is one of the fastest-growing economies in the world. India's economy is larger than 4 G7 member countries: France, Italy, the UK and Canada.

- India's abundant young and skilled workforce, coupled with its market potential, low manufacturing costs and favourable business climate, makes India an attractive investment destination.
- **Strategic Importance in Indo-Pacific**: India has emerged as a major strategic partner for the G7 countries. This has helped in containing China's expanding influence in the Indian Ocean.

Key Outcomes of G7 Summit

★ **Promotion of G7 PGII (Partnership for Global Infrastructure and Investment)**: G7 will mobilise US$ 600 billion by 2027 to deliver infrastructure projects to middle-income and developing countries.

★ **Support to India-Middle East-Europe Economic Corridor (IMEC)**: G7 nations committed to promoting the IMEC. It also forms part of the PGII intiative.

★ **Support to Infrastructure Projects**: G7 extended support for the **Lobito Corridor** in **Central Africa**, **Luzon Corridor** (Philippines) and the **Middle Corridor**.

★ **Enhancing Interoperability of AI Governance**: G7 countries aim to enhance interoperability amongst their AI governance approaches to promote greater certainty, transparency and accountability.

★ **Extraordinary Loans for Ukraine**: The G7 countries agreed to provide financing of US$ 50 billion in additional funding to Ukraine by the end of 2024.

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- **Energy Crisis**: India's ability to secure discounted Russian oil and supply refined fuels to Europe has made it an important player in addressing the European energy crisis.
- **Russia-Ukraine Conflict**: India's long-standing relationships with both Russia and the West makes it a potential mediator in the Russia-Ukraine Conflict.
- **Regulation of AI**: India has been an active participant in the debate on the global regulation of AI. With the focus of G7 countries on the regulation of Artificial Intelligence, India's association with G7 countries can help in the development of a common global framework for AI.

What are the challenges in further deepening of India's engagement with G7?

- **Escalating conflict in Europe**: As the Russia-Ukraine conflict prolongs, India will find it hard to balance its foreign policy between Russia and the West. The PM of India chose to skip the Ukraine peace conference in Switzerland that was held right after the G7 Summit.
- **Dependence on Russia**: India's reliance on Russia for over 60% of its military equipment creates a complex situation. A strained West-Russia relationship could disrupt supply chains and force India to diversify its defence partnerships.
- **Non-membership**: Though India has been regularly invited to the G7 summits since the last few years, India is still not a member of the group. It limits the scope of engagement and India's role.

What should be the way forward?

The synergies between India and G7 nations, driven by shared values and mutual interests, present vast opportunities for collaborative growth.

- **Deepening Economic Ties**: Encouraging investment in sectors like infrastructure, technology, renewable energy and enhancing trade liberalization efforts can bolster economic relations between India and G7.
- **Strategic Collaborations**: Strengthening defense cooperation through joint exercises, intelligence sharing, and technology transfers can address common security challenges.
- **Multilateral Engagement**: India's active participation in G7 forums can contribute to shaping inclusive global governance frameworks. Joint efforts in climate action, focusing on sustainable development and green technologies, can set benchmarks for global environmental policies.
- **Technological Innovation**: Collaborative efforts in digital infrastructure development, cybersecurity, and artificial intelligence can drive the next wave of technological advancements. Joint research initiatives in fields like biotechnology, space exploration, and renewable energy can foster innovation.

General Studies Paper III

1. The Issue of Unemployment in India

News: The PLFS Quarterly Bulletin (January-March 2024) has shown encouraging trend regarding employment. Yet, creating more jobs remains the biggest challenge before the Government.

What are the Key Findings of the PLFS Quarterly Bulletin?

- **Unemployment Rate** (UR) in urban areas has decreased to 6.7% in January–March 2024 from 6.8% in January–March 2023 for persons of age 15 years and above.
  o Female UR decreased from 9.2% to 8.5% in the corresponding periods.
- **Labour Force Participation Rate** (LFPR) in urban areas has shown an increasing trend from 48.5% (January-March 2023) to 50.2% (January–March 2024) for persons of age 15 years and above.
  o Female LFPR in urban areas rose from 22.7% to 25.6% in the corresponding periods.
- **Worker Population Ratio** rose from 45.6% (January-March 2023) to 46.9% (January-March 2024) for persons of age 15 years and above.
  o Female Worker Population Ratio in urban areas rose from 20.6% to 23.4%.

What are the concerns associated with unemployment in India?

- A recent study found that ~80 million jobs were created between 2017-18 to 2022-23. However, ~**44 million jobs were own account workers and unpaid family workers**. Many Economic experts view this as a fallback option for those who do not have any other avenues.
- **Real wages have risen by only 1.2% per annum** between 2017-18 to 2022-23. This shows that the labour productivity is virtually stagnant.
- **Informal employment has risen** in recent times.
  o ~50% of jobs in the formal sector are informal.
  o ~82% of the workforce is engaged in the informal sector.
  o ~90% are informally employed.
- The unemployment rate among educated youths was **6 times greater for those with secondary education** (18.4%) and **9 times higher for graduates** (29.1%) than for persons who could not read or write (3.4%) (2022).

What are the major causes of Unemployment in India?

- **Population**: Huge population, especially large share of the youthful population, put pressure on the economy and resources.
- **Systemic Issues**: A large population is still dependent on agriculture. Agriculture has **low labour productivity**.
  o The **manufacturing sector** in India has **remained stagnant** both in terms of share in the GDP as well as proportion of

Types of Unemployment

★ **Structural Unemployment**: Caused by **fundamental shifts in an economy**, impacted by factors like **technology, competition**, and **Government policy**. Workers lack the **requisite job skills** or **live too far from regions where jobs are available** and cannot move closer.

★ **Cyclical Unemployment**: Caused by cycles of economic **upturn and downturn**. It generally rises during recessions and **declines during economic expansions**.

★ **Frictional Unemployment**: **Short-term unemployment** when workers look for **new job opportunities** or **transition out of old jobs** and into new ones. It is the result of voluntary transitions within an economy.

★ **Disguised Unemployment**: When more workers are employed than required. Workers have **very low productivity**.

★ **Underemployment**: Underuse of a worker because their **job does not use their skills**, offers them too few hours, or leaves the worker idle.

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persons employed. Growth in the Manufacturing sector is driven by large industrial houses through large projects which are **more capital intensive** and **less labour intensive**.

o The services sector jobs has remained limited to highly **skilled professionals**.

- **Policy Challenges**: A lot of policy measures like Make in India or the initiatives for the MSME sector have failed to translate into robust economic growth or employment creation.
- **Informal Economy**: Most new jobs are coming up in the informal sector that offers low wages, little or no social security and has low value or skill addition. Gig economy workers face issues like irregular wages, and uncertain employment status.
- **Skills Mismatch**: The skills possessed by workforce do not completely align with the demands of the job market. There are fears that with the advent of AI and job automation, the **skill gap will widen further**.
- **Global Factors**: Sluggish growth in the global economy, **geopolitical uncertainties** due to wars, **disruption of supply chains** due to COVID-19, **protectionist measures** and trade wars have negatively impacted global trade and growth rate/employment potential of economies.

What should be done to create more jobs?

- **Focus on MSMEs**: Many experts agree that large manufacturing (like chip manufacturing) will not be able to produce jobs at the required scale. Hence the focus of the Government should be on supporting the MSME sector and address the challenges faced by them.
- **Labour-intensive Services**: Economists like Dr Raghuram Rajan have argued that India may not be able to follow the path of China which developed by being a global manufacturing hub. This is due to rising protectionism and already existing excess capacity. So India may have to rely more on **labour intensive services** like tourism for creating more jobs.
- **Formalization**: Government should promote formalization of the informal sector by simplifying process for registration and compliance. Formalization will improves access to credit and labour productivity.
- **Skilling**: The skilling programmes should be updated to address the needs of modern job market e.g., focus can be on skilling for **electronics sector** (mobile phones, laptops etc.) or **green energy sector** (like solar roof-top projects).
- **Plug Gender Gap**: The gender gap in labour force participation must be plugged through suitable policy measures. Private sector must step in facilitative measures like provision of creche facilities or flexible working schedule/work-from-home opportunities etc.
- **Fostering Entrepreneurship**: The Government should foster a conducive environment for startups by providing financial incentives, reducing bureaucratic hurdles, and offering mentorship programs. Startups should be promoted in sectors that need immediate solutions like agriculture supply-chains, green and renewable energy, energy storage, waste management etc.
- **Infrastructure**: The Government should continue to invest in improving infrastructure, and connectivity.

2. RBI's Transfer of Surplus to the Government

News: The Central Board of RBI has approved transfer of INR 2.11 lakh crore surplus or dividend to the Union Government for 2023-24. The amount was INR 87,400 in 2022-23.

What is the source of RBI surplus? What is the mechanism for transfer of surplus by RBI?

- **Surplus**: Surplus refers to net income derived from the total income minus total expenditure. Out of the Surplus of RBI, **risk provisioning** is made for **monetary** and **financial stability risks**, **credit** and **operational risks**.
- **Transfer of Surplus**: The surplus is transferred to the Government under **Section 47 of the RBI Act**, **1934**.
- The surplus calculation is based on the **Economic Capital Framework** (ECF) recommended by the **Bimal Jalan Committee**.

Earnings of RBI	Expenditures of RBI
• Profits derived from foreign currency assets like bonds, treasury bills and Central Bank deposits. • Earnings from local, rupee-based Government securities. • Short-term based lending. • Borrowing management for both Union and State Governments. • Regulation of banks and non- banking financial bodies. • Commission from overseeing Government transactions and specific underwriting endeavours.	• Operating expenses. • Currency printing. • Staff remunerations. • Transaction commissions for Banks. • Dealer compensations. • Interest paid on deposits and borrowings.

What are the reasons for rise in RBI surplus?

- **High Profits from US Treasury Bonds**: According to the US Department of the Treasury, the RBI has invested US$ 240.6 billion in US Treasuries (March 31, 2024). The **high yields on these bonds**, due to monetary policy tightening, has resulted in substantial **interest income** for the RBI from foreign assets.

> **Section 47 of the Reserve Bank of India Act, 1934**
> **After making provision** for bad and doubtful debts, depreciation in assets, contributions to staff and super-annuation fund and for all other matters **for which provision is to be made** by or under this Act or which are usually provided for by bankers, **the balance**, **of the profits shall be paid to the Central Government**.

- **Surge in Forex Holdings of RBI**: In FY2023-24, RBI's foreign exchange (forex) reserves surged by US$ 68 billion and reached US$ 646.4 billion, which is the highest in 5 years.
- **Higher Earnings from Interest**: The shifting of domestic liquidity into deficit mode has contributed to the Central Bank's higher income. When **liquidity enters deficit**, the **RBI lends to banks**, **earning interest**.
- **Increase in Gold Prices**: The increase in the price of gold has also added to the overall expansion of RBI's balance sheet.
- **Intervention in Forex Market**: RBI's intervention in the forex market has contributed to the higher incomes. RBI sold securities worth US$ 153 billion in the forex market in FY2023-24.

What is the significance of the record RBI surplus transfer to the Government?

- **Increased Capital Expenditure (CAPEX)**: The surplus transfer provides funds to the Government to increase its allocations to infrastructure like roads, railways, and defence projects.
- **Reduced Borrowing and Fiscal Consolidation**: The funds provide the Government with a fiscal space of 0.3% of GDP. This would help in reducing the borrowing and **maintaining fiscal discipline**. It would ensure fiscal deficit reduction remains in sync with the committed glide path of 4.5% by FY2025-26.
- **Boost to Bond Markets**: The Government has raised hopes among the bond traders as it would lead to correction in the yield of Government securities.
- **Meeting Revenue Shortfall**: The latest dividend payout from the RBI will be instrumental in compensating for any slippages in tax revenue.
- **Covering the Disinvestment Target**: The Government has set an ambitious divestment target of INR 50,000 crore for FY2024-25. It is about 67% higher than the revised target for FY2023-24. However, the Government has missed the target for the past few years. The surplus provides a safety revenue cover to the Government.

What should be the way forward?

- **Absorption of Excessive Liquidity**: RBI must absorb the excessive liquidity generated by the surplus transfer by undertaking **open market operation** sales and foreign exchange interventions.
- **Increasing Tax-GDP Ratio**: The Government must not remain dependent upon transfers from the Central Bank or dividend from Public-Sector Enterprises (PSEs). Proper fiscal management must be undertaken to increase tax revenues and the Tax-to-GDP ratio.
- **Rationalisation of GST Rates**: The Government must work on rationalising the rates and slabs of GST.
- **Disinvestment in Public Sector**: The Government must aim to fast track the disinvestment plan of the public sector to meet any revenue shortfall in future.
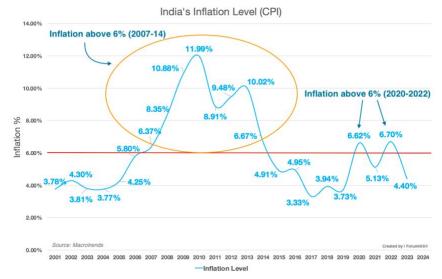
The immediate effect of the RBI transfer will be to simplify the fiscal maths for the Ministry of Finance. However, the longer-term priorities of the RBI will remain the same.

3. Combating High Inflation in India

News: The inflation has eased to 4.7% in May 2024 after consistently remaining above 6%. Projections by the RBI expect the inflation to remain below 5% in FY2024-25. However, the food inflation remains high and may disturb the expectations.

What are the reasons behind high inflation in India?

- **Food Inflation**: Food inflation has remained high in India. It is due to **periodic failure of perishables** caused by un-usual weather (unseasonal rains, droughts etc.), high import prices (edible oil and pulses etc.) e.g., in May 2024, there was a **surge in vegetable prices due to losses caused by heatwaves**. *(Read more)*.

India's Inflation Level (CPI)

- **Increase in Cost of Inputs in Agriculture**: The increase in the cost of inputs like seeds, fertilizers, labour has raised production costs for farmers. This, in turn, has led to higher prices for cereals and pulses. *(Read more)*.
- **Geopolitical Uncertainties**: The global crude oil prices have remained high amidst the Russia-Ukraine and Israel-Hamas wars. Ukraine crisis has contributed to soaring commodity prices (wheat, sunflower oil) .
- **Impact of COVID-19 Pandemic**: COVID-induced lockdowns caused supply chain disruptions across the world, pushing up the commodity prices. Post COVID economic rebound led to a drastic increase in demand for goods causing demand pull inflation.

What are the impacts of Inflation?

- **Moderate inflation** in the range of 4% ± 2%, has **positive impacts on the economy**.
  - It can induce consumers to **save and invest in more productive assets**, boosting the economy in the long run. Prospects of higher revenues (higher prices) and profits makes the manufacturers to produce more.

However, **high inflation rate** (e.g., 6% or more in India) has **serious negative impacts on the economy**.

- **Inflation Tax**: Persistent inflation erodes the purchasing power of money.

o People can buy less with the same amount of money, resulting in decreased standard of living.

- **Exacerbates Socio-economic Inequality**: High inflation rates disproportionately impact the poor, people with fixed incomes and the unemployed people.

- **Reduced Economic Activities**: High inflation leads to tight monetary policy forcing Central Banks to raise interest rates. High interest rate reduces investments by businesses slowing down the economy.

Types of Inflation

★ **Demand Side Inflation (Demand-Pull)**: It is caused by increase in the supply of money which **causes rise in the overall demand for goods and services** faster than the **production capacity of the economy**.

★ **Supply Side Inflation (Cost-Push)**: It is caused by **shortage of factors of production** like labour, land, capital etc. It is also caused by **artificial scarcity created due to hoarding** or **supply shocks** like damage to crops due to bad weather.

★ **Built-in Inflation**: Built-in inflation is related to **adaptive expectations of consumers**. People expect current inflation rates to continue in the future. As such, **workers may demand more wages** to maintain their standard of living. To maintain profit margins, **companies increase prices of products**.

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- **Reduced Competitiveness**: High Inflation makes a country's goods and services more expensive relative to other countries, thereby reducing the international competitiveness of its exports.

- **Currency Depreciation**: In the medium-to-long run, the depreciation of a currency with respect to another currency is directly proportional to inflation differential between the two countries.

What measures have been taken to control inflation?

Inflation management is complex as inflation is caused by several factors such as demand-pull or cost push factors. A **mix of macro-economic policies** are needed to manage the inflation in the economy.

Measure to Control Inflation	Detail
Monetary Policy	• Monetary Policy is employed by the RBI to **control the supply of money in the economy**. • By **increasing the repo rate**, the RBI tries to bring down the rate of inflation in the economy.
Fiscal Policy	• Fiscal Policy is used by the Government to manage inflation through **public expenditure and taxation**. • Government tries to reduce inflation by **raising the tax rates** and **reducing public expenditure**.
Export policy	• The Government can temporarily **ban the exports** and impose **Minimum Export Price (MEP)** to discourage exports of certain commodities to ensure their **availability in domestic markets** e.g., recent bans on exports of wheat, rice, onions.
Price control Policy	• Under the **Essential Commodity Act 1955**, Government can declare a commodity as an essential commodity to ensure supplies to people at fair prices.
Anti-Hoarding and Anti-speculation Policy	• The **Prevention of Black Marketing and Maintenance of Supplies of Essential Commodities Act**, **1980** allows for detention of persons engaged in activities like hoarding, creating artificial scarcities of essential commodities in the market and rigging up of the prices.

What are the challenges with inflation management in India?

- **Focus on Monetary Policy Measures**: Monetary Policy measures are very effective in combating demand side inflation. However, they have limited use in combating food inflation caused by supply-side constraints

(like failed crop due to heatwaves or high commodity prices in the international markets). Food and Fuel have ~50% weightage in CPI index.

- **Inflation Targeting**: The current model of Inflation Targeting is based on the assumption that inflation means **over-heating of the economy** i.e., increased output greater than natural level output. However, in India it is impossible to observe the actual level of output in an economy.
  - o Hence, setting policy rates based on the assumption that the economy is over-heated is considered flawed by several experts. *(Read more about Inflation Targeting here)*.
  - o Moreover, raising interest rates to combat supply-side inflation have dual **negative impact**. It isn't able to bring down inflation. High interest rates lower business investment which slows down the economy.
- **Policy Uncertainty**: Government's reactive policies like ban on exports of agricultural products (wheat, rice, onions) causes uncertainty in the domestic market, leading to rise in stock holdings which ultimately results in price rise.
- **Global Interlinkages**: The raising of interest rates by the US Federal Reserve caused flight of capital away from India, resulting in depreciation of the Rupee. It causes the prices of imported goods to rise. As a result, the action of monetary policies of other countries adds to the challenge of inflation management in India.

> **Types of Inflation Index**
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> **Consumer Price Index (CPI)**: It captures the movement in prices of goods and services that are used by the **households** for consumption. Its major components are: **Food and Beverages** (45.86%), **Housing** (10.07%), **Transport and Communication** (8.59%), **Fuel and Light** (6.84%). It is primarily used for RBI's Inflation targeting and calculating the Dearness Allowance for employees.
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> **Wholesale Price Index (WPI)**: It captures the change in the wholesale prices of goods only. Its major components are: **Manufactured Goods** (64.23%), **Primary Articles** (22.62%), **Fuel and Power** (13.15%). It is primarily used for ascertaining GDP Deflator in the economy.

What should be the solutions for reducing inflation?

- **Agriculture Reforms**: Farm reforms must be undertaken at the earliest to **improve agricultural productivity**.
  - o Measures to enhance the processing of perishables like Onion and tomato must be undertaken.
  - o Agriculture supply chains, including cold storage infrastructure need to be made robust.
- **Rationalize Import Duties**: Import duties on agricultural items should be reduced as cheaper imports can help control domestic prices.
- **Buffer Stock Management**: The Government holds more than 40 million tonnes of rice, much above the buffer stock norms of 13.5 MT. This excess stock should be unloaded by Food Corporation of India in the open market at reasonable prices. This will cool down the food inflation.
- **Reduced Dependence on Fuels**: The Government should continue to work to increase share of renewable energy in the energy mix. It will reduce dependence on imported fuels, which induce price volatility.
- **Adjustment of CPI Index**: The weight of food and beverages in the CPI basket should be adjusted to reflect current realities as the weights are based on the 2011 consumption survey.

> **Headline and Core Inflation**
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> Headline inflation is a measure of the total inflation within an economy, including commodities such as food and energy prices. **Food and Energy prices tend to be much more volatile** and prone to inflationary spikes. It is **reported through CPI in India**.
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> Core inflation is the persistent component of inflation in India. It adjusts for volatile, transitory movements from the CPI. It is measured by **removing Food and Fuel categories from CPI**.
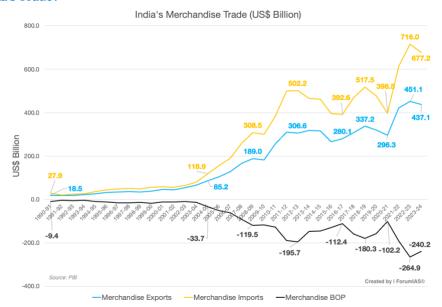
4. Challenges in India's Foreign Trade

News: Foreign Trade is crucial to India's economic growth. The Government must take steps to address the bottlenecks faced by Indian traders.

What is the current status of India's Trade?

- **Global Share**: India's share in global merchandise exports was only 1.8% in 2023.
- This is significantly lower than China (14.2%) and US (8.5%).
- **Export Decline**: In FY 2023-24, India's merchandise exports witnessed a decrease of 3.1%.
- **Services Sector**: India is the 7th-largest exporter of services globally, showing resilience amidst global economic fluctuations. However, growth rate of services exports fell to 3-year low of 4.9% in 2023-24.

India's Merchandise Trade (US$ Billion)

Source: PIB

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— Merchandise Exports — Merchandise Imports — Merchandise BOP

What is the importance of trade (exports) for India's Growth?

- **Boosts Aggregate Demand**: International trade drives aggregate demand, which is essential for economic growth.
- **Reduces Dependence on Foreign Savings**: Higher exports decrease reliance on foreign savings.
- **Job Creation**: Expanding exports generates jobs for India's growing workforce.

What are the challenges associated with India's exports?
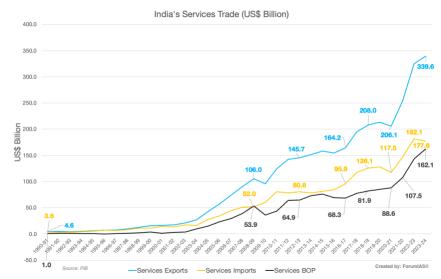
- **Decline in Labour-intensive Exports**: Exports from labour-intensive sectors such as garments, textiles, leather products, footwear, diamonds, and gold jewellery were lower in 2023 than in 2015. Bangladesh and Vietnam have surpassed India in many of these sectors by adopting strategies such as using imported fabric for garment manufacturing.
- **Lack of Diversification in Service Exports**: 75% of India's service export earnings come from 2 sectors: Software & IT and Business Services. In contrast, India holds a smaller global share (1.9%) in other service sectors such as transport, travel, maintenance and repair, insurance, financial services, and intellectual property use.
- **Overdependence on Imports from China**: China accounts for ~30% of India's imports in industrial products like telecom equipment, electronics, chemicals, and pharmaceuticals. This has resulted in a large trade deficit with China, exceeding US$ 387 billion cumulatively over 6 years from 2019 to 2024. Despite avoiding RCEP, India has not been able to reduce its reliance on Chinese imports.
- **Impact of Inverted Duty Structure and FTAs**: Free Trade Agreements (FTAs) have created an inverted duty structure where **import duties on finished goods are lower than those on raw materials**. This hampers local manufacturing efforts.
  - High tariffs reduce the competitiveness of domestic manufacturers, especially affecting the SMEs.
  - India is not part of significant trade agreements like the Regional Comprehensive Economic Partnership (RCEP), limiting its **integration into global value chains**.

- **Quality Concerns**: Indian exports, especially food and agricultural products, face rejections from markets such as the EU and US. This is due to quality issues like surpassing **Maximum Residue Limits** (MRLs) for pesticides and other quality-related problems.
- **European Climate Regulations**: Regulations such as the EU's deforestation rules, Carbon Border Adjustment Mechanism (CBAM), foreign subsidies regulation, and German Supply Chain Due Diligence Act may harm India's exports to the EU and create uncertainty.

What should be the way forward?

- **Reviving Labour-intensive Exports**: Sectors such as garments, textiles, leather products, footwear create more jobs per unit of investment compared to others. The Government should address the challenges faced by these sectors on priority.
- **Diversifying Service Exports**: The Government must make efforts to enhance share in other services like transport, travel, maintenance and repair, insurance, financial services, and intellectual property to achieve a stable service export performance.

India's Services Trade (US$ Billion)

- **Reducing Dependence on China**: The US, EU, and Australia are implementing measures to decrease imports from China. India must conduct a strategic review, **diversify its sources of imports**, and **strengthen its domestic production capabilities**.
- **Addressing Issues with FTAs**: The rise in FTAs has made things more complex by enabling **zero-duty imports** on many industrial products. This **encourages imports over local purchases**. The Government should ensure that FTAs do not worsen the inverted duty structure.
  - The Government should publish data on the performance of India's 14 comprehensive FTAs and 6 PTAs (Preferential Trade Agreements) to assess their effectiveness and aid ongoing trade negotiations.
- **Countering European Climate Regulations**: India should develop a strategy to respond to EU regulations and possibly reduce imports from the EU in an equal measure.
- **Improving Quality Systems**: To address concerns raised by Hong Kong, Singapore, and the US regarding the quality of spices from leading Indian brands, India should **align its quality standards with international norms**, expand farm-to-fork blockchain tracing for major exports, issue **quality control orders** in consultation with industry, and establish mutual recognition agreements with key export partners.
- **Ease of Doing Business**: Improving the Government-business interface to focus more on businesses, setting up a user-friendly online National Trade Network for compliance, investing in modern ports, efficient logistics, and digital systems can make doing business easier and increase exports.
- **Other Export Promotion Measures**: The Government should promote export of high-value goods to current markets, assist small businesses in expanding globally, enhance their access to finance, encourage e-commerce exports, and reduce non-tariff barriers in critical markets.
- **Invest in Human Capital:** Services exports rely on skilled workers. Larger investments in education, training, and research are needed. India saw a 60% increase in global capability centers from 2015-16 to 2022-23.

- **Diversify Export Destinations**: The Government must work to reduce reliance on the US and Canada, which account for over half of India's services exports, to mitigate economic risks.

5. Concerns Regarding Credit Growth in India

News: Economists have expressed concerns regarding rapid credit growth in India. Excessive borrowing by households can create risks leading to financial crisis in the long run.

What is the current state of credit growth in India?

- India is experiencing **rapid credit growth**, particularly in the **household sector**, which is rising at an annual rate of **25% to 30%**. *(Refer EPIC May 2024 for Concerns Related to Household Savings in India)*.
- A review by the National Council of Applied Economic Research in March 2024 noted a 20% increase in bank lending from the previous year, with a significant **rise in personal loans**.
- The credit expanded by INR 26.6 lakh crore in FY2023-24, reaching a total outstanding credit of INR 164.3 lakh crore as of March 31, 2024 (by Scheduled Commercial Banks).
- The surge in lending is primarily directed towards **consumer spending** instead of productive investments, contributing to economic vulnerabilities.

What are the risks associated with the rapid credit expansion?

- **Financial Instability**: Historically, rapid credit growth has led to financial crises. Previous booms ended when new loans couldn't cover old debts.
- **Unsecured Borrowing**: ~25% of household loans are unsecured, increasing financial system stress. The number of credit cards surged from 20 million cards in 2011 to 100 million in 2024.
- **Economic Contraction**: High debt-burden reduces household spending, leading to economic slowdown. Indian households' **debt-service-to-income ratio** is 12%, one of the highest globally. *(The ratio indicates proportion of gross income used to pay interest on debt i.e., 12% income is expended in interest payments)*.
- **Inefficient Lending**: Financial institutions are focusing on consumer loans instead of productive investments. This can lead to economic downturns when consumer spending slows.

What should be done?

- **Financial Regulation**: Strengthening oversight is necessary to **prevent rogue behavior** among financial institutions. The rise in unsecured loans indicates a poorly regulated financial sector. Fintech companies have led the charge in offering high-interest loans to households, contributing to financial stress. A lot of NBFCs and new fintech companies have operated in dubious ways.
- **Credit Rationalization**: Sudden stop in credit could trigger a crisis. There is a need to gradually downsize the financial services industry to better **match lending capacity and productive borrowing needs**. The policymakers should follow the notion that finance must follow growth, rather than the approach that finance will spur growth. *(Refer EPIC March 2024 for Fintech Sector in India, EPIC November 2023 for Regulating Digital Lending in India and EPIC September 2023 for Self-Regulation of Fintech)*.

6. The Need to Change India's Approach to Energy Policymaking

News: Experts have called for adopting an integrated approach to energy policymaking in India. A holistic approach to energy management will smoothen the transition to renewable energy while ensuring energy security.

What is the current energy policy in India?

- India's energy policy is **dual-pronged**, focusing on both **fossil fuels** and **renewable energy**.

- The fossil fuel strategy emphasizes **reducing dependence on imports** of oil and petroleum through **diversified import sources**, **strategic reserves**, **domestic exploration**, **demand conservation**, efficiency, and environmental protection.
- The renewable strategy is aimed at **accelerating the shift to clean energy**, with a long-term goal of Net-zero carbon emissions by 2070 and a medium-term target of generating 500 GW from non-fossil fuels by 2030.

What are the challenges in the current structure?
- The current structure of India's energy policy is **highly compartmentalized**.
  - **Multiple Ministries deal with the energy sector** like Petroleum, Coal, New and Renewable Energy, Power, Heavy Industry, Mines and Minerals, and Environment.
  - Each Ministry operates within narrow and rigid boundaries making **coordination and streamlined decision-making challenging**.
  - The objectives of Ministries may sometimes be in conflict with each other e.g., the Ministry of Coal promotes coal usage, whereas the Ministry of Renewable Energy advocates for reduced coal dependence. This misalignment affects formulation of a coherent energy policy.
- There is no formal executive **forum for integrated discussions on energy policy**. This hampers India's ability to meet its publicly announced decarbonization and sustainability targets.

Why there is a need to rethink approach towards energy policymaking?
- There is **rising geopolitical uncertainty** with differences rising between the US/West and China/Russia. The **great power competition** is reminiscent of the Cold War and **ensuring energy security under volatile global circumstances** becomes imperative.
- **China has a near monopoly on essential materials** required for green energy technologies. Its dominance in producing low-cost solar wafers and wind turbines can affect India's long term energy security.
- The **supply chain vulnerabilities to external shocks** like COVID-19 pandemic, necessitate diversification of energy sources.
- **Climate Change** is becoming apparent and India is one of the worst affected due to erratic rainfall, extreme heatwaves, adverse weather events like cloudbursts etc. There is a need to **accelerate green transition** and expand the scope of climate action.

What should the be done by the Government?
- **Single Ministry**: There is a need to adopt a unified approach and a single **Ministry of Energy** should be established. It may have **multiple departments** like for fossil and non-fossil fuel based energy sources. This will help in having a holistic approach to energy related issues.
- **GoM for Energy Transition**: The Government can establish a Group of Ministers to coordinate climate action and energy transition policies.
  - Similarly, a **Parliamentary Committee on Energy Transition** should be established for Legislative oversight over the Ministry and Regulators. The Committee should be supported by research organizations related to climate change, action and green technologies.
- **Regulators**: The sector should have a **unified regulator with multiple departments** for better coordination on contentious issues like tariff rates etc.
- **Energy Strategy Vision Document**: The Government should **prepare a vision document on Energy**. It should address aspects related to **energy security** and **sustainability**. It should guide efforts related to securing supplies related to critical minerals for energy transition or developing critical technologies. The document should replace the **Integrated Energy Policy 2006** and the **Draft National Energy Policy**, **2017**.

7. The Role of Officers of the Indian Forest Service

News: The President of India recently addressed the Convocation ceremony of the 2022 Batch of Indian Forest Service. She emphasized the role of the Forest Officers in biodiversity conservation and need to adapt the service to new challenges.

What are the major roles of the Indian Forest Service Officers?

- **Conservation of Biodiversity**: IFoS officers are crucial for the protection and conservation of biodiversity. They work to preserve various ecosystems, forests, and wildlife.
- **Preservation and Expansion of Forests**: They are involved in afforestation and reforestation projects, using modern methods like the Miyawaki technique to accelerate forest growth in urban and rural areas.
- **Role Models in Conservation**: Officers like P Srinivas, Sanjay Kumar Singh, and S Manikandan, who sacrificed their lives in the line of duty, serve as inspiring examples of dedication to environmental conservation.

What are the emerging challenges in forest conservation?

- **Development**: The goal to make India a developed nation by 2047 has put pressure on the forest resources. Forest areas are getting diverted for development projects.
- **Human-Animal Conflict**: Shrinking habitats, reduced prey base and human encroachment in wild areas has led to an increase in incidents of human-animal conflict.
- **Illegal Poaching**: Incidents of poaching continue due to huge demand for exotic animal products in the domestic and international markets.
- **Forest Fires**: Climate change and human activities have worsened the frequency and intensity of forest fires.
- **Exotic Species**: Rising human activities in forest areas has introduced exotic species in new areas which disturb the local ecology.

What should be the approach of Forest Officers in face of new challenges?

- **Integration of Traditional and Modern Knowledge**: Forest Officers should use both traditional knowledge from tribal communities and modern scientific methods. This integration will help protect ecosystems and support sustainable development.
- **Uphold Rights of Tribal Communities**: The Officers must protect the interests and rights of indigenous peoples, ensuring their equal participation in development and conservation efforts.
- **Adherence to Constitutional Values**: The Officers should make decisions based on the principles of the Constitution and in the best interests of the citizens, ensuring fairness and justice in their actions.
- **Focus on Climate Change**: Given the urgency of the climate crisis, training should emphasize on climate change mitigation and adaptation strategies.
- **Curriculum**: The curriculum should be updated to include modern scientific methods and technologies. For example, using artificial intelligence tools to identify optimal areas and species for afforestation can enhance the effectiveness of conservation efforts.

8. The Issue of Eco-Sensitive Areas in Western Ghats

News: Goa, Karnataka and Maharashtra have sought reduction in the extent of Eco-sensitive Areas in the Western Ghats in order to allow development works.

What are the Ecologically Sensitive Areas (ESA) in the Western Ghats?

- The **Western Ghats Ecology Expert Panel**, **2011** (WGEEP, headed by Madhav Gadgil) had proposed to **declare entire Western Ghats as Ecologically Sensitive Area** (ESA).

- The panel had assigned **three levels of Ecological Sensitivity** to different regions of Western Ghats, termed as **Ecologically Sensitive Zone 1**, **2** and **3** (ESZ1, ESZ2 and ESZ3).
- It advocated **graded or layered approach** with **maximum protection** (and restrictions) **in ESZ1** (all development activities restricted) and **gradually relaxed standards** in **ESZ2** and **ESZ3**.
- However, the Report was criticized as '**too focused**' on **environment protection** and not in tune with ground conditions.
- **Kasturirangan Committee** (2013) sought to **balance environmental conservation with development needs**. It recommended **37% of the areas under Western Ghats to be declared Ecologically Sensitive Area** (ESA) in 6 States: Kerala, Tamil Nadu, Karnataka, Goa, Maharashtra, and Gujarat.
- It recommended to **completely restrict certain polluting activities** like mining within ESA. Projects like hydro-power could be allowed only after detailed studies.

Source: WGEEP. The extent of Western Ghats as identified by the WGEEP.

What has been the response of the States?

- The States recognized the need to protect the Western Ghats. But all States expressed concerns regarding restriction on activities in ESA and the impact on economic development.
- The States have argued for **rationalization of area under ESAs** to facilitate development works.
- Karnataka had opposed the Kasturirangan report citing **adverse impact on livelihoods of the local people**.

What are the concerns associated with ESAs?

- **Development Concerns**: ESAs restrict development activities which are essential for economic growth e.g., construction of hydropower projects for energy generation.
- **Impact on Livelihoods**: Regulations in ESAs can restrict traditional activities of local residents. This can lead to resentment in the local communities. Residents of proposed ESA, especially in Kerala, are protesting against ESAs.
- **Consistent Implementation**: The policy implementation related to ESA can vary across States. It leads to challenges in implementation.
- **Awareness and Participation**: Local Communities are not involved in the demarcation, declaration process of ESAs. As a result it leads to misinformation and resistance.

What should be the approach?

- **Balanced Approach**: The need for **ecological integrity** should be **balanced with development needs** ensuring sustainable development. Zones can be established within ESAs with **layered approach** of stricter regulations and more relaxed standards.
  o The rise in frequency of landslides indicates the need for regulating the development activities in the Western Ghats.
- **Scientific Approach**: Evidence based decision-making based on scientific parameters can be used to demarcate ESAs and remove the need for unnecessary restrictions on development.

- **Participatory Approach**: Locals should be included in the decision making process regarding demarcation of ESAs and their concerns related to livelihoods should be addressed.
- **Rehabilitation**: The residents who have to be displaced or put under restrictions, should be suitably rehabilitated or provided with alternate livelihood opportunities.

9. The Issue of Urban Fire Hazards in India

News: The fire incidents in a Gaming Zone in Rajkot and a child hospital in Delhi indicate poor status of fire safety in India.

What are Urban Fires? What is the status of Urban Fires in India?
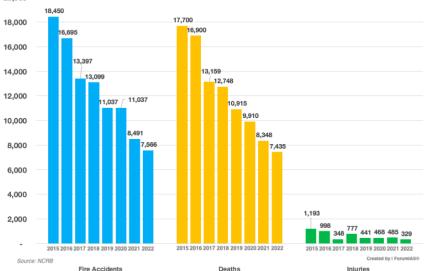
- They refer to fire incidents occurring in the urban areas which are densely populated and have a high concentration of buildings, infrastructure, and human activities.
- India has regularly witnessed big urban fire incidents like Uphar Cinema (Delhi, 1997), Kamala Mills (Mumbai, 2017), Taxila Coaching Centre (Surat, 2019), Mundka Fire Incident (Delhi, 2022).

Status of Urban Fires in India

- According to the National Crime Records Bureau (NCRB) data 2022, India witnessed

7,566 fire incidents and 7,435 deaths in such incidents.
- In 2015, NCRB had reported deaths of 17,700 persons due to fire accidents. There has been a declining trend in fire related incidents. Maharashtra and Gujarat accounted for a significant portion (~30%) of the country's fire-related deaths.
- The India Risk Surveys 2018 has placed India at 3rd position in fire incidents. This signifies the grave risks of fire incidents in urban habitats.

What are the common causes of urban fires in India?

- **Electric Malfunctions**: Loose wires, overloaded plugs, old equipment and highly inflammable Polyurethane foam (PUF) used for plastic insulation have contributed to the increase in urban fire accidents in the country.
- **Human Errors**: Human errors such as improper handling of inflammable liquids/items in the kitchen, overheating of LPG cylinders due to improper storage etc. can led to incidents of fire.
- **Lack of Awareness**: The lack of knowledge and training among common people to operate the installed firefighting equipment in the building premises leads to small fire incidents transforming to big fire disasters.

What are the issues with urban fire management in India?

- **Non-adherence to National Building Code (NBC)**: The NBC has set out elaborate guidelines for fire safety in buildings. However, the adherence to these codes has been lacklustre in India. As an example, most old buildings lack a separate fire escape staircase. Similarly, **fire audits** are not undertaken on a regular basis.

- **Poor Adoption of Model Fire Safety Bill**: Many States have failed to adopt the provisions of the Model Fire Safety Bill 2019, drafted by the Union Government for maintenance of fire and emergency services.
- **Resource Crunch**: Fire safety operations in urban India are generally under the jurisdiction of the municipal corporations. The firefighting operations are financially, infrastructurally and technologically starved of resources. India had only 39% of the 8,559 fire stations needed in 2018.
- **Regulatory Laxity**: The municipal corporation, civic development authorities and planning control commissions have been lax in the effective implementation of fire safety regulations.
- **Lack of Robust Fire Mitigation Technologies:** Most of the modern buildings in major cities lack sufficient in-built **fire safety measures** such as **smoke alarms** and **sprinkler systems**. These systems operate as **early warning systems** and **fire control measures**.

What are the provisions regulating Urban Fires in India?

Measure	Details
Fire Service Regulation	• Fire service falls under the **12th Schedule of the Constitution** dealing with Municipal functions. • The fire prevention and firefighting services are organized by the concerned States and Union Territories (UTs), and Urban Local Bodies (ULBs).
National Building Code (NBC) of India, 2016	• NBC is a recommendatory document published by the **Bureau of Indian Standards**. • It mainly contains administrative regulations, general building requirements such as **fire safety requirements**, structural design and construction (including safety) provisions. • State Governments are expected to incorporate the provisions of the Code into their **local building by-laws**.
Model Building By-Laws, 2004, 2016	• Under Model Building By-Laws, fire clearance is the responsibility of the Chief Fire Officer at each point. • The concerned Development Authority must provide the building plans to the Chief Fire Officer for clearance purposes.
National Disaster Management Authority (NDMA) Guidelines	• These Guidelines stipulate fire safety requirements for public buildings and include design guidelines relating to maintaining a minimum level of open space, exit mechanisms, stairs and evacuation drills.

What should be the way forward?

- **Enactment of Fire Act in every State**: Every State should enact a Fire Act based on the 2019 Model Bill.
- **Adherence to Fire Safety Standards**: The Home Ministry must make sure that National Disaster Management Authority Guidelines on Scaling, Type of Equipment and Training of Fire Services are duly followed by the States.
- **Regular Auditing**: There should be **time-bound fire and electric audits** of all hospitals and other important public buildings within the municipal area. Moreover, the Government must conduct third-party **fire safety audits** throughout the urban areas.
- **Mock Drills**: The fire services must conduct regular fire safety drills so that people are aware of what to do in the event of a fire incident.
- **Awareness**: Emphasis must be placed on creating awareness among different stakeholders like citizens, administrators, politicians, builders, engineers, regarding the importance of fire safety management.

- **Infrastructure and Technology**: Adoption of modern technology such as water mist and drones and simple interventions like constructing water storage tanks at suitable locations can help in effective firefighting.
- **Financial Support**: The Government should provide financial support and assistance in augmenting and modernizing the fire departments.
- **Abiding by the Rules**: All buildings in the city must abide by the model building by-laws that safeguard aspects of liveability, safety and sustainability of its users.

10. The Concerns Regarding the *Agnipath* Scheme

News: *Agnipath* Scheme has been criticized, including by armed forces veterans, because of several reasons. Reports suggest that the Government and Army are reviewing the scheme and may alter some aspects.

What is *Agnipath* Scheme?

- It is a short-service manpower model under which ~45,000 to 50,000 soldiers will be recruited annually. Of these, **75% will leave the service in 4 years**. 25% will be allowed to continue for another 15 years under permanent commission. The soldiers trained under the Scheme are called **Agniveers**.

- Its broad adjective is to **enhance the youthful profile of the Armed Forces** so that they are at their best fighting abilities. It also intends to bring in young talent who can **effectively use new technologies** and have higher technical skills, using the country's technical institutions.

- To provide suitable opportunities after 4 years, the armed forces professionals will be preferred for vacancies under various Ministries under the Union and State Governments.

Central / State Government	Incentive
Ministry of Home Affairs	10% reservations in vacancies of the Central Armed Police Forces (CAPF) and Assam Rifles (AR) Relaxation of the upper age limit by three years (five years for the first batch of Agniveers) in recruitments to the CAPF and AR
Ministry of Defence	10% reservation in jobs in the Indian Coast Guard, defence civilian posts, and 16 Defence Public Sector Undertakings (DPSUs)
Ministry of Ports, Shipping and Waterways	Job opportunities for Agniveers in six sectors of the merchant navy
Ministry of Education	Special educational programme to enable Agniveers who finished 10th Class to obtain 12th Class pass certificate
Government of Assam	Assam Police to absorb Agniveers who are permanent residents of the State
Governments of Uttar Pradesh, Haryana and Madhya Pradesh	Priority in recruitment in state police forces

What is the significance of *Agnipath* Scheme?

- **Leaner and Younger Force**: The scheme will make the armed forces leaner. The Scheme is expected to lower the average age of the forces from 32 years to 26 years within 6-7 years from the launch (2022).
- **Budget for Modernization**: Pay and Allowances (P&A) and pension form a major chunk (>50%) of the defense budget. With leaner force, this share will come down. The freed amount can be spent on acquisition of **advanced equipment** and **modernization of the forces**.
  - Globally, armed forces are focusing on **reducing absolute strength** (in terms of manpower) while modernizing the forces. China's People's Liberation Army (PLA) has brought down total number of troops from 4.5 million to ~2 million.
- **Rotation of Troops**: The scheme aims to rotate soldiers more frequently by having shorter terms. This prevents stagnation and brings in new talent and skills regularly, ensuring a disciplined rotation of troops.
- **Reserve Force:** The ex-*agniveers* could act as an ad hoc buffer force who may be called to serve again for boosting national security in times of external/internal threats.
- **Skilled Workforce**: The *Agniveers* will contribute to skilled workforce for various sectors, given their disciplined training and exposure

What are the concerns associated with *Agnipath* Scheme?

- **Opposition**: The *Agnipath* Scheme has been opposed by various sections including the youth (potential recruits), ex-servicemen and political parties. Their concerns are related to job security, pension benefits, and future prospects of the *Agniveers* after their 4-year tenure.

- **Capability Drawbacks**: *Agniveers* undergo limited training of 6 months. Veterans express concerns that handling weapons and ammunition etc. require much greater time and training, and 6 months are too short.
- **Unhealthy Competition**: Retention of only 25% has led to an unhealthy competition among them with *Agniveers* trying to get ahead of their fellow soldiers (in order to get extension). There are concerns that this will **weaken unit cohesion** and **combat effectiveness** as the sense of sacrifice among soldiers will be missing. It can **weaken the morale of the forces** which is the most vital aspect in the battlefield.
- **Appeal for Career in Armed Forces**: For many soldiers, the reason for career in armed forces is the respect, recognition, gratitude, and fair compensation for their sacrifices for the nation. If *Agniveers* feel they don't get adequate support after leaving the military, the appeal for career in uniform and armed forces may decrease.
- **Recruitment by Inimical Elements**: Several experts have expressed fears that discharged *Agniveers* could be hired by inimical forces like Naxalites, insurgents for nefarious purposes. It can also lead to **militarization of the society**.

India has more troops than China but far fewer aircraft and vessels

Country-wise comparison in 2021

		Ground forces (mn)	Naval vessels ('000 tonnes)	Combat aircraft
◉	India	1.24	460	880
☭	North Korea	1.10	110	550
★	China	0.97	2,120	2,900
	US	0.67	7,290	3,520
	Pakistan	0.56	100	440
	Iran	0.50	160	340
	South Korea	0.46	260	640
	Russia	0.33	2,020	1,380
●	Japan	0.14	510	350
✡	Israel	0.13	20	350

Source: Mint. India has largest number of ground-forces. India lags far behind China in naval vessels and combat aircraft.

- **Operational Impact**: The replacement of Class-Based Recruitment with All-India All-Class Recruitment could harm the armed forces because it affects their managerial and **operational efficiency**.
- **Training Infrastructure**: A constant inflow of new *Agniveers* every year will require significant improvement in training capacities and infrastructure to accommodate their training requirements.
  - The scheme will require **augmentation and strengthening of the administrative machinery** to handle the increased recruitment, periodic release after 4 years, and retention of 25% of the *Agniveers* for longer service.

What should be done?

- **Raise Age Limit and Retention**: Indian Army has proposed extending the service period from 4 years to 7-8 years for *Agniveers* and increasing the retention from 25% to 60-70%.
- **Fostering Unit Cohesion**: To enhance unit pride and cohesion, there should be focus on nurturing human element and individual character development. It forms the foundation of discipline and teamwork which is essential for battlefield strength and unit camaraderie.
- **Enhanced Entitlements & Benefits**: They should be covered under contributory pension and generous gratuity scheme. Ex-gratia should be provided for disability during training. Moreover, if an *Agniveer* dies in war, their family should receive a subsistence allowance. An *Agniveer* from Maharashtra who was martyred in Siachen in 2023, received ~ INR 1.08 crore from the Government of India. This is commendable.
- **Skilling and Resettlement**: Developing robust skilling and resettlement programs in collaboration with the private sector and other Government agencies could help ensure a smooth transition for *Agniveers* into civilian life after their tenure.
- **Psychological Testing**: A psychological test can be made part of the recruitment process similar to that used in the selection of officers. This will help unit commanders manage human resources better and facilitate the grooming and assessment of *Agniveers*.

Factly

Polity

1. The Doctrines of Merger and Stare Decisis

News: The SC has observed that the extraordinary powers under Article 142 of the Constitution are an exception to the Doctrines of Merger and Stare Decisis, to do complete justice between the parties.

About Doctrine of Merger
- The Doctrine of Merger aims to maintain decorum and orderliness in the judicial system.
- According to the Doctrine, when a higher court (appellate court) makes a ruling, the original ruling by the lower court is absorbed or "merged" into the higher court's decision.
- The Doctrine ensures that **only one final ruling exists on any given issue**, avoiding confusion over which order should be followed (in case of multiple orders on the same issue).
  - The **ruling of a higher court supersedes and absorbs that of a lower court**.
- The Doctrine applies to decisions made by all levels of courts.

About Doctrine of Stare Decisis
- 'Stare Decisis' is Latin for "**to stand by things decided**". The Doctrine mandates that courts follow the rulings made in earlier similar cases.
- **Past decisions serve as precedents**, which are principles or rules that guide judicial decisions in future similar cases.
  - The precedents are used by judges as references for making decisions in current cases with similar legal questions.
- Courts are obligated to consider these precedents in their rulings. It helps **maintain consistency and predictability in the law**.

The two Doctrines collectively ensure that the legal system operates efficiently, maintaining consistency and hierarchy in judicial decisions. *(Refer EPIC May 2023 (click) for Use of Powers Granted to the Supreme Court under Article 142).*

2. The Status of NOTA in Elections

News: Indore Parliamentary Constituency registered the highest ever NOTA votes at 218,674. Overall, NOTA vote share stood at ~1% in the General Election 2024 with ~63.7 lakh votes (all-India level).

About the Introduction of NOTA
- The NOTA (None of the Above) option in the ballot was introduced to allow voters to **reject all candidates**, enhancing **voter freedom** and **secrecy**.
- **Rule 49-O** of the **Conduct of Election Rules**, **1961** required a voter to **inform the Presiding Officer** if she chose to not vote for any candidate. Earlier in the ballot paper system, the voter could have put stamp on multiple candidates to **get her vote nullified**. This was not the case with EVMs.
- In *People's Union For Civil Liberties vs Union Of India (2013)*, the Supreme Court held that the **Rule 49-O violated the secrecy of the ballot** as the voter had to reveal her identity if she decided to not vote for any candidate. The SC disagreed with the Government's argument that only active voters deserved secrecy.
- The SC asked for **NOTA option to be put in the ballot papers** in order to **ensure secrecy of such voters**.

Status of NOTA
- NOTA has had a limited impact in its present form. **NOTA is not equivalent to right to reject**.

- In the General and State Assembly Elections, if NOTA receives the highest number of votes, it does not alter the electoral outcome as **there is no re-election**.
  - o **The candidate with the next highest number of votes is declared as the winner**.
- Some State Election Commissions (Maharashtra, Haryana, Delhi, Chandigarh and Puducherry) have passed orders, treating NOTA as a '**Fictional Electoral Candidate**' in local body elections. If NOTA receives more votes than any candidate, **the elections are declared null**, **necessitating a re-election**.
- A petition has been filed in the SC asking for directions to the Election Commission to **reconduct election in a Constituency if NOTA receives highest votes** among all candidates.
- It will make the NOTA option more potent. In the current form, it has **failed to enhance voter participation** (turnout) or **improve the quality of candidates** fielded by the political parties.

3. Limitation on the Role of Judiciary in the Electoral Process

News: A petition was filed in the Supreme Court to direct the Election Commission to publish booth-wise voter turnout. The SC adjourned the hearing citing ongoing election process. The Election Commission had invoked Article 329 that prohibits judicial intervention in the working of the Commission during elections.

About Article 329

- Article 329 is part of **Part XV of the Constitution**. The Article limits the interference by courts in electoral matters.
- Article 329(a) restricts the judiciary from questioning the validity of a **law relating to delimitation of constituencies** or **allocation of seats to such constituencies**.
- Article 329(b) (as amended by the Constitution (19th Amendment) Act, 1966), states that elections to either House of the Parliament or State Legislatures can only be challenged through an **election petition** as outlined by law.
- The **Representation of the People Act**, **1951**, specifies that **High Courts** are the authorities **empowered to hear and decide election petitions**. Decisions from these petitions can be appealed to the Supreme Court.

Related Supreme Court and High Court Judgments

- *NP Ponnuswamy vs Returning Officer, Namakkal (1952)*: The SC clarified that the term 'election' in Article 329(b) **encompasses the entire electoral process**, from the notification of election to the declaration of results. It established that the **courts cannot interfere with the electoral process** once it has begun, until its completion.
- *Inderjit Barua vs Election Commission of India (1985)*: The SC **excluded electoral roll preparation** from the definition of 'election'. It further said that no election could be challenged on the grounds of defects in electoral rolls.
- *Venkatachalam vs. A. Swamickan (1999)*: The SC determined that Article 329(b) does not apply to matters related to Articles 191 and 193, which deal with disqualifications and penalties for members of Legislative Assemblies.
- *Hari Krishna Lal vs Atal Bihari Bajpai (2002)*: The Allahabad High Court clarified that only candidates officially recognised by the Election Commission are eligible to file election petitions.
- *NC Patel vs State of Gujarat (2007)*: The Gujarat High Court affirmed that election petitions can only be filed under the Representation of People's Act, 1951, and **not by way of a writ petition**.

4. Supreme Court's Judgment on Promises Made in Electoral Manifestos

News: The SC has held that there is nothing corrupt about promises made in a political party's manifesto that eventually work out to the public's financial benefit.

About the SC Judgment

- An **election petition** was filed in the **Karnataka High Court** against the election of the candidate from the Chamrajpet Assembly Constituency. The petition had contended that the **promises and guarantees made in the electoral manifesto of the elected candidate amounted to corruption**.
  - o The petition had questioned the guarantees like INR 2,000 monthly assistance to women heads of all families, 200 units of power to all households, 10 kg rice per person per month and free travel for women in the state public transport buses.
- The **Karnataka HC had rejected the petition** and an appeal was filed in the Supreme Court.
- The SC has held that **making promises in election manifestos is not inherently corrupt**, even if these promises may lead to financial benefits for the public.
- The **SC rejected the plea** stating that since the **allegations of corrupt practices are not against the candidate** himself, they cannot interfere with the plea.
- However, the SC noted that the issue was of great importance. The SC observed that **no enactment directly governs the contents of the election manifesto**. *(Refer EPIC August 2022 (click) for The Issue of Freebies)*.
- The Court **directed the Election Commission to frame guidelines** for the same in consultation with all the recognized political parties, just like the guidelines have been framed under the Model Code of Conduct.

5. Section 436A of Criminal Procedure Code (CrPC)

News: Section 436A is related to provision of bail for the undertrials.

About Section 436A of CrPC, 1973

- Section 436A was added to the Code of Criminal Procedure, 1973, through an **amendment in 2005**. It focuses on undertrials. Undertrials are individuals still awaiting trial and are not convicted yet.
- According to Section 436A, **if an undertrial has been detained for a period that equals half the maximum sentence possible for the crime they are accused of** (except for crimes punishable by death), **then they are eligible to be released on bail**.
- The release can be on their personal promise to return to court, known as a **personal bond**, and may or may not include a **surety**. Surety is a **guarantee by another person**.
- However, the court can decide to keep the person in detention for longer than half the maximum sentence if there are reasons to do so. These reasons must be written down after hearing from the Public Prosecutor.

About the Protections for Undertrials

- **Statutory Bail** is granted under Section 436A of the CrPC.
- If someone is accused of a **bailable offense**, the court must grant them bail if they agree to pay **bail bond**.
- For **non-bailable offenses**, the **decision to grant bail is up to the court**.
- Under **Section 167(2)** of the CrPC, **Default Bail** is granted if the police fail to file a charge sheet within the stipulated time (60 days for lesser offenses, 90 days for severe offenses). This provision underscores the **rights of the accused against undue detention**.
  - o This helps to prevent people from being held in jail for a long time without trial. However, this only applies to crimes listed under the Indian Penal Code (IPC).

6. Foreigners Tribunal

News: The Supreme Court has stopped the deportation of a woman who had been declared a foreigner by a Foreigners Tribunal in Assam.

About Foreigners Tribunal

- Foreigners Tribunals are established under the **Foreigners (Tribunals) Order**, **1964**, which was enacted by the Union Government utilizing powers from **Section 3 of the Foreigners Act**, **1946**.
- FTs are **applicable across India** but are **operational only in Assam** at present. In other States, suspected illegal immigrants are **presented before local courts** under the Foreigners Act, 1946.
- Earlier, only the Union Government could establish FTs. In 2019, an Amendment to the Foreigners (Tribunals) Order granted this power to State Governments as well.

Role and Functions of FTs

- **Detection of Suspected Foreigners**: The Superintendents of Police (SPs) and District Commissioners identify suspected foreigners.
- The Election Commission of India can also refer cases of '**doubtful**' **voters** to the local SP, who then refers them to the FTs.
- **National Register of Citizens (NRC)**: Individuals excluded from the final draft of the NRC released in August 2019, can appeal to the FTs to establish their citizenship.

Procedures Followed by FTs

- **Issuance of Notices**: Upon receiving a referral, the tribunal serves the suspected individual with a copy of the **grounds of suspicion** and a **show-cause notice** within 10 days. The **burden of proof lies with the individual** to demonstrate that (s)he is not a foreigner.
- **Opportunity for Defense**: The FT provides the individual a **fair chance to make a representation** in person or via a lawyer and to present evidence supporting their claim of citizenship.
- **Consequences of Non-Compliance**: If the individual fails to prove their citizenship and cannot secure bail, the FT orders their detention and transfer to a detention center.
- **Legal Authority and Precedence**: The SC has held that the decisions of the FTs on a person's nationality are binding and hold more weight than those of the Government, the NRC verification authority, or any other credentials.

7. Supreme Court Judgments on Rights of Persons Accused of Crime

News: Two recent Judgments of the Supreme Court have direct impact on the rights of person accused of crimes.

About SC Judgments

Siddharth v. State of Uttar Pradesh (2021): Custody Not Required Before Filing of Charge Sheet

- The SC has ruled that there is no need for the accused to be present at the filing of the charge sheet if the accused has been **cooperating in the investigation** and if the **investigation can be completed without arresting the accused**.
- The Court highlighted that **Section 170 of the CrPC** does not mandate custody for filing charge sheets.
- The SC directive **removes the need for unnecessary detentions**, easing the burden on both investigating agencies and the accused. (*Refer EPIC February 2023 (click) for Issues Related to Prisons and Prison Reform and EPIC December 2022 (click) for The Issue of Undertrials in India*).

Prabir Purkayastha v. State NCT of Delhi (2024): Mandatory Written Grounds of Arrest

- The SC emphasized that **informing the accused in writing about the grounds of arrest** is a **Constitutional right under Article 22**.
- The Court reiterated its opinion in *Pankaj Bansal v. Union of India (2023)* that the reasons for arrest must be documented in writing to **uphold due process and transparency**.
- In *Prabir Purkayastha* the SC also held that the **principle is equally applicable to UAPA**.

- The mandate to provide written grounds of arrest **enhances transparency and protects constitutional rights** under Article 22 of the Constitution. The SC emphasized that written grounds help the accused seek legal counsel and bail, **ensuring fair legal proceedings under Section 50(1) of the CrPC**.

Policy

1. AMRUT 2.0 Programme

News: Projections indicate that 50% of India's population will reside in cities by 2047. AMRUT Programme is targeted towards making the process of urbanization sustainable.

About the AMRUT Programme
- Atal Mission for Rejuvenation and Urban Transformation (AMRUT) is a flagship programme launched in June 2015.
- The primary goals of the AMRUT scheme are to:
  o Provide every household with a tap and a **reliable supply of water**, as well as **sewerage connections**.
  o **Enhance urban living** through the development of **green spaces**, like parks.
  o **Reduce pollution** by promoting the use of **public transport** and facilities for non-motorized transport.

About AMRUT 2.0
- It was launched in 2021 for the duration of 2021-2022 to 2025-2026.
- Its objective is to ensure **universal water supply** via functional tap connections and improve sewerage and septage management in **over 500 cities**.
- Its key features include:
  o **Universal Coverage**: It aims to provide functional tap connections to all households in statutory towns.
  o **Circular Economy of Water**: It encourages **recycling and reuse of treated sewage**, **rejuvenation of water bodies**, and water conservation through the development of **City Water Balance Plans** (CWBP) for each city.
- The Components of the Mission include:
  o **Pey Jal Survekshan**: Assesses equitable water distribution, wastewater reuse, and water body mapping to foster competition among cities.
  o **Technology Sub-Mission**: Integrates global water technologies.
  o **IEC Campaign**: Promotes water conservation awareness.
  o **Ease of Living** improvements include reducing non-revenue water, recycling treated water, and enhancing urban planning and finance systems.

Performance of the AMRUT Programme
- The achievements of AMRUT include 58,66,237 tap connections and 37,49,467 sewerage connections.
- 2,411 parks have been developed and 62,78,571 streetlights were replaced with LED lights under the scheme.

Challenges of the AMRUT Programme
- **Infrastructure Shortfalls**: Many urban households still lack piped water and proper sewerage, with water supply at **69.25 litres per person per day**, below the necessary 135 litres.
- **Water Management**: Issues include overuse and depletion of groundwater, exaggerated by poor sewage treatment and climate variability.
- **Project Execution**: Implementation suffers from lack of comprehensive strategies and limited involvement of local Governments.

Economy

1. Government Bond Buyback

News: The RBI has addressed the tight liquidity in the banking system by introducing a new set of bonds for the Centre's buyback operations.

About Bond Buyback
- It is a financial operation where the Government uses its cash reserves to **prematurely pay back a portion of its outstanding debt through bonds**. It is also known as Government bond buyback.

Purpose and Benefits
- **Debt Management**: Bond buybacks are used to manage the Government's debt more effectively by reducing the burden of scheduled repayments.
- **Interest Cost Reduction**: The Government can lower its interest expenses through bond buybacks.
  o Purchasing its own bonds boosts their demand, raises their prices, and lowers their yields, resulting in cheaper borrowing costs. *(Price of a bond is inversely related to interest rate, hence higher price means lower interest rate).*

Impact on Liquidity
- **Increase in Banking Liquidity**: Banks are significant holders of Government bonds. They **receive cash from the Government** in exchange for the bonds they sell, which increases liquidity in the banking system.
- **Support During Liquidity Shortfalls**: This influx of cash can be vital during periods when banks experience liquidity shortages, helping stabilize the financial system.

2. Preston Curve
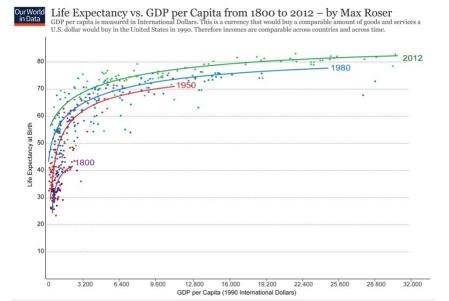
News: Preston curve shows the empirical relationship between the life expectancy and the per capita income of a country. Typically, as the per capita income rises, the life expectancy tends to rise.

About the Preston Curve
- The Preston Curve shows the relationship between **average income per person** in a country (usually measured as GDP per capita) and the **average life expectancy** of its people.
- The concept was introduced by American sociologist Samuel H. Preston in his 1975 paper titled *"The Changing Relation between Mortality and Level of Economic Development"*.

Key Observations of the Preston Curve
- Generally, people in the richer countries live longer compared to those in poorer countries.

Source: Our World in Data, The Preston Curve. The curve tends to rise sharply at low-income levels. As income levels rise, the curve becomes flatter, indicating the gain in life expectancy with rising income gradually decreases.

  o This trend is likely because individuals in richer nations generally have **better access to healthcare**, **education**, **clean environments**, and **nutritious food**.

- When a country's economy grows and incomes rise, life expectancy also tends to increase significantly. This improvement is due to **better access to basic necessities** like food and healthcare.
  - In India, the average income rose from approximately INR 9,000 per year in 1947 to about INR 55,000 in 2011. Correspondingly, the average life expectancy increased from 32 years to over 66 years during the same period.
- The relationship between per capita income and life expectancy **starts to plateau beyond a certain point**. Further increases in income do not lead to significant gains in life expectancy, possibly because **there is a natural limit to human lifespan**.
- Some critics point out that **higher life expectance has been achieved in certain countries even at low per capita income** through **investment in public healthcare**. This is due to improvement in medical technology and life-saving vaccines.
  - Poor countries may get access to these technologies from the richer countries through aid or other initiatives. Thus, there can be **exceptions to the Preston Curve**.

3. Inclusion of Companies in the Bombay Stock Exchange (BSE) SENSEX

News: The Bombay Stock Exchange SENSEX is the most closely watched stock index not only in India but also the world.

About the Bombay Stock Exchange (BSE) SENSEX
- The Bombay Stock Exchange SENSEX was established in 1986. The SENSEX is India's oldest and most closely watched stock index. SENSEX has been derived from SENSitive and indEX.
- **The BSE is among the top 10 stock exchanges in the world in terms of market capitalization**. Hence, BSE SENSEX is closely monitored by foreign investors as well.
- It consists of the **30 largest most liquid**, and **financially sound companies** across **key sectors** of the Indian economy, including Reliance Industries, ICICI Bank, and ITC Ltd.
- The total market capitalization of BSE-listed firms was reported as INR 419.99 lakh crore as of May 24, 2024.

Criteria for Selection in SENSEX
- A stock must have been **listed on the BSE for at least 6 months** and should have been traded on every trading day during this period.
- It should be **among the top 75 companies** based on the average 3-month float or total market capitalization.
- A minimum free-float market cap of 0.50% is required after meeting market cap and liquidity criteria.
- The liquidity is assessed by the cumulative weight of the **3-month Average Daily Value Traded** (ADVT). Stocks whose cumulative ADVT weight exceeds 98% are excluded from consideration for the index.

4. RBI's Regulatory Framework for Project Financing

News: RBI has released draft regulations to enhance the regulatory framework for financing projects with long gestation periods in infrastructure, non-infrastructure, and commercial real estate sectors.

About RBI's Proposed Framework for Project Financing
- The purpose of the framework is to **address high financial risks associated with infrastructure projects**.
  - Such projects often **experience long delays** and **cost overruns** due to various hurdles like regulatory clearances and land acquisition.
  - The RBI aims to tighten the norms for project financing to **address concerns over non-performing assets** (NPAs) due to **defaults in infrastructure projects**.
- The key provisions of the Framework include:

o **Increase in general provisioning for potential losses** during the construction phase from 0.4% to 5%, to be implemented in a phased manner.

o Focus on **preventing defaults** or **extensions in Date of Commencement of Commercial Operations** (DCCO) and managing reductions in the **Net Present Value** (NPV) of projects.

o The framework mandates that all **critical prerequisites**, including environmental, regulatory, and legal clearances, **be met before financial closure**.

> **Provisioning in Banking**
>
> Provisioning is a mechanism to **counter bad assets**. Under provisioning, banks **set aside or provide funds** (generally from their profits) to a **prescribed percentage of their bad assets**. The percentage of bad asset that has to be 'provided for' is called **Provisioning Coverage Ratio (PCR)**. e.g., if the PCR is 40% for a particular category of bad loans, banks have to set aside funds equivalent to 40% of those bad assets out of their profits.
>
> Banks do not provision 100% of the non-performing loan because **they might recover some amount** by selling assets or collateral of the client or through repayments by the client.

o **Continuous monitoring** and **independent certification** of project progress.

o **Mandating a positive NPV** at the outset and **annual re-evaluation** to **prevent stress build-up** and ensure proactive management.

o The original or revised repayment schedule, including any moratorium period, **should not exceed 85% of the project's economic life**.

o Introduction of guidelines for a **standby credit facility** to **address potential overruns due to project delays**.

o The DCCO should be clearly defined, and financial disbursements should align with the stages of project completion.

o Banks are mandated to classify loans as "**non-performing**" if projects exceed a **6-month delay of completion from the original deadline**.

Concerns Associated with the Framework

- Higher provisioning requirement could **impact the short-term profitability of NBFCs and infrastructure financiers**.
- Banks fear that the proposed 5% provisioning rule may **raise interest rates and discourage lending**.
- Developers are concerned about **funding sustainability** due to increased provisioning requirements during both construction and operational phases of projects.
- The blanket 6-month moratorium on all projects is drawing criticism for its extremely stringent stance. This heavy-handed approach may **hamper infrastructure investment growth**.

5. India's Trade Statistics

News: According to the latest data, India's total trade deficit has narrowed to ~US$ 240 billion in 2023-24, down from US$ 264.9 billion in 2022-23.

About India's Trade Statistics in 2023-24

- India registered a **trade deficit with 9 out of its top 10 trading partners** during the fiscal year 2023-24. The nations include China, Russia, Singapore, and South Korea, among others.
- Compared to the FY 2022-23, the **trade deficit widened with China**, **Russia**, **South Korea**, and **Hong Kong**. The **deficit narrowed** with the **UAE**, **Saudi Arabia**, **Indonesia**, and **Iraq**.
- In 2023-24, China surpassed the US to become **India's largest trading partner** with US$ 118.4 billion in bilateral trade.
  o Bilateral trade with the US was slightly lower at US$ 118.28 billion. The US was the top partner in the preceding two years.

- Notable surpluses were recorded with the US, the UK, Belgium, Bangladesh, Italy and France.
- India's major trade agreements include **India-Mercosur PTA** (Preferential Trade Agreement), **India-EFTA TEPA** (Trade and Economic Partnership Agreement), **India-Australia ECTA** (Economic Cooperation and Trade Agreement), **India-UAE CEPA** (Comprehensive Economic Partnership Agreement) and **India Mauritius CEPA**. Mercosur is an economic grouping of Brazil, Argentina, Uruguay and Paraguay.

6. India's Rating Improved by S&P Global Ratings

News: S&P Global Ratings have raised India's economic outlook to 'positive' due to stable politics and good growth. It has kept India's credit rating stable.

Reasons for Improvement

- S&P improved India's outlook **from 'stable'** to '**positive**'. This is the first change in the outlook since 2014. The change was driven by **political stability**, **economic reforms**, and **long-term growth prospects**.
- India's economy grew by over 7% last year and is expected to grow by 8% this fiscal year.
- S&P expects **continued growth momentum**. Increased Government spending on infrastructure is also seen as a **driver for sustained economic development**.

Fiscal Challenges

- **Fiscal Deficit**: The <u>General</u> Government Fiscal Deficit is projected to drop from 7.9% of GDP to 6.8% by 2027-28, but it is still high.
- **Debt Levels**: The debt-to-GDP ratio is expected to stay elevated, not falling below 80% by 2027-28.
- **Government Spending**: Post-pandemic growth has been driven by Government capital expenditure, which may be challenging to maintain alongside fiscal consolidation goals.

Focus Areas for the Government

- **Investment**: The Government should push for private investment to maintain growth momentum.
- **Fiscal Deficit**: The focus should be on reducing the <u>Central</u> Government Fiscal Deficit from 5.1% to closer to the target of 4.5% by FY2025-26.
- **Revenue Collection**: The GST system should be improved by rationalizing rates and slabs to boost revenue.
- **Tax Reforms**: Direct tax reforms should be reassessed and tax administration should be enhanced.
- **RBI Surplus**: The higher-than-expected surplus transfer from the RBI should be used to ease fiscal pressure.
- **Sustainable Growth**: Balance is required between sustaining Government capital expenditure and achieving the goal of fiscal consolidation.

7. UNCTAD Report on Global Debt

News: The Report 'A World of Debt 2024: A Growing Burden to Global Prosperity' released by the UN Trade and Development (UNCTAD) has expressed concern about the global debt crisis.

Key Findings of the Report
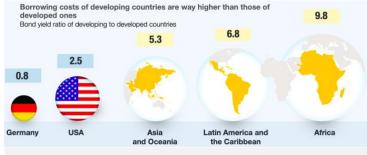
- **Rapid Rise in Global Debt**: Global debt has reached US$ 315 trillion in 2024. This is 3 times the global GDP.
  - Of this, household debt stands accounts for US$ 59.1 trillion (18.8%); business debt at US$ 164.5 trillion (52.2%); and public debt (Governments' borrowing) at US$ 91.4 trillion (29%).
  - The public debt has risen rapidly due to COVID-19 pandemic, rising food and energy prices amidst the wars in Ukraine and Gaza and a slowing economy.
- **Disparities between Developed and Developing Countries**: Developing countries share 30% of the total global debt. But the **debt growth rate** of developing countries is twice that of developed countries.

- o In 2023, developing countries spent **US$ 847 billion in interest payments**. For developing countries, the **interest rate** is also higher, **up to four times that of the US**.
- o African countries are witnessing rapid rise in debt levels. The number of African countries with **Debt-to-GDP ratio** above 60% has increased from 6 to 27 between 2013-2023.
- o 27 African nations spend ~10% of Government funds just for debt interest payment.
- **Impact on Development Spending**: The UN assessment says that ~3.3 billion people currently reside in countries where **debt interest payments overtake spending on either education or health**.

Source: UNCTAD. *The debt of developing countries has risen much rapidly than developed countries.*

- o In Africa, the per capita spending on interest payments is US$ 70; higher than US$ 60 per capita for education and US$ 39 for health.
- **Impact on Climate Action**: Developing countries need to increase climate investments from their current level of 2.1% of GDP to 6.9% by 2030 to meet the Paris Agreement targets. However, they are currently spending more on interest payments (2.9% of GDP) than on climate investments (2.1% of GDP).

Reasons for Rise in Debt in Developing Countries

- Aid has fallen in the last two years.
- **Concessional loans are replacing aid** thus adding to developing countries' debt. In 2012, loans' share in aid for developing countries was 28%, which has reached 34% in 2022.
- The support to lessen debt among developing countries in terms of relief and other actions has also fallen sharply; from US$ 4.1 billion in 2012 to US$ 300 million in 2022.

Source: UNCTAD. *The borrowing costs of African nations are on an average 4 times that of the US and 12 times of Germany.*

8. Global Economic Prospects Report

News: The World Bank has released the Global Economic Prospects Report.

Key Findings of the Report

- **Global Economic Outlook**: The Global GDP is expected to grow at 2.6% for 2024-25, showing signs of stabilization. The growth rate is expected to rise to 2.7% for 2025-26 and 2026-27.
  - o The inflation is expected to be ~3.5%. Central Banks need to be cautious in easing the monetary policies.
- **Challenges to Growth**: Geopolitical tensions, trade wars, high interest rates, climate-related disasters pose challenge to the global economic growth.

- o Geopolitical tensions and armed conflicts can lead to **loss of life**, **disruption of supply chains and trade**. Conflict in the Middle-east can **spike oil prices**, leading to global inflation.
- o Trade barriers, tariff wars can also disrupt global supply chains, leading to rise in prices and inflation. **Persistent inflation erodes purchasing power of consumers**, reducing demand and slowing down the global economy.
- o **Higher interest rates** to curb inflation can **reduce investments**, leading to job losses and further slowing down of the growth rate.
- o Climate Change is resulting in **rising frequency of extreme natural disasters** (cyclones, floods etc.). The disasters cause widespread damage to infrastructure. They disrupt agricultural production, leading to food shortages and price hikes. Rebuilding after disasters puts a **strain on government finances**.
- o The Report highlights measures like **cooperation to facilitate trade**, providing **debt relief** and **food security**, and supporting **green transition** can help reduce the challenges.
- **India's Economic Trajectory**: India's growth rate for 2023-24 has been estimated to be 8.2%. Industrial and services sectors are the main drivers of growth.
    - o The fiscal deficit is expected to decrease due to **higher tax revenues** and **rationalization of expenditure**.

9. World Wealth Report, 2024

News: The Capgemini Research Institute has published the World Wealth Report 2024.

Key Findings of the World Wealth Report 2024

- The report covers 71 countries, representing more than 98% of global gross national income and 99% of the world's stock market capitalization.

Aspect	Description
Definition of HNWIs	• Individuals with **investable assets** of **US$ 1 million or more**, excluding their primary residence, collectibles, consumables, and consumer durables.
Global HNWI Wealth and Population	• **Wealth Expansion**: In 2023, global HNWI wealth grew by 4.7%, reaching US$ 86.8 trillion. • **Population Growth**: The HNWI population increased by 5.1% to 22.8 million globally.
Wealth Bands	• **Ultra-HNWIs**: US$ 30 million or more. • **Mid-Tier Millionaires**: US$ 5-30 million. • **Millionaires Next Door**: US$ 1-5 million.
HNWIs in India	• **Population Increase:** The number of HNWIs in India grew by 12.2% in 2023 compared to 2022, reaching 3.59 million. • **Wealth Growth:** The financial wealth of India's HNWIs increased by 12.4% in 2023, reaching US$ 1,445.7 billion, up from US$ 1,286.7 billion in 2022.
Economic Indicators in India	• **Unemployment Rate**: It decreased to 3.1% in 2023, (7% in 2022). • **Market Capitalization**: It increased by 29.0% in 2023, following a 6% increase in 2022. • **National Savings**: As a percentage of GDP, national savings rose to 33.4% in 2023, compared to 29.9% in 2022.

10. Travel and Tourism Development Index

News: India has improved its ranking in Travel and Tourism Development Index.

About Travel & Tourism Development Index 2024

- The 2024 index is the 2ⁿᵈ edition. It has evolved from the Travel & Tourism Competitiveness Index (TTCI) series produced by the **World Economic Forum** since 2007.
- It is developed in partnership with the University of Surrey and incorporating insights from top Travel & Tourism (T&T) stakeholders, thought leaders, and data partners.
- It evaluates the factors and policies that **facilitate sustainable** and **resilient T&T development**.
- India holds the **39ᵗʰ position**, making it the highest-ranked nation in South Asia and among other lower-middle-income economies. India was ranked 54ᵗʰ in 2021.

Factors Influencing India's Improved Ranking

- **Cultural and Natural Attractions**: India's rich **cultural heritage** and **diverse landscapes** contribute to its appeal as a travel destination.
- **Investments in Tourism**: Increased investments in tourism infrastructure, along with efforts to enhance sustainability and safety in travel and tourism, have positively impacted India's ranking.
- **Competitive Advantages**: India is highly ranked for its **price competitiveness** (18ᵗʰ), **air transport** (26ᵗʰ), and **ground and port infrastructure** (25ᵗʰ).
  - India stands out as one of only three countries ranked in the top 10 across all **resource pillars**, Natural Resources (6ᵗʰ), Cultural Resources (9ᵗʰ) and Non-Leisure Resources (9ᵗʰ).

Challenges and Current Performance

- **Performance Decline Since 2019**: Despite the overall improvement, India's TTDI score in 2024 is 2.1% lower than in 2019, influenced by **global inflation** and **supply issues**.
- **Critical Enabling Gap**: There are key enabling gaps, such as internet connectivity, health and hygiene and environmental sustainability etc.
- **Quality Infrastructure**: In India, public transportation (inter-city buses and trains etc.) isn't as good as airports and air travel. Unlike in the West, where people of all classes use public transport, rich and upper-middle-class Indians usually avoid it. This lowers India's price competitiveness and affects the performance of tourism.

Global Tourism Trends and Outlook

- The **lifting of COVID-19 travel restrictions** and **increased travel demand** are expected to drive a significant **resurgence in international tourist arrivals**.
- The travel and tourism sector's contribution to global GDP is anticipated to return to pre-pandemic levels in 2024, boosting the global industry.

International Relations

1. Antarctic Treaty

News: India hosted the 46ᵗʰ session of the Antarctic Treaty Consultative Meeting (ATCM 46). It is also referred to as the Antarctic Parliament.

About the Antarctic Treaty

- It is an international agreement that governs activities in Antarctica.
  - It was signed on December 1, 1959, and entered into force on June 23, 1961.
- The treaty designates Antarctica as a **scientific preserve**, and a **neutral**, **demilitarized zone** to be **used solely for peaceful purposes**.

- Its key provisions include:
  - **Peaceful Use**: Antarctica is strictly for **peaceful activities**; military activities, including **fortification** and **weapon testing**, are **prohibited**.
  - **Scientific Freedom**: All **activities**, especially **scientific research**, are to be **conducted freely with co-operation** and **data sharing among signatory nations**.
  - **Demilitarization**: **Nuclear explosions** and the **disposal of radioactive waste** are **forbidden**.
  - **Status Quo on Claims:** The Treaty acknowledges existing territorial claims, yet it prohibits establishment of any new claims.
- The treaty covers all territories **south of 60°S Latitude**.
- It **prohibits resource exploitation** in the region.
- It was initially signed by 12 countries. It **now includes 56 countries**. India joined in 1983.
- The **Antarctic Treaty System** (ATS) includes **additional agreements** that manage international relations regarding Antarctica.
- Despite its success, the treaty faces **ongoing challenges** due to **environmental changes** and **human activities**.

India in Antarctica

- Since 1983, India has been a consultative party to the Antarctic Treaty, participating in decision-making processes about the governance of the Antarctic.
- **Research Stations**
  - **Dakshin Gangotri**: It was India's first research station, established in 1983 and was operational till 1990.
  - **Maitri:** It was established in 1989 in **Schirmacher Oasis**. It is still active, and supports summer and winter crews.
  - **Bharati**: It was opened in 2012 and is located on the Prydz Bay coast. It focuses on oceanographic and geological studies.

Indian Research stations at Antarctica

  - India intends to **establish Maitri II** by 2029 to replace the ageing Maitri station.
- In 2022, India enacted the **Antarctic Act to reaffirm its commitment to the treaty's principles**.

2. Small Island Developing States (SIDS)

News: The 4th International Conference on Small Island Developing States (SIDS-4) was held recently.

About SIDS

- SIDS are a **grouping of developing countries** which are **small island countries** and **share similar sustainable development challenges**.
  - These challenges include **small but growing populations**, **limited resources**, **remoteness**, **susceptibility to natural disasters**, **vulnerability to external shocks**, excessive dependence on international trade, fragile environments and **heightened susceptibility to climate change**.
  - Their growth and development are held back by **high communication**, **energy** and **transportation costs**; lack of infrastructure due to their small size; and **little to no opportunity to create economies of scale**.
- The SIDS were first recognized as a distinct group of developing countries at the **United Nations Conference on Environment and Development** in June 1992.

- The **Barbados Programme of Action** was produced in 1994 to assist them in their **sustainable development efforts**.
- The **United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States** (UN-OHRLLS) represents the group of States.
- As of 2023, the UN-OHRLLS lists **57 SIDS nations** (**39 sovereign States** and **18 dependent territories**).
- These nations are grouped into **3 geographical regions**: **(a)** the Caribbean; **(b)** the Pacific; **(c)** Africa, Indian Ocean, Mediterranean and South China Sea (AIMS).

3. Arab League

News: The Summit of the Arab League was held recently in Manama, Bahrain.

About the Arab League

- It is formally known as the **League of Arab States** (LAS).
- It is a regional organization of the Arab States in the **Middle East** and **parts of Africa**.
- It was established in Cairo in March 1945. It was established in response to concerns about **postwar colonial divisions** and strong opposition to the establishment of a Jewish state on Palestinian territory.
- It is **headquartered in Cairo**, Egypt and its **official language is Arabic**.
- It has total 22 members.
  - **Founding members** were Egypt, Syria, Lebanon, Iraq, (Trans)Jordan, Saudi Arabia, Yemen (*joined May 1945*).
  - The other members include Libya, Sudan, Tunisia, Morocco, Kuwait, Algeria, Bahrain, Oman, Qatar, the UAE, Mauritania, Somalia, Palestine, Djibouti, and Comoros.
  - The League has conferred **Observer Status** to Armenia, Brazil, Chad, Eritrea, Greece, **India**, and Venezuela.
- Its primary aim is to **promote Arab interests**. Its main objectives include:
  - Strengthen and coordinate the political, cultural, economic, and social programs of the member States.
  - Resolve disputes among member States or between them and third parties.
  - Provide military support to defend member states, based on the **Joint Defence and Economic Co-operation Treaty**, **1950**.
- The highest body of the League is the **Council**, consisting of representatives from member States, usually foreign ministers, their representatives, or permanent delegates.
  - Decisions are made **on a majority basis**. Each member has one vote. Decisions are binding only on those States that voted for them, with **no enforcement mechanism for compliance**.

About Manama Declaration

The Manama Declaration emerged from the 33rd Arab League Summit. The Declaration called for:

- The deployment **of United Nations Peacekeeping Forces** in the occupied Palestinian territories.
- The protection to continue until a **Two-State solution** is implemented.
- The Declaration urged all Palestinian factions to unite under the umbrella of the Palestine Liberation Organization (PLO).

4. Colombo Process

News: India has become the Chair (2024-26) of the Colombo Process for the first time since its inception in 2003.

About the Colombo Process

- It is a Regional Consultative Process that aims to promote **sharing of best practices** related to **overseas employment** for countries in South and Southeast Asia that send migrant workers abroad.
- The Colombo Process includes **12 Asian member States**: Afghanistan, Bangladesh, Cambodia, China, India, Indonesia, Nepal, Pakistan, the Philippines, Sri Lanka, Thailand, and Vietnam. India has been a member since its establishment.
- Its objectives include:
  o **Exchange of Information**: Members share experiences, lessons learned, and best practices for managing labour migration.
  o **Consultation**: The process involves consultations on **challenges faced by migrants**, with the aim of improving the well-being of overseas workers.
  o **Optimization of Benefits**: The goal is to **maximize the developmental benefits** from organized overseas employment and to enhance dialogues with destination countries.
  o **Review and Monitoring**: Undertake review and monitoring of the implementation of recommendations and identification of further action steps.
- Decisions within the Colombo Process are **made by consensus** and **are non-binding**.
- The process is coordinated through the Permanent Missions of the member states at the United Nations in Geneva.
- **International Organization for Migration (IOM)** has been **offering technical support to the Colombo Process** since it began and functions as its Secretariat.
- The process includes 5 Thematic Area Working Groups (TAWGs):
  o Skills and Qualification Recognition, led by Sri Lanka.
  o Fostering Ethical Recruitment, led by Bangladesh.
  o Pre-Departure Orientation and Empowerment, led by the Philippines.
  o Remittances, led by Pakistan.
  o Labour Market Analysis, led by Thailand.

5. UN Military Gender Advocate of the Year Award

News: Major Radhika Sen has been awarded UN Military Gender Advocate of the Year Award for 2023.

About the United Nations Military Gender Advocate of the Year Award

- The Award recognises the **dedication and effort of an individual peacekeeper** in promoting the principles within the UN Security Council Resolution 1325.
- It was established in 2016 by the **Office of Military Affairs** within the **Department for Peace Operations**.
- The Award recognizes a military peacekeeper who has **best integrated a gender perspective into peace-keeping activities**.
- Each year, the awardee is selected among candidates nominated by Force Commanders and Heads of Mission from all peace operations.

About Major Radhika Sen

- **Major Radhika Sen** has received the UN Military Gender Advocate of the Year Award for 2023. The UN Secretary General António Guterres presented the award.

- Major Radhika Sen is an **Indian peacekeeper in Congo**. She commanded an engagement platoon in eastern **Democratic Republic of the Congo** from March 2023 to April 2024. It is part of an Indian rapid deployment battalion. Her platoon included 20 women and 10 men.
- This award was bestowed upon her for her **exceptional service and involvement in gender-focused initiatives** within the **UN Peacekeeping Mission MONUSCO**.
- Major Radhika Sen is the second Indian peacekeeper to receive this prestigious honour, following **Major Suman Gawani**, who was a co-recipient in 2019.

About MONUSCO

- MONUSCO was established by the **UN Security Council**. In 2010, it took over, from an earlier UN peace-keeping operation that is the **UN Organization Mission in Democratic Republic of the Congo** (MONUC).
- It's one of the largest UN peacekeeping efforts employing approximately 16,300 individuals.
- Its primary role is to **protect civilians from violence**, particularly in conflict-prone areas like North Kivu.
- MONUSCO is notable for **its use of UAVs for monitoring purposes** which is a first in UN peacekeeping history.
- It features an Intervention Brigade which was authorized in 2013 to conduct targeted offensive operations against armed groups.

6. Canadian Parliamentary Report Calls India 2nd-biggest Foreign Threat

News: A Report by the National Security and Intelligence Committee of the Parliament of Canada has named India as the 2nd-biggest foreign threat to the country's democracy.

About the Findings of the Report

- The report states that **India's alleged interference in Canadian democratic processes** and institutions has been increasing.
- This interference includes targeting Canadian politicians, ethnic media, and Indo-Canadian ethnocultural communities. The Report says that Indian operations have **expanded beyond countering pro-Khalistani efforts in Canada**.
- The report has **worsened the already strained relationship between India and Canada**. Tensions escalated following the June 2023 killing of Hardeep Singh Nijjar, a pro-Khalistan ideologue, in the British Columbia Province of Canada.
- The report has identified **China as the top foreign threat to Canada's democracy**, ahead of India. *(Read More about India-Canada Relationship)*.

7. Biopharmaceutical Alliance and Vaccine Diplomacy

News: India, Japan, South Korea, the EU and the US have launched the Biopharmaceutical Alliance to address the shortages in drug supplies and enhance the resilience of drug supply chains.

About Biopharmaceutical Alliance

- It is a **strategic partnership alliance** that aims to secure supply of biopharmaceutical products worldwide and aid in **vaccine diplomacy**.
- It aims to **coordinate policies**, **regulations**, and **research and development** support measures among the participating countries.
- By collaborating, the member countries hope to build a system that can withstand future global health crises.
- It has been formed in response to the **drug supply shortages** experienced during the COVID-19 pandemic.
  - The pandemic had highlighted the need for a reliable and sustainable supply chain for biopharmaceuticals.

Working Mechanism

- **Implementation**: The member countries will start implementing the agreed coordination of policies and research support.
- **Supply Chain Mapping**: Developing a comprehensive map of the pharmaceutical supply chain to identify and mitigate vulnerabilities.
- **Ongoing Collaboration**: Continued collaboration and dialogue among the participating countries to ensure the alliance's goals are met.

Vaccine Diplomacy to Mitigate Shortages of Drug Supply

- Vaccine diplomacy **fosters collaboration** between countries. Partner countries share raw materials and resources to smoothen production across the supply chain.
- Sharing of information, improved communication helps in **anticipating potential drug shortages** in advance.
- Vaccine diplomacy helps in **expanding vaccine production capacity** by sharing of technology or production licences to other countries, encouraging the **creation of new manufacturing hubs** and freeing up existing facilities for other medications.
- Existing vaccine production facilities can be **repurposed to manufacture essential drugs**, **diversifying supply chains**.
- It **reduces dependency on single-source suppliers**, mitigating risks of supply disruptions during crises.

8. SIPRI Report on Nuclear Warheads

News: The Stockholm International Peace Research Institute (SIPRI) has released a report on Nuclear Warheads.

Key Highlights of the Report

- The global inventory of nuclear warheads includes **12,121 nuclear warheads**.
- 9,585 are held in **military stockpiles**. 3,904 of these **warheads are deployed** with missiles and aircraft.
- ~2,100 of deployed warheads are on **high operational alert**, primarily held by Russia and the USA.
  - o **China** is believed to have **joined this category** for the first time.

World nuclear forces, January 2024

Country	Deployed warheads[a] 2024	Stored warheads[b] 2024	Military[c] stockpile 2023	Military[c] stockpile 2024	Retired[d] warheads 2023	Retired[d] warheads 2024	Total inventory[e] 2023	Total inventory[e] 2024
United States	1 770	1 938	3 708	3 708	1 536	1 336	5 244	5 044
Russia	1 710	2 670	4 489[f]	4 380	1 400	1 200	5 889[f]	5 580
United Kingdom	120	105	225	225[g]	–	–	225	225[g]
France	280	10	290	290	–	–	290	290
China	24[h]	476	410	500	–	–	410	500
India	–	172	164	172	–	–	164	172
Pakistan	–	170	170	170	–	–	170	170
North Korea	–	50	30	50[i]	–	–	30	50[i]
Israel	–	90	90	90	–	–	90	90
Total	3 904	5 681	9 576[f]	9 585	2 936	2 536	12 512[f]	12 121

- **China is expanding its nuclear arsenal faster than any other country**. China now possesses **500 nuclear warheads**, almost triple the number of weapons held by India and Pakistan (individually).
- India's nuclear arsenal has reached **172 warheads in 2024**. Pakistan has 170.
- According to SIPRI, nuclear arms control and disarmament diplomacy suffered more major setbacks in 2023.
  - o In February 2023, Russia suspended its participation in the 2010 **New START treaty**.
  - o In November 2023, Russia withdrew its ratification of the **Comprehensive Nuclear-Test-Ban Treaty** (CTBT), citing an imbalance with the US, which has not ratified it. Russia still remains a signatory though.

Science and Technology

1. AI Agents

News: AI Agents surpass traditional voice assistants and chatbots in terms of capabilities indicating rapid development of AI Technology. GPT-4o and Project Astra fall in the domain of AI Agents.

About AI Agents

- AI agents are advanced AI systems that **interact in real-time** with humans **using multiple modes of communication** such as **text**, **voice**, and **images**.
- Unlike traditional language models operating solely on text, AI agents can **process voice and visual inputs**.
- They perceive their environment via **sensors**, process this information with **AI algorithms**, and **take actions based on these data**. This allows them to **adapt to new situations** and **handle a variety of scenarios**.

Comparison with Large Language Models (LLMs)

- **Enhanced Interaction**: AI Agents provide **more natural and immersive interactions** by integrating voice, vision, and environmental sensing, unlike LLMs which are restricted to generating text.
- **Contextual Awareness**: They understand and respond based on the context of interactions, which makes them capable of **offering personalized and relevant responses**. They have autonomy to perform complex tasks such as coding and data analysis.

Potential Uses of AI Agents

- **Versatile Assistants**: They can manage tasks ranging from giving personalized recommendations to scheduling appointments, ideally suited for customer service.
- **Educational Tools**: They can act as personal tutors, adapting to different learning styles and offering customized instructions.
- **Healthcare**: They can assist medical staff through diagnostic support and real-time monitoring of patients.

Risks and Challenges

- **Privacy and Security**: They can access and use a lot of personal and environmental data. There is a significant concern about security and potential misuse of the personal information.
- **Bias**: They might also replicate biases present in the data or algorithms they were trained on. This can result in unfair or harmful decisions.
- **Regulation Needs**: As AI agents become more widespread, there needs to be strong rules and guidelines to ensure they are used responsibly and safely.

2. GNSS-based Electronic Toll Collection (ETC) System

News: The Indian Highways Management Company Limited (IHMCL), promoted by the NHAI, is working to develop a GNSS-based Electronic Toll Collection (ETC) system on India's National Highways.

About the GNSS-based Electronic Toll Collection (ETC) System

- The GNSS-based ETC system utilizes the technology of **Global Navigation Satellite System** (GNSS) to facilitate electronic toll collection **without physical toll barriers**.
- By using satellites, the **system accurately tracks vehicle movements** and **calculates tolls** based on the distance travelled on tolled highways.
- Vehicles must be equipped with GNSS-enabled On Board Units (OBUs) to be part of this system.
- The NHAI plans to integrate this system within the existing **FASTag ecosystem**, starting with a hybrid model that supports both **RFID-based** and **GNSS-based ETC simultaneously**.
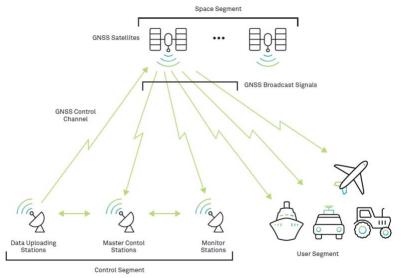
Benefits of the GNSS-based ETC System
- The system is designed to ensure smooth vehicle movement along the National Highways by **eliminating physical toll booths**.
- It offers a **barrier-free tolling experience**, significantly **reducing congestion** and **wait times**.
- It has **distance-based tolling**, where users will be **charged solely for the segments of the highway they use**.
- It aims to enhance toll collection efficiency by **minimizing revenue leakages** and **preventing toll evasion**.

About GNSS
- It is a **constellation of satellites orbiting Earth**, and continuously transmitting radio signals with **precise time and orbital information**.
- A GNSS consists of constellation of satellites, control stations and receivers.
  - **Satellites**: Orbit the Earth, transmit time-stamped signals.
  - **Ground Control Stations**: Monitor and manage satellite constellation.
  - **Receivers**: Devices that capture satellite signals to determine precise location.
- GNSS include **Global Positioning System** (GPS, US), **Galileo** (EU), **GLONASS** (Russia), **BeiDou** (China). India has regional navigation satellite system (**IRNSS**) and Japan has **Quasi-Zenith Satellite System** (QZSS).

Applications of GNSS
- **Navigation**: Used in aviation, maritime, and road transport.
- **Mapping and Surveying**: Provides precise geospatial data for mapping and land surveys.
- **Agriculture**: Enables precision farming techniques.
- **Disaster Management**: Assists in emergency response and disaster relief operations.
- **Telecommunications**: Synchronizes networks and systems.

3. Copernicus Emergency Management Service (EMS) Programme

News: Copernicus Emergency Management Service (EMS) was deployed by the EU to help locate the debris of the Helicopter carrying Iranian President that had crashed in North-western Iran.

About Copernicus Emergency Management Service (EMS) Programme
- It was originally launched as the **Global Monitoring for Environment and Security Programme** in 1998.
- The program employs a comprehensive suite of data sources, including **satellites**, and **terrestrial**, **airborne**, and **maritime measurement systems**, to offer **environmental information** useful to researchers, policy-makers, public authorities, international organizations, and commercial and private users.
- It supports a range of applications, like **climate change response**, **disaster management**, and **agriculture**.
- The space component of the program comprises a **constellation of satellites** known as the **Sentinels** and the **Contributing Missions**.

- This is supplemented by a ground component, which consists **of in-situ sensors** that facilitate access to data from the Sentinels and Contributing Missions.

Components of the Service

It has two components: **Mapping Component and Early Warning Component**.
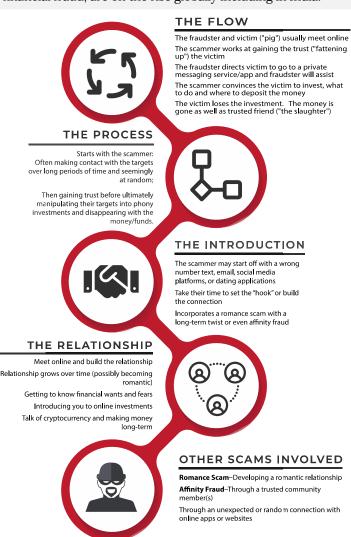
- **Mapping component** provides maps and analysis based on satellite imagery.
  - o **Rapid Mapping (RM)**: It offers timely maps and analyses within hours or days for **immediate response needs**.
    - It involves the acquisition, processing, and analysis of satellite imagery, geospatial data, and pertinent social media content in a rapid manner.
  - o **Risk and Recovery Mapping (RRM)**: It produces detailed maps for **long-term disaster management**, focusing on prevention, preparedness, disaster risk reduction, and recovery, usually within weeks or months.
- **Early Warning Component**: It issues alerts and provides **near-real-time assessments of environmental threats** such as floods, droughts, and forest fires.

4. Pig Butchering Scam

News: Pig Butchering Scams, a type of online financial fraud, are on the rise globally including in India.

About Pig Butchering Scam

- It is also known as a "**sha zhu pan**" scam. It is a type of online investment fraud.
- The term "pig butchering" comes from the scammers' practice of "fattening up" their victims by building trust over time before "slaughtering" them and stealing their money.
- The scammers, or "hosts," **initiate contact through social media**, dating apps, or mis-leading messages. The host **establishes a fake relationship** or friendship with the **target**, referred to as the "**pig**".
- The scammer introduces the concept of **cryptocurrency trading** to raise interest. Victims are directed to **fraudulent trading app**, where they are **misled to believe they are making profitable trades**.
- As trust builds, the scammer persuades the victim to **increase their investment**, effectively "fattening" them for the scam.
- When victims attempt to withdraw funds, they face excuses or high fees from the fake platform, revealing the scam's true nature.

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- Due to the irreversible nature of blockchain transactions, recovering lost funds is often extremely challenging.

5. Recombinant Proteins

News: Researchers at the Indian Institute of Science have devised an innovative method for producing recombinant proteins.

About Recombinant Proteins
- They are **proteins produced artificially** by introducing specific genes (Recombinant DNA) into host organisms, such as bacteria or yeast.
  - These genes **instruct the host organisms to manufacture the desired protein**.
- There are various types of Recombinant Proteins based on their applications and production methods like the **interferons**, **recombinant hormones**, **interleukins** etc.
- Examples of recombinant proteins include **human insulin for diabetes**, human growth factors for growth hormone deficiency, Factor VIII for haemophilia, and therapeutic monoclonal antibodies for treating cancer and viral infections like SARS-CoV-2.

Process of Production of Recombinant Proteins
The production of Recombinant Proteins involves **inserting a modified gene into a suitable vector** (like a plasmid) and then transferring it into host cells (like bacteria or yeast). The steps involved are:
- **Insert Gene**: A gene is modified and inserted into a vector.
- **Transfer to Cells**: The vector is introduced into host cells.
- **Cell Growth**: These cells are grown in a culture until they reach high concentration.
- **Harvesting**: After growing, the cells are harvested to obtain the recombinant protein.
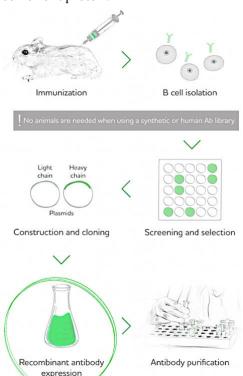
Applications of Recombinant Proteins
- **Biomedical Research**: They are used to understand health and disease mechanisms.
- **Biotherapeutics**: They are employed in the development of biotherapeutic products (for treatment of diseases).
- **Protein-Based Polymers**: They are also utilized in drug delivery systems.
- **Treatment of Diseases**: They are used to produce antibodies and enzymes.
- **Tissue Engineering**: They provide protein scaffolds for tissue engineering applications.

About Proteins
- Proteins are large, complex molecules that are key building blocks of life. They are **polymer chains** made of **amino acids**.
- They have several important functions like **catalysing metabolic reactions**, **DNA replication**, **responding to stimuli**, **providing structure to cells and organisms**, and **transporting molecules** from one location to another.

Immunization

B cell isolation

No animals are needed when using a synthetic or human Ab library

Light chain   Heavy chain

Plasmids

Construction and cloning

Screening and selection

Recombinant antibody expression

Antibody purification

- Proteins differ from one another primarily in their **sequence of amino acids**, which is dictated by the **nucleotide sequence of their genes**, and which usually results in **protein folding** into a specific 3D structure that determines its activity.

6. Psychedelic Drugs (Psychedelics)

News: Researchers have advocated for domestic clinical trials of psychedelic drugs in India, due to low effectiveness of existing medications in treating mental health issues.

About Psychedelics

- Psychedelics drugs **alter perception**, **behavior**, **consciousness**, and often intensify sensory awareness.
- They are a **subset of psychotropic substances** known for their ability to drastically change an individual's thoughts and perceptions, and can **cause vivid hallucinations**.
- **Categories of Psychedelics**
  - **Classical Psychedelics**: These compounds primarily cause hallucinations by activating the **serotonin 5-HT** receptor, which is prevalent throughout the human body, including in the gastrointestinal tract, platelets, and the nervous system. Examples include **LSD** (lysergic acid diethylamide), psilocybin, and **DMT** (N, N-Dimethyltryptamine).
  - **Non-Classical Psychedelics**: These substances interact with a variety of receptors. Notable examples are **ketamine** and **MDMA** (3,4-methylenedioxy-N-methamphetamine).
- Most psychedelics **enhance the presence of serotonin**, a **hormone that stabilizes mood**, by binding to serotonin receptors. These receptors are molecules located on cell surfaces that trigger specific biochemical reactions when they bind with certain chemicals.
- At present, 5 psychedelics are being extensively **studied in clinical research** focused on **treating mental health issues**: psilocybin, LSD, MDMA, ketamine, and DMT.
- The **UN Convention on Psychotropic Substances (1971)** regulates ~200 psychotropic substances divided into 4 schedules, with Schedule I listing those with the highest potential for abuse. The Convention does not specify the count, or the types of substances classified as psychedelics.

7. Virus-Like Particles (VLPs)

News: Scientists at the Institute of Advanced Virology (IAV) in Thonnakkal (Kerala) have created a new method to produce non-infectious Nipah virus-like particles (VLPs) in the lab.

About Virus-Like Particles (VLPs)

- VLPs are molecules that **resemble viruses but are non-infectious**. They are useful for **studying viral behavior without the risk of causing disease**.
- When introduced into the body, **VLPs trigger an immune response without causing disease symptoms**, effectively training the body to recognize and fight the actual virus.
- They are highly effective in **creating vaccines for diseases** such as human papillomavirus (HPV), hepatitis B, and malaria.
- VLPs allow scientists to test vaccines and treatments for viruses like Nipah in safer labs with **lower safety requirements** (BSL-2). This **makes the research process safer** and more accessible.
- VLPs have also been **used as nanomachines to deliver drugs to specific sites** and cells within the body.

Structure and Function

- **Size**: VLPs are small, with a radius of about **20 to 200 nm**, allowing them to enter lymph nodes and activate the immune system. (nm = nanometer = 10^{-9}m)

- **Composition**: VLPs are composed of one or more **structural proteins**, possibly arranged in multiple layers. They may include an **outer lipid envelope** that mimics the virus's protective outer layer.
- VLP vaccines can be produced using bacterial, yeast, insect, or mammalian cells and are known for their strong immune response due to the dense display of epitopes (*part of the antigen to which antibody binds*).

About Nipah Virus

- Nipah virus (NiV) is a **zoonotic virus**, transmitting from animals to humans, through **contaminated food**, or **directly between people**.
- It can cause **multiple illnesses in humans**, like asymptomatic infections, **acute respiratory problems** and **fatal encephalitis**. It also causes severe disease in animals like pigs, affecting economic stability for farmers.
- At present, there are **no specific drugs or vaccines for Nipah virus**.
- Intensive supportive care is crucial to manage severe respiratory and neurological complications.

8. Rabies as Notifiable Disease

News: The Government of Jammu and Kashmir has classified human rabies as a notifiable disease under the Epidemic Diseases Act of 1897.

About Notifiable Diseases

- A notifiable disease is one that **law mandates must be reported to Government authorities**.
- This reporting helps in **monitoring the disease** and **providing early warnings** of **potential outbreaks**.
- The **World Health Organization's International Health Regulations**, **1969** require disease reporting to the WHO in order to help with its global surveillance and advisory role.

Notification Process

- **Written Notification**: For most diseases, healthcare providers must fill out a specific form detailing the case and submit it to local or state health authorities within 3 days.
- **Verbal Notification**: In urgent situations, healthcare providers are required to report cases verbally via phone within 24 hours.
- **Electronic Reporting Systems**: Some regions may use electronic health records and reporting systems to streamline the notification process

Stakeholders

- All healthcare stakeholders (Doctors, Nurses, other healthcare professionals, Laboratories, Clinics and Hospitals) are required to notify the health authorities regarding the cases reported.

About Rabies

- Rabies is a **zoonotic**, **viral disease preventable by vaccine**, caused by the RABV virus.
- It primarily **targets the central nervous system**, causing **severe brain disease** and, ultimately, death if treatment is not administered before symptoms appear.
- **Main Carriers**: Domestic dogs are the **primary transmitters** of the rabies virus to humans in up to 99% of cases. It can affect both domestic and wild animals.
- **Mode of Spread**: The virus spreads to humans and animals through **saliva**, typically via **bites**, **scratches**, or direct contact with mucous membranes (e.g., eyes, mouth, or open wounds).

Symptoms

- **Early Signs**: Initial symptoms include lethargy, fever, vomiting, and anorexia.
- **Advanced Symptoms**: Rapid progression to **cerebral dysfunction**, ataxia, paralysis, difficulties in breathing and swallowing, excessive salivation, unusual behavior, aggressiveness, and self-mutilation.

- Once clinical symptoms manifest, **rabies is almost always fatal**.

Prevention

- The most cost-effective method to prevent rabies in humans is by **vaccinating dogs**, including puppies, to cut off the transmission at its source.

Treatment

- **Post-Exposure Prophylaxis (PEP)**: Treatment after exposure to rabies includes wound care, administration of **human rabies immune globulin** (HRIG), and a series of **4 or 5 rabies vaccines**.
- This treatment is nearly **100% effective in preventing the disease** if given promptly after exposure.
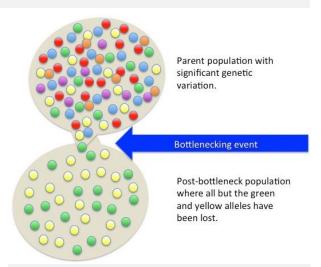
9. Genetic Drift

News: Scientists have discovered a new species within the genetic family of an endangered pupfish native to south-central New Mexico. The emergence of two species is notable because it was primarily driven by genetic drift.
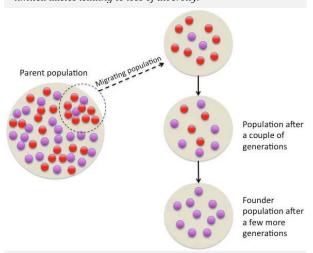
About Genetic Drift

- It is fundamental evolutionary mechanism. It occurs when there are **random fluctuations** in the **frequencies of alleles** (different forms of a gene) **within a population over time**. (*Allele is a variant of the sequence of nucleotides at a particular location, on a DNA molecule. Nucleotides are organic molecules that form the DNA and RNA*).
- The process of Genetic Drift is driven by random sampling of alleles and **random events affecting individual survival and reproduction**.
- **Smaller populations are particularly vulnerable** to genetic drift because their smaller gene pools are less able to withstand random changes.
- Genetic drift can result in an allele becoming either fixed (the only allele present at a locus) or lost within the population, **reducing genetic diversity**.
- **Population bottleneck** refers to significant **reductions in population size** due to events like natural disasters which can intensify genetic drift. This can lead to the **loss of rare alleles** and a reduction in the overall genetic diversity.
- Genetic drift can cause a **new population to become genetically distinct from its original population**. This divergence can contribute to the **evolution of new species** (Founder Effect).

Comparison with Natural Selection

- Unlike natural selection, which involves traits that improve survival and reproductive success, **genetic drift is the result of chance**.

Parent population with significant genetic variation.

Bottlenecking event

Post-bottleneck population where all but the green and yellow alleles have been lost.

Source: Wikimedia Commons. Bottleneck Event leads to large reduction in population. The surviving population may have limited alleles leading to loss of diversity.

Parent population

Migrating population

Population after a couple of generations

Founder population after a few more generations

Founder Effect, a small section of population migrates and may contain different allele frequencies than original population. With time, some alleles (red) disappear altogether.

- Natural selection operates when **individuals with advantageous traits reproduce more successfully**, **gradually changing the gene pool** and characteristics of the population.
- Genetic drift **lacks selection pressure**; it does not favour specific traits, thus affecting populations randomly **without regard to the fitness of the organisms**.

Environment

1. UNESCO State of Ocean Report 2024

News: The Intergovernmental Oceanographic Commission of UNESCO has released the State of the Ocean Report 2024.

About the State of Ocean Report 2024
- The UNESCO 'State of the Ocean Report' was started by the **Intergovernmental Oceanographic Commission** (IOC-UNESCO) during the 2022 United Nations Ocean Conference.
- The report provides an overview of the current conditions of oceans. It helps track the progress of the **UN Decade of Ocean Science for Sustainable Development** (2021–2030) and encourages efforts towards creating a **sustainable future for our oceans**.
- The report is released every year on **World Oceans Day** (June 8) and aligns with **the 7 goals of the UN Ocean Decade**.

Key Highlights of the Report
- **Ocean Warming**: The upper 2,000 meters of the oceans have been **warming significantly**.
  - The rate of warming has increased from 0.32 ± 0.03 watts per square meter (W/m^2) to 0.66 ± 0.10 W/m^2 in the past 20 years.
- **Energy Absorption**: Oceans are absorbing about **90% of the Earth's excess energy**. This causes **de-oxygenation** (loss of oxygen), which **threatens marine ecosystems** and human economies that rely on them.
- **Ocean Acidification**: The acidity of the ocean is increasing globally, especially in the open ocean, with a **notable drop in pH** (pH decline of 0.017-0.027 pH units per decade) since the late 1980s.
- **Sea Level Rise**: Sea levels have been rising steadily since 1993 (3.4 mm/year). Better monitoring systems are needed to track this at all levels.
- **Marine Carbon Dioxide Removal**: There is growing interest in technologies to remove carbon dioxide from the ocean, but their effectiveness and environmental impact are still uncertain.
  - Examples of such technologies include **altering the chemical composition of seawater** to make oceans absorb more CO_2 from the atmosphere or **adding nutrients like iron** to encourage the growth of **microscopic plankton** that can sink to the seafloor and be stored for centuries or longer.

Impact of Ocean Warming
- The warming of oceans can lead to **marine heatwaves**, **increased frequency of cyclones**, **disruption of ocean circulation**, **destruction of marine ecosystems** due to warmer waters and disrupted circulation etc.
- These developments will have **detrimental impact on coastal communities** who are heavily dependent on fisheries and other marine resources for their survival.

2. Breaching the 1.5°C Threshold

News: Europe's Copernicus Climate Change Service (C3S) has reported that May 2024 has been the warmest on record. The WMO reported that there is an 80% chance that the world will temporarily cross the 1.5° Celsius threshold in the next 5 years.

About Current Climate Situation

- May 2024 was the warmest May on record, with each of the past 12 months setting new warming records.
- The **average global temperature in May 2024 was 1.5°C above the 1850-1900 pre-industrial reference period**. From June 2023 to May 2024, the average temperature was 1.63°C above this baseline.
- The World Meteorological Organization (WMO) has predicted an 80% chance that at least one calendar year between 2024 and 2028 will see average temperatures exceed 1.5°C above pre-industrial levels.

About the 1.5°Celsius Threshold

- **Paris Agreement (2015)** aims to limit global temperatures to "**well below**" **2°C above pre-industrial levels**, with an aspirational goal of **capping warming at 1.5°C**.
- Climate scientists generally use the **1850-1900 period as the baseline for measuring temperature increases**.
- Breaching this threshold could lead to **high risks** for some regions and **vulnerable ecosystems** over extended periods.
- The 1.5°C limit is set to **avoid the disastrous and irreversible impacts of climate change**, which become **more pronounced at warming above 2°C**.

Consequences of Breaching the Threshold

- Breaching 1.5°C will not instantly trigger a climate disaster but will **significantly increase the risk and intensity of adverse effects** such as **sea level rise**, **intense floods**, **droughts**, and **wildfires**.
- The world is already experiencing **severe heatwaves**, **coral bleaching**, and other **climate-related events** exacerbated by rising temperatures.
  - North and Central India experienced a heatwave in May-June 2024 with temperatures nearing 50°C, which has been attributed to global warming.
- **High Ocean temperatures** have triggered the **fourth global mass coral bleaching event**, affecting marine life and human communities dependent on reefs.
- **5 major climate tipping points** are at risk of being crossed due to warming, leading to irreversible changes. These tipping points fall into **3 broad categories**: **Cryosphere** (for example, melting of the Greenland ice sheet), **Ocean-atmosphere** (change in water temperature), and **Biosphere** (death of coral reefs).

3. Global Nitrous Oxide (N_2O) Budget

News: A global assessment of N_2O emissions has been published in the journal Earth System Science Data.

Key Findings of the Study

- The Study examined global data for all major economic activities contributing to emissions of N_2O from anthropogenic and natural resources.
- Emissions from human activities have **increased by 40%** (3 million metric tons of N_2O per year) between 1980 and 2020.
- China (16.7%), India (10.9%), US (5.7%), Brazil (5.3%) and Russia (4.6%) were top 5 emitters.
- The concentration of atmospheric **N_2O has reached 336 parts per billion in 2022** (25% rise over pre-industrial levels).

About N_2O

It is a colourless, odourless and non-flammable gas.

It is a **depressant** and leads to a **state of euphoria**. Some persons can experience mild hallucinations. It is called **laughing gas**.

It is used in medical and dental procedures as a **sedative.** It is also used as **oxidizer in rockets**, to enhance **performance of internal combustion engines** and as **aerosol propellent** in cooking sprays.

- **Emissions from agriculture continue to grow,** while those from other sectors, such as fossil fuels and the chemical industry, are not growing or declining globally.
- Europe had the largest rate of decrease between 1980 and 2020, resulting from reduced fossil fuel and industry emissions.
- China and South Asia had the largest rise in the N_2O emissions from 1980 to 2020 at **92%.**

Sources of N_2O

Natural: Oceans, inland water bodies, soils contributed 11.8% emissions between 2010-2019.

Anthropogenic: **Agriculture** (74% of human driven emissions due to chemical fertilizers, use of animal waste, dairy and meat production), **industry**, **combustion**, **waste treatment**.

Sinks of N_2O

Soils: Denitrifying bacteria convert N_2O to Nitrogen (N_2) gas under anaerobic conditions removing N_2O from the atmosphere.

Oceans: Marine phytoplankton and other organisms absorb N_2O from the atmosphere.

Stratosphere: N_2O reacts with Ozone (O_3) to form nitrogen oxides (NO_X) and Nitrogen gas (N_2).

Impact of N_2O Emissions

- The Global Warming Potential of N_2O is 273 times that of CO_2 over a 100 year period. Rise in N_2O increases pace of global warming.
- N_2O breaks down in the stratosphere to **release nitrogen oxides that damage the ozone layer**. Ozone layer is necessary to protect the Earth from the harmful ultra-violet rays.

4. Degradation of Rangelands

News: A Report by United Nations Convention to Combat Desertification (UNCCD) has expressed concern over the degradation of Rangelands.

About Rangelands

- The UNCCD Report, **Global Land Outlook: Thematic Report on Rangelands and Pastoralists**, has observed that up to 50% of the world's rangelands are degraded, nearly double the previous estimates of 20-35%.
- Rangelands primarily consist of **natural grasslands utilized by livestock** and **wild animals** for **grazing** and **foraging**.
- The vegetation found in rangelands includes tallgrass prairies, steppes (shortgrass prairies), desert shrub-lands, shrub woodlands, savannas, chaparrals etc.
- These 'Wild Open Spaces' **cover approximately half of the Earth's land surface** and half of western North America.

Reasons for Degradation

- The degradation of rangelands is primarily driven by the **conversion of pastures to cropland** and other **land use changes** resulting from **population growth** and **urban expansion**.
- Additional factors contributing to this problem include rapidly **increasing demands for food**, **fibre**, and **fuel**, **excessive grazing**, **abandonment**, and policies that incentivize **overexploitation**.

Significance of Rangelands

- They serve multiple purposes, including **livestock forage**, **wildlife habitat**, water and mineral resources, **wood products**, wild land recreation, open space, and natural beauty.
- They play a **vital economic role** in many countries and are **integral to cultural identities**.
- These lands are home to **one quarter of the world's languages** and host numerous **World Heritage Sites**.

5. Controversy Over Plantation of Eucalyptus in Kerala and Eco-Restoration

News: Environmentalists are protesting against the order of Government of Kerala allowing Kerala Forest Development Corporation (KFDC) to plant eucalyptus trees for its financial sustenance.

Issues with Plantation of Eucalyptus Trees in Kerala

- The Government of Kerala permitted KFDC to plant eucalyptus trees in 2024-2025 to boost its finances.
- The environmentalists have argued that eucalyptus is an exotic species and would **damage the forests**.
- **Damage to local floral species** will force the wildlife to **wander into inhabited areas** resulting in **increased human-animal conflict**.
- The Government of Kerala had published an **Eco-restoration Policy** in 2021. The Policy had sought to **address the proliferation of invasive species** not suitable to the local environment that had resulted in depletion of natural forests. The Government Order is against the spirit of the policy.

About Eco-Restoration

- Eco-restoration (Ecological Restoration) is the **process of assisting the recovery of an ecosystem** that has been **damaged**, **degraded** or **destroyed**.
  - It involves **creation of conditions conducive for recovery**. The plants, animals, and microorganisms thrive in conducive conditions and undertake the repair work to restore the ecosystem.
- It can involve **simple process** like **removing non-native plants and trees** (like eucalyptus and acacia in Kerala) and **re-introducing native species** or **complex activities** like **altering landforms** or **changing the hydrology** etc.
- Eco-restoration **creates healthier ecosystems** having **richer biodiversity**. This has several **associated benefits** like greater absorption of greenhouse gases, mitigating the impact of climate change, enhanced soil fertility, increased production of timber and other forest-based products.
- Restoration helps **control diseases** and **decreases the risk of natural disasters**.
- Ecosystem restoration also supports the achievement of **Sustainable Development Goals** (SDGs).

6. Critical Wildlife Habitat and Critical Tiger Habitat

News: The Supreme Court has directed the Government of Rajasthan to close 68 mines operating within a 1-kilometer radius of the Critical Tiger Habitat (CTH) of the Sariska reserve.

About Critical Wildlife Habitat (CWH)

- Critical Wildlife Habitats (CWHs) are designated areas within National Parks and Sanctuaries deemed necessary to remain '**inviolate**' for **wildlife conservation**.
- They are designated under **Section 2(b)** of the **Schedule Tribes and Other Forest Dwellers** (Recognition of Forest Rights) **Act**, **2006** (Forest Rights Act).
- The areas are notified by the **Ministry of Environment**, **Forest** and **Climate Change**.
- These areas are **scientifically identified** to be **maintained as inviolate zones** for wildlife conservation, ensuring that the rights of the Scheduled Tribes and other forest dwellers are not affected.
- The CWHs are declared on a **case-to-case basis**. It has to be established that the **activities or impact of the presence of holders of rights** (forest dwellers) upon **wild animals** is sufficient to **cause irreversible damage** and **threaten the existence** of species and their habitat.
- It has to be concluded that **other reasonable options**, such as, co-existence **are not available**. The displaced forest dwellers must be **rehabilitated with secure livelihood**.
- A CWH can extend to the entire area of the National Park or Wildlife Sanctuary as scientifically and objectively determined by an Expert Committee.

- The **State Governments can't divert the CWHs** (from where forest dwellers have been relocated) for any purpose other than wildlife conservation.
- The **consent of the Gram Sabha** has to be taken for the resettlement plan and package in writing.

Critical Tiger Habitat (CTH)

- Critical Tiger Habitat is defined under **Section 38V of the Wildlife Protection Act**, **1972**.
- According to **Section 38V(4)** a Tiger Reserve consists of 2 parts: **Core or Critical Tiger Habitat** and a **Buffer or Peripheral Area**.
- According to a clarification by the Ministry of Environment, Forest and Climate Change, '**Core or Critical Tiger Habitat**' (CTH) **is different from the** '**Critical Wildlife Habitat**' (CWH). **Tigers are territorial big cats**, hence considering their social land tenure dynamics, the 'CTH' has been viewed separately from the 'CWH', which is applicable to other wild animal species.
  - Based on deliberations with experts and simulation results from scientific data, it has been found that a **minimum inviolate area of 800-1200 km²** is required to sustain a **viable population of tigers** (20 breeding females).
- Establishing CTH involves 2 steps:
  - First, the CTH is established based on **scientific and objective criteria** that such areas are required to be kept as **inviolate for the purposes of tiger conservation**.
    - Buffer area is established where a **lesser degree of habitat protection is required** to ensure the **integrity of the critical tiger habitat** with **adequate dispersal for tiger species**.
  - Second, CTH is established as inviolate through the **voluntary relocation on mutually agreed terms** and conditions, that satisfy the requirements laid down in the Wildlife (Protection) Act, 1972.

7. Placental Mammals

News: Researchers at Stockholm University have found that brown fat, the typical mammalian heater organ, has evolved exclusively in modern placental mammals.

About Placental Mammals

- The placenta is a special organ that **forms during pregnancy in female mammals** (except **monotremes** and **marsupials**).
- It is made from both the mother's and the foetus' tissues.
- The placenta performs functions of:
  - **Transporting nutrients** from the mother to the foetus.
  - **Removing waste products** from the foetus.
- **Foetal Development**
  - Placental mammals **carry the foetus in the uterus** until it is born at an advanced stage.
  - The foetus gets nourishment through the placenta before birth.
  - The **placenta delivers nutrients and oxygen to the foetus** in the uterus.
  - This allows a long period of foetal growth in the uterus, so the foetus can become large and mature before birth.

Brown Fat

Brown fat (brown adipose tissue) is a type of body fat that **regulates body temperature in cold conditions**. Brown adipose tissue is **especially abundant in newborns** and in **hibernating mammals**. It is also present and metabolically active in adult humans, but its **prevalence decreases as humans age**. Its primary function is **thermoregulation**.

In addition to heat produced by shivering muscle, brown adipose tissue produces heat by **non-shivering thermo-genesis**. Brown fat activates right before the body starts to shiver. Brown fat also burns calories and stores energy.

Non-shivering thermogenesis (producing heat without shivering) uses **thermogenin protein** that enables mito-chondria to burn fatty acids and oxygen to generate heat.

- Placental mammals are classified under the subclass Eutheria. There are 4,000 identified species of placental mammals.
- Fossil evidence shows that the first placental mammals evolved between **163 million and 157 million years ago** during the Jurassic Period.
- Placental mammals include all living mammals **except marsupials** and **monotremes** (egg-laying mammals).
- Marsupials and monotremes have a less-developed and less-efficient placenta that limits the gestation.

About Marsupials
- Marsupials are a group of mammals that **give birth to relatively undeveloped young**.
- Marsupials have a short-lived placenta that nourishes their young for just a few days before they are born.
  o After birth, the young continue to **grow and develop outside the womb**, usually in a pouch.
  o The young get their nutrition from the mother's teats inside the pouch.
- Marsupials have an extra pubic bone called the epipubic bone to support their pouch.
- There are over **330 species of marsupials**. About two-thirds of them live in **Australia** and the other third live in South America. Examples of marsupials include **Kangaroos**, **Koalas**, **Opossums**, etc.

8. New Zealand Scraps 'Burp Tax' on Livestock

News: The Government of New Zealand has announced to scrap the 'Burp Tax' on Livestock.

About Burp Tax
- The tax was introduced by New Zealand in 2022. The tax was imposed on **greenhouse gas emissions from livestock**, particularly focusing on methane emissions. Methane is released by ruminant animals like cows and sheep, mainly through burping.
- The primary aim of the scheme was to **curtail methane emissions from ruminant species**.
- Methane is responsible for **30% global warming since preindustrial times**, second only to carbon dioxide.
- Animals such as cows, sheep, goats, and buffaloes have a digestive system that ferments food in their rumen, producing methane.
- New Zealand has ~10 million cattle and 25 million sheep. **Livestock is the source of nearly half of New Zealand's greenhouse gas emissions**. *(Refer EPIC December 2022 for India's Objection to Koronivia Joint Work on Agriculture).*

Removal of Tax
- **Farmer Protests**: Farmers have protested against the tax, arguing it has severely impacted their livelihoods. They have held several demonstrations since the imposition of tax.
- **Change in Government**: The current centre-right coalition led by the National Party decided to scrap the tax. The Government stated they are committed to reducing methane emissions through practical tools and technology that won't affect production or exports.

9. Environment Performance Index (EPI), 2024

News: The Yale Centre for Environment Law and Policy and the Columbia Centre for International Earth Science Information Network have released the Environmental Performance Index (EPI), 2024.

Key Highlights of Environmental Performance Index, 2024
- The EPI is released **every 2 years** (biennial).
- EPI 2024 has **58 indicators** under 3 main heads: **Ecosystem Vitality**, **Environmental Health** and **Climate Change**. The 58 indicators include **biodiversity**, **air pollution**, **air and water quality**, **waste management**, **emission growth rates**, **projected emissions**, etc. among others.

- In 2024, the EPI introduced the **biodiversity and habitat category** to check how countries have protected their existing biodiversity and ecosystems.
- **India has been ranked 176 out of 180 countries**. Only Pakistan, Laos, Vietnam and Myanmar fare worse than India. In 2022, India had ranked at the bottom (180).
- Among the three heads, India does not rank among the bottom ten countries only in climate change.
- India's performance lags in several indicators because of its **heavy dependence on coal**. Coal contributes to high greenhouse gas (GHG) emissions and air pollution levels. In air quality, India has been ranked 177th, above Pakistan, Bangladesh and Nepal only.
- **India has done relatively well on Climate Change** (133) because of investments in renewable energy. The Report noted that India will need an additional US$ 160 billion per year in investments in climate change mitigation to achieve its goals.
- At the global level, Estonia leads the index by followed by Luxembourg, Germany, Finland and the UK.

History, Art and Culture

1. Ahilya Bai Holkar

News: The 300th birth anniversary of Ahilya Bai Holkar was celebrated recently.

About Ahilya Bai Holkar

- She was born in **1725** in **Ahmednagar**, **Maharashtra**. At the age of 8, she was married to Khande Rao Holkar, son of Malhar Rao Holkar, who was a commander in the Army of Peshwa Baji Rao.
- After the deaths of her husband (in 1754), father-in-law (1766), and her son (in 1767), **she became the ruler of Indore in 1767**. She ruled till Indore till her death in 1795.
- She endeavored to establish herself as a leader in her own right. Her 30-year reign brought peace and financial stability to her kingdom.
- **Breaking patriarchal norms**, she displayed **exceptional leadership skills**. She was **trained in military affairs** by her father-in-law after the death of her husband.
- Recognizing societal constraints on her as a woman and a widow, she appointed Tukoji Holkar, a trusted soldier, as the commander of her army.

Contributions of Ahilya Bai Holkar

Spiritual and Architectural

- She resurrected and renovated *jyotirlingas* across the country as a tribute to Lord Shiva, including at Somnath, Varanasi, Trambak, Gaya, Pushkar, Vrindavan, Nathdwara, Haridwar, Badrinath, and Kedarnath.
- She installed idols in secret shrines under temples, providing additional security to protect against attacks and iconoclasm.

Civilizational Contribution

- She united her subjects with a shared cultural identity, regardless of their social or religious backgrounds.

Promotion of Crafts and Economic Development

- She promoted the traditional **Maheshwari saris**, **empowering women** through **skill development**. The production of Maheshwari saris **increased state revenue** and provided a **steady source of income for the weavers**.

Environmental Protection
- She made efforts to develop Indore, conserve forests and animals, and foster trade and commerce.

Promoted Inclusive Governance
- She promoted inclusivity. She made efforts and mainstreamed the Bhil and Gond castes into the society.

Legacy of Ahilya Bai
- Ahilya Bai's legacy extends beyond her contribution to temple renovation, encompassing overall governance that brought social harmony.
- She provided a model for *samajik samrasta* (social harmony) through inclusive and effective rules.
- While celebrated regionally, Ahilya Bai's national recognition is limited due to gender bias, despite commanding respect from contemporaries and later historians and intellectuals.

2. Vivekanand Rock Memorial

News: The Prime Minister recently visited the Vivekanand Rock Memorial in Kanyakumari.

About Vivekananda Rock Memorial
- The Vivekananda Rock Memorial is situated on a **small island near Kanyakumari**, **Tamil Nadu**.
- It is positioned about 500 meters away from the Vavathurai mainland. The memorial stands atop one of two rocks in the midst of the **Laccadive Sea**. This location is notably where the **Bay of Bengal**, the **Indian Ocean**, and the **Arabian Sea converge**.
- The memorial marks the site where **Swami Vivekanand is believed to have achieved enlightenment**. It was constructed in 1970 as a tribute to his profound impact on Indian philosophy and spirituality.
- The memorial features two main structures: the '**Shripada Mandapam**' and the '**Vivekananda Mandapam**'. It also houses a **life-sized bronze statue of Swami Vivekananda**, enhancing its spiritual and cultural significance.

About Swami Vivekananda
- Swami Vivekananda was originally named Narendranath Datta. He was a **major advocate of Vedanta**, which is one of the 6 schools of Hindu philosophy.
- He was born in 1863. He became a disciple of the mystic **Sri Ramakrishna Paramhamsa**.
- Vivekananda's teachings focused on **combining the spiritual richness of Indian traditions** with the **progress-driven approach of the Western world**.
- He is well-known for introducing Hinduism to the Western world at the **Parliament of World's Religions** in Chicago (1893), making a profound impact with his speeches. Upon returning to India, he founded the **Ramakrishna Order**, a religious and philanthropic organization, to continue his mission of service and spiritual development.
- Swami Vivekananda emphasized the **importance of meditation** and taught that true understanding comes from realizing the divine nature within each person.

3. Use of Wooden Tools During Stone Age

News: Researchers have found wooden tools which are 300,000-400,000 years old, indicating their use during the stone age.

About the New Research

- Archaeologists had found **300,000-400,000 year old wooden artefacts** from a coal mine in Schöningen, Germany between 1994 and 2008.
- A recently-published study indicates that these artefacts were not "sharpened sticks" but "**technologically advanced tools**" which required **skill**, **precision**, and **time to build**.
- The study reveals a variety of **woodworking techniques** such as splitting, scraping, and abrasion, indicating a **sophisticated understanding of wood manipulation**.
- The study also revealed that despite the abundance of wood as a resource, archaeological evidence of its use is scarce compared to stone, bone, and clay due to preservation issues. The site in **Schöningen provided well-preserved wooden tools due to its damp, oxygen-poor soil conditions**.
- This discovery challenges the notion that early humans primarily used stone, **highlighting a potentially greater role for wood**. This had led to a question whether the Stone age should really be called as **Wood Age**.
- A 19th-century Danish archaeologist, Christian Jürgensen Thomsen, had categorized human prehistory into the **Stone Age**, **Bronze Age**, and **Iron Age**.

Schöningen's Insights into Early Human Behavior

- **Discovery of Spears**: In the mid-1990s, archaeologist Hartmut Thieme discovered wooden spears alongside stone tools and remains of wild horses, suggesting **early humans were not mere scavengers but skilled hunters**.
- **Complex Tool Use**: Analysis of these tools using advanced technology like 3-D microscopy and micro-CT scanners revealed **sophisticated techniques such as wood splitting**, previously thought unique to modern humans.

About Stone Age

- The Stone Age is a prehistoric period that spanned from about **3.4 million years ago to 12,000 years ago**.
- This era accounts for **99% of human history** and is noted for the initial **use of stones for tools**, **weapons**, and **fire-making** by early humans.
- This period marks the evolution from **nomadic hunter-gatherers** to **settled agricultural societies**, including the domestication of animals and the innovation of tool usage.

Divisions of the Stone Age

- **Palaeolithic Period (Old Stone Age)**: From the first use of stone tools up to the end of the last Ice Age, ~ **2.5 million to 10,000 years ago**.
  o It is characterized by a **nomadic existence** with groups living in caves or forests. Technological and cultural development included the creation of simple stone tools and cave paintings.
- **Mesolithic Period (Middle Stone Age)**: It followed the Old Stone Age, lasting from the end of the last Ice Age to the onset of agriculture. A warmer climate supported early farming developments and the domestication of animals.
  o This featured more sophisticated stone tools, including the **prepared-core technique**, allowing the production of similarly shaped tools from the same stone.
- **Neolithic Period (New Stone Age)**: It began with the **start of farming** and lasted until the introduction of metal tools, marking the beginning of the Bronze Age. Transition from nomadic to sedentary lifestyles, forming villages and towns has been seen.
  o This age witnessed **animal domestication**, the advent of agriculture, and the creation of pottery and textiles.

4. Nyishi Tribe

News: Mountaineer and cricketer Kabak Yano has become the 5th woman from Arunachal Pradesh and the 1st woman from the Nyishi tribe to scale Mt. Everest.

About Nyishi Tribe

- The Nyishi are the predominant ethnic group in Arunachal Pradesh, India. The name "Nyishi" is derived from their language, where 'Nyi' means 'a man' and 'shi' signifies 'a being', collectively translating to 'a civilized human being'.
- The Nyishi language is part of the **Sino-Tibetan family**, though its exact origins are debated.
- Nyishis are the **largest tribal group in Arunachal Pradesh**, with a population of about 300,000.
  - They are primarily found in **8 districts of Arunachal Pradesh**. Smaller populations reside in Sonitpur and North Lakhimpur districts of Assam.
- They practice **slash-and-burn agriculture**, **hunting**, and **fishing**.
- They are **skilled in various handicrafts**, including weaving, cane and bamboo work, pottery, blacksmithing, wood carving, and carpentry.
- According to the 2011 Census, 31% of Nyishis follow Christianity, and 29% adhere to Hinduism.
  - Many continue to practice their indigenous religion, **Donyi Polo**, worshipping the **Sun** ("Donyi") and the **Moon** ("Polo") as divine entities.
- Nyishis celebrate three major festivals: **Boori-Boot** and **Nyokum** in February, and **Longte** in April.
  - These festivals are times of communal joy, aimed at appeasing deities to ensure bountiful harvests, health, wealth, and overall prosperity.
- **Polygyny is common** within the Nyishi community. They trace lineage **patrilineally** and are organized into various clans.
  - Nyishis do not have a caste system or rigid social classes, but they do recognize a form of social distinction that is flexible and not based on birth or occupation.
  - Women are highly regarded in Nyishi society, often seen as pillars of peace, progress, and prosperity. They also play a crucial role through the 'reciprocal marital exchange' system.

5. Satnami Community

News: The Satnami Community undertook massive protest against the district administration due to their dissatisfaction over police investigation into a case related to desecration of their religious symbol.

About the Satnami Community

- The term 'Satnami' is derived from 'Satnam' which translates to 'true name' (of God). The expression Satnam was popularized by Bhakti saint Kabir, although it is expected to have been coined earlier.
- The Satnamis are a **predominant group** within the 11% **Scheduled Caste** (SC) population in **Chhattisgarh**, believed to be an **offshoot of the Ravidassia community**.
- The community was founded in 1657, by **Bir Bhan** in **Narnaul**, **Haryana**. Udhodas, who was a disciple of Saint Ravidas, was the first priest or spiritual guru of the community.
- The Satnamis inhabit the plains of **central Chhattisgarh**, mainly in the old districts of Bilaspur, Durg, Rajnandgaon, and Raipur.
- The Satnamis emphasize 3 main principles:

o Adorning the attire of a Satnami devotee.

o Earning money through proper means.

o Not tolerating any injustice or oppression in any form.

About Satnami Revolt of 1672

- The Satnami revolt occurred during the reign of **Mughal Emperor Aurangzeb**, in today's **Mahendragarh district of Haryana**.
- The revolt began when a Mughal soldier killed a Satnami, leading about 5,000 Satnamis to take up arms.
- The Satnamis routed the Mughal troops, drove away the administrators, and set up their own administration.
- The revolt gained support in Agra and Ajmer, where people were **discontent with Aurangzeb's strict policies**, including the revival of the **Jizya tax**, **banning of music and art**, and **destruction of temples**.
- Aurangzeb took personal command and sent troops with artillery to suppress the revolt, resulting in an attempt to annihilate the Satnamis. The remnants fled and remained disorganized and leaderless for a long time.

About the New Movement

- The most significant Satnami group was **founded in 1820** in the Chhattisgarh region by **Guru Ghasidas**, a farm servant and member of a lower caste.
- Guru Ghasidas established the Satnam Panth (Sect of the True Name), providing a religious and social identity to many Satnamis.
- He preached a code of **ethical and dietary self-restraint** and **social equality**, and authored *Nirvan Gyan* to propagate his teachings.
- Throughout history, Satnamis have navigated their position within a larger Hindu hierarchy, influenced by connections with the Kabir Panth at different points.

6. Silk Road

News: A study has found that the main route of Silk Road underwent a change due to climate change.
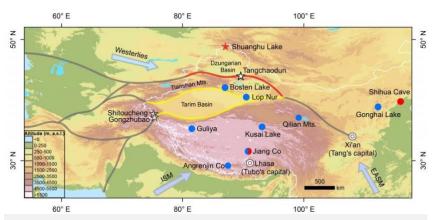
About Silk Road

- The **Silk Road** was a network of **Eurasian trade routes** active from the 2nd century BCE until the mid-15th century between Europe and Asia.
- Some historians also prefer to call it **Silk Routes** on the grounds that there was an **intricate web of land and sea routes** connecting Central, East, South, Southeast, and West Asia with East Africa and Southern Europe.
- The Silk Road derives its name from the highly **lucrative trade of silk textiles** that were **primarily produced in China**. Other lucrative commodities from the East included tea, dyes, perfumes, and porcelain.
- The West exported products like horses, camels, honey, wine, and gold.
- In addition to goods, the network **facilitated an exchange of ideas**, **religions** (especially Buddhism), **philosophies**, and **scientific discoveries**. The route played a crucial role in the **cultural and economic exchange** between the civilisations of Europe and Asia.
- It was highly decentralized network and **security was sparse**. Travelers faced **constant threats** of banditry and nomadic raiders, and long expanses of **inhospitable terrain**. As a result, the traders often relied on a **succession of middlemen based at various stopping points** along the way.
- The importance of the route declined from the mid-15th century as **sea routes were discovered** and the **trade shifted through sea routes**.
- A major route was the **Tarim Basin Route**. Caravans travelling to and from China's capital Xian used this route, which skirted the basin enclosed by the **Tianshan, Kunlun**, and **Pamir mountains**.

o Takla Makan desert is in this basin.

- After travelling around the Tarim Basin, the caravans travelled towards west to reach **Levant** (Syria, Jordan, the Holy Land, and Lebanon) and **Anatolia** (Turkey). From here, the goods were transferred to ships on the **Mediterranean ports**. The ships sailed onwards to Western Europe.

Shift in the Route

- Between 420–850 AD, the caravans no longer skirted the Tarim Basin. Instead, they began to use the **northern slopes of the Tianshan**. The area was known as the Junggar Basin, in the northern part of today's Xinjiang.
- Researchers have used the **chironomid fossils** (lake flies) to reconstruct past climate and found a period of **cooling (420-600 AD)** in the **Tarim Basin**. As a result, the meltwater and precipitation greatly reduced in the area, resulting in **shortage of water**. So the **route shifted to north** of Tianshan mountains.

Source: Down To Earth. Shift in the route northward of Tarim Basin.

- There was **warming after 600 AD**, but the **route did not shift southward**. Researchers attribute this to **political turmoil** in the Tarim Basin region between the **Tibetan Empire** and the **Tang Dynasty**.

Miscellaneous

1. Impact of Tonga Volcanic Eruption on Climate

News: A study published in the Journal of Climate investigated the climatic effects caused by the eruption of Hunga Tonga-Hunga Ha'apai volcano. It had erupted in January 2022, in Tonga.

Findings of the Study

- **Effect on Ozone Layer**: From August to December 2023, there was a large hole in the ozone layer partly because of the Hunga Tonga eruption. This effect on the ozone was **short-term** and not expected to last past 2023.
- **Changes in Weather**: The eruption caused some unusual weather changes:
  o Australia had a wetter summer in 2024, which is not usual for an El Niño year when it's typically drier.
  o Global average temperature went up by a tiny bit, ~0.015° Celsius.
- **Regional Climate Effects**
  o Northern Australia might experience colder and wetter winters than usual up to 2029.
  o North America could see warmer winters during the same period.
  o Scandinavia might have colder winters.
- **Atmospheric Changes**: The eruption changed the way air moves in the atmosphere, which could affect weather patterns.
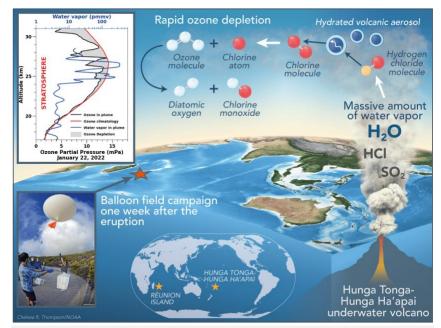
Uniqueness of Tonga Eruption

- The underwater volcano Hunga Tonga-Hunga Ha'apai erupted on January 15, 2022. This was extraordinary because it shot a **huge amount of water vapor** into the **stratosphere** (~15-40 kilometres above the Earth).

- Typically, volcanoes release smoke and sulphur dioxide which leads to a **cooling effect on Earth**.
  - This happens because sulphur dioxide turns into tiny particles that float in the air and reflect sunlight away from Earth.
- Being underwater, Hunga Tonga **didn't produce much smoke** but **sent 100-150 million tonnes of water vapor into the stratosphere**.
- In the stratosphere, **water vapor can harm the ozone layer** and act like a **greenhouse gas**, which might **warm the Earth**.

Source: NOAA. The impact of water vapours released during the volcanic eruption on the Ozone layer.

About Hunga Tonga-Hunga Ha'apai Volcano

- The volcano is situated in the **western South Pacific Ocean**, west of Tonga's main inhabited islands.
- It is a **submarine volcano**, 1 of 12 along the **Tofua Arc**, part of the larger **Tonga-Kermadec volcanic arc**.
- This arc has been formed by the **subduction of the Pacific Plate** beneath the Indo-Australian Plate.
- The volcano includes two small, uninhabited islands named **Hunga-Ha'apai** and **Hunga-Tonga**.

2. Stromatolites

News: Living stromatolites have been discovered on Sheybarah Island, on the northeastern shelf of the Red Sea in Saudi Arabia.

About Stromatolites

- These are layered structures formed by the **activity of microorganisms**, primarily **cyanobacteria** (blue-green algae). They are also known as **stromatoliths**.
- These organisms **trap and bind sedimentary grains** in shallow waters, creating layers upon layers until they form **mound-like structures**.
- Stromatolites typically display thin, alternating light and dark layers. Their shapes can vary, being flat, rounded (hummocky), or dome-shaped.

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Historical Significance

- They are ancient structures, and were most common during the Precambrian era, over 542 million years ago.
- They are **primarily marine**. However, some ancient stromatolites from more than 2.5 billion years ago are found in environments ranging from **intertidal zones** to **freshwater lakes**.
- In present times, **living stromatolites are rare** which are found in a **few salty lagoons or bays**, notably in Western Australia. Shark Bay is a key location for these living marine stromatolites.

Importance of Stromatolites

- **Fossil Records**: Stromatolites provide critical evidence of early life on Earth, with fossils dating back over 3.5 billion years.
- **Oxygen Production**: The cyanobacteria in stromatolites are **photosynthetic**. They produce oxygen as a byproduct of their metabolism.
- **Role in Understanding Evolution of Earth**: About 2.5 billion years ago, as stromatolites became more prevalent, they significantly increased the oxygen levels in the atmosphere. This transformation was crucial as it **changed the atmosphere from being rich in carbon dioxide to one rich in oxygen**. The rise in atmospheric oxygen **set the stage for the evolution of more complex life forms**, including the development of **eukaryotic cells**, which are cells with a nucleus.

3. Tracking SDG 7: The Energy Progress Report 2024

News: According to the Report, the world is not on course to achieve the SDG 7 for energy by 2030. SDG 7 aims to ensure access to affordable, reliable, sustainable and modern energy for all.

About the Report

- The Report is released annually by 5 custodian agencies: The **International Energy Agency** (IEA), The **International Renewable Energy Agency** (IRENA), The **United Nations Statistics Division** (UNSD), The **World Bank** and the **World Health Organization** (WHO).
- This report summarizes **global progress on energy access**, energy efficiency, renewable energy, clean cooking, and international cooperation to advance SDG 7.

Key Highlights

- **Insufficient Progress**: The share of renewables in global electricity consumption has increased to 28.2%. However, this is still insufficient to reach the targets set forth in the SDGs.
- The world remains **off-track** to **achieve universal access to clean cooking by 2030**. 2.1 billion people still live without access to clean cooking fuels and technologies, largely in Sub-Saharan Africa and Asia.
- The number of people living without electricity grew for the first time in over a decade.
- **Household air pollution** created by using **polluting fuels and technologies** for cooking results in **3.2 million premature deaths each year**.
- The **installed renewable energy-generating capacity per capita** has reached a new record in 2022 at **424 watts per capita** globally.
- However considerable **disparities exist between the developed and the developing countries**. Developed countries (1,073 W/capita) have 3.7 times more capacity installed than developing countries (293 W/capita).

4. Learnings from Ahmedabad's Heat Action Plan

News: A severe heat wave in Ahmedabad in 2010 had caused ~800 deaths. The City has implemented Heat Action Plan since 2013. Studies have shown its effectiveness in reducing heat-stroke related deaths.

About the Learnings from Ahmedabad's Heat Action Plan

- **Monitoring All-Cause Mortality**: In the 2010 heatwave in Ahmedabad, the number of deaths were very high despite lower reported cases of heat stroke. This highlighted the need to **monitor all causes of mortality**, not just heat stroke cases, for a more accurate assessment of impacts of heatwaves.
- **Simple and Well-Implemented Measures**: Ahmedabad's Heat Action Plan includes simple measures like **early warning systems**, **inter-agency coordination**, **public awareness campaigns**, and **readiness of medical services**. The important aspect is to ensure these measures are effectively implemented and accessible to the entire community, especially vulnerable groups. *(Refer EPIC April 2024 (click) for Heatwaves in India).*
- **Dedicated Nodal Officer**: The Plan has provision of appointment of a dedicated Nodal Officer for heat action planning with a long-term role, **enabling effective leadership**, **learning**, and **coordination**. The Nodal Officer receives meteorological warnings, shares alerts, and supervises the implementation of departmental measures based on alert levels (yellow, orange, and red).
- **Involvement of Facilitating Agencies**: They have involved local public health institutions, international knowledge partners, NGOs, and community-based organizations. These agencies bring expertise, help with media outreach, and assist municipal authorities in taking ownership and coordinating efforts.
- **Continuous Review and Improvement**: The Heat Action Plan is continuously reviewed and enhanced based on evaluations after each season. These evaluations analyze mortality and temperature data, compare it with previous periods, and **identify areas for improvement**. This iterative process has resulted in the **addition of new elements and improvements in planning and implementation over time**.
- **Customized Plans**: There is no universal heat action plan that fits every location. Each city and district must customize the framework according to their specific requirements, environment, and available resources.

Tailored plans implemented diligently can safeguard people from extreme temperatures and enhance resilience against climate change. They should be implemented across India. *(Refer EPIC April 2023 for Review of Heat Action Plans).*

5. Amendments to International Health Regulations

News: The 77th World Health Assembly has agreed to a package of amendments to the International Health Regulations (IHR, 2005). These amendments are based on 300 proposals from member countries following the COVID-19 pandemic.

About the Amendments to the International Health Regulations (IHR)

- The Amendments are aimed to **enhance global readiness** and **response** to **Public Health Emergencies of International Concern** (PHEIC) and **Pandemic Emergencies** (PE).
- The amendments will facilitate **equitable access to health products** and **mobilize financial resources** to help developing countries enhance their health systems under the IHR.
- **Key Features of the Amendments**
  - Provisions for **equitable access to health products** during emergencies.
  - Strategies to **mobilize financial resources** to **aid developing countries** in building and maintaining **necessary health capabilities**.
- The amendments were unanimously adopted on June 1, 2024, at the 77th World Health Assembly.
- The amendments represent steps toward **greater equity and global solidarity**.
- WHA also approved a **4-year strategy** with a budget of US$ 11.1 billion. The strategy aims to promote, provide, and protect health and well-being for all people.

o The strategy addresses critical issues like **climate change**, **aging**, **migration**, **pandemic threats**, and **equity**.

About the World Health Assembly

- It serves as the decision-making body of the World Health Organization. It is attended by delegations from all WHO Member States.

Functions

- **Policy Making**: It serves as a platform for WHO Member States to discuss and shape leadership, priorities, budgets, and policies in global health. It has a vital role in influencing the direction of future health initiatives.
- **Appointment of Director-General**: It appoints the Director-General.
- **Financial Oversight**: It oversees financial policies and reviews and approves the proposed program budget.

About the International Health Regulations (IHR)

- The IHR were **first adopted** by the World Health Assembly **in 1969**.
- They are **legally binding rules** that aim for international collaboration "*to prevent, protect against, control, and provide a public health response to the international spread of disease*".
- The IHR were last revised in 2005 following the outbreak of SARS in 2002-04.
- The IHR 2005 came into force in June 2007. 196 binding countries recognised that certain public health incidents, extending beyond disease, ought to be designated as **a Public Health Emergency of International Concern** (PHEIC), as they pose a significant global threat.

Criticism of IHR

- **Self-Assessment of Capacities**: IHR requires countries to assess their **disease surveillance** and **response capacities** and to identify if they can adequately meet their requirements. Several reports have observed that the self-assessment capabilities of countries are insufficient and the verification measures can be improved.
- **Travel and Trade Bans**: Experts have expressed concerns that travel/trade ban advisories are too stringent and sometimes avoidable. The travel bans imposed during Ebola outbreak in Africa were not necessary from the point of view of public health.
- **Reporting**: The reporting norms and mechanisms are not stringent enough and countries may delay the reporting of outbreaks.

6. Global Gender Gap Report, 2024

News: The World Economic Forum (WEF) has released the Global Gender Gap Report 2024, highlighting persistent gender inequality across various sectors worldwide.

About the Global Gender Gap Report

- The Global Gender Gap Report is published by the **World Economic Forum**.
- It assesses gender parity across **4 key dimensions: Economic Participation and Opportunity**, **Educational Attainment**, **Health and Survival**, and **Political Empowerment**.
- The index tracks the progress of countries' efforts towards **closing the gender gaps** in these dimensions over time since its inception in 2006.
- The level of progress toward gender parity (the parity score) for each indicator is calculated as the **ratio of the value of each indicator for women to the value for men**. A parity score of 1 indicates full parity. The **gender gap is the distance from full parity** (e.g., score of 0.6 shows 40% gap in achieving parity).

Key Findings of the Gender Gap Report, 2024

- The overall score for all 146 countries **stands at 68.5%** i.e., 31.5% of gender gap is left to be addressed.

- Among 101 countries covered every year since 2006, the gap has also improved by +0.1 points to reach 68.6%.
- Despite progress, **no country has achieved full gender parity**. However, **97% of economies have closed more than 60% of their gender gap**. In 2006, 85% economies had plugged 60% gender gap.
- **Iceland has maintained its position as the most gender-equal country** for the 14th consecutive year, with a score of 91.2%. Norway, Finland, and Sweden have consistently ranked in the top 5.
- 7 out of the top 10 countries belong to Europe. Europe also leads with 75% closure of gender gap, followed by North America (74.8%). South Asia is ranked 7th among 8 regions with gender parity score of 63.7%.
- At the current rate of progress, it will take **134 years to reach full gender parity** globally far beyond the **2030 SDG target**. *(Refer EPIC October 2023 (click) for Gender Issues: Nobel Prize in Economics 2023 and Gender Gaps in Employment).*

India's Performance
- **India has been ranked 129th in 2024**. India was ranked 127th in 2023.
- The decline has been primarily due to **small decreases in 'Educational Attainment'** (1.0 in 2023 and 0.964 in 2024) and '**Political Empowerment**' (0.253 in 2023 and 0.251 in 2024). Despite the overall decline, there was a **slight improvement in 'Economic Participation and Opportunity'** (0.367 in 2023 to 0.398 in 2024).
- **India ranks the 3rd-lowest among South Asian economies**. India fares worse than Bangladesh, Nepal, Sri Lanka, and Bhutan.

7. Child Nutrition Report 2024

News: The Child Nutrition Report 2024 has been released by UNICEF.

About the Child Nutrition Report 2024
- It examines the status, trends, inequities, and drivers of **child food poverty** in early childhood.
- It explores the **effects of child food poverty on undernutrition and poor development**. It addresses the impact of global and local food and nutrition crises.

Child food poverty is measured using the UNICEF and World Health Organization (WHO) dietary diversity score. To meet the *minimum dietary diversity* for healthy growth and development, children need to consume foods from **at least five out of the eight** defined food groups.

If children are fed:	0–2 food groups/day they are living in **severe child food poverty**	3–4 food groups/day they are living in **moderate child food poverty**	5 or more food groups/day they are **not living in child food poverty**
	Breastmilk	Grains, roots, tubers and plantains	Pulses, nuts and seeds	Dairy products	Flesh foods (meat, poultry and fish)	Eggs	Vitamin A-rich fruits and vegetables	Other fruits and vegetables

- The Report concentrates on low- and middle-income countries where most children experiencing **food poverty** reside.
- UNICEF defines **Child Food Poverty as children's inability to access and consume a nutritious and diverse diet in early childhood** (first 5 years of life).

Highlights of the 2024 Report
- **Global Impact**: Every one in four children under age 5 worldwide (27% or 181 million) faces severe food poverty and is at risk of life-threatening malnutrition.
- **Regional Distribution**: Over 66% of the 181 million young children living in severe food poverty are in **South Asia** and **sub-Saharan Africa**.
- **Key Countries**: 20 countries account for 65% children living in severe food poverty: Afghanistan, Bangladesh, China, Côte d'Ivoire, Democratic Republic of the Congo, Egypt, Ethiopia, Ghana, India, Indonesia, Myanmar, Niger, Nigeria, Pakistan, Philippines, Somalia, South Africa, Uganda, Tanzania, and Yemen.
- **Household Impact**: Children in both poor and non-poor households face severe food poverty.
- **Economic Distribution**: About half (97 million) of the children in severe food poverty live in middle- and upper-income households.

Pointly

1. **Lake Kariba**

   It is the **world's largest man-made lake and reservoir by volume**. It lies approximately 1,300 kilometres upstream from the Indian Ocean, along the **border between Zambia and Zimbabwe**. The **Kariba dam** is a **double curvature concrete arch dam** in the **Kariba gorge** of the **Zambezi river** basin between Zambia and Zimbabwe. The dam generates substantial electricity and bolsters a robust commercial fishing industry. Lake Kariba and its shores host a **diverse array of bird species**, such as fish eagles and cormorants.

   Due to the latest El Nino drought, water levels at Lake Kariba in Zimbabwe have dropped dramatically.

2. **Campi Flegrei**

   Campi Flegrei is also known as Phlegrean Fields. It is an active volcanic area situated near Naples, Italy. Campi Flegrei does not consist of a single volcano but is a **complex volcanic system** featuring multiple centers within a large caldera. One third of it is located beneath **the Tyrrhenian Sea**, situated between **mainland Italy and the island of Sardinia**. The caldera spans ~12-15 km (7.5-9.3 miles) in diameter. It was formed ~39,000 years ago following a massive eruption. It is recognized as the **largest active caldera in Europe**.

   It is classified as a **supervolcano** which is capable of producing eruptions with global consequences.

3. **Supervolcano**

   A supervolcano is a volcano that has had an eruption with a **Volcanic Explosivity Index** (VEI) **of 8**, which is the largest recorded value on the index. The volume of deposits for such an eruption is greater than 1,000 cubic kilometres (240 cubic miles).

4. **Volcanic Explosivity Index (VEI)**

   The Volcanic Explosivity Index (VEI) is a relative measure of the **explosiveness of volcanic eruptions**. **Volume of products**, **eruption cloud height**, and **qualitative observations** (using terms ranging from "gentle" to "mega-colossal") are used to determine the explosivity value.

   The scale is **open-ended** with the largest eruptions in history given a magnitude of 8. A value of 0 is given for **non-explosive eruptions**, defined as less than 10,000 m^3 (350,000 cu ft) of tephra ejected. Index 8 represents a **mega-colossal explosive eruption** that can eject 1.0×10^{12} m^3 (240 cubic miles) of tephra and have a **cloud column height of over 20 km** (66,000 ft).

5. **Mount Ibu**

   It is a **stratovolcano** situated on the northwest coast of **Halmahera island**, **Indonesia**.

It rises to an elevation of 1,377 meters above sea level. The volcano spans 16 km from east to west and 13 km from north to south. In 2023, **Mount Ibu recorded ~21,100 eruptions, making it the second most active volcano in Indonesia**.

6. **Mount Kanlaon (Canlaon)**

It is a **stratovolcano** located in the north-central part of **Negros Island**, **Philippines**. Kanlaon is one of the active volcanoes in the Philippines and is part of the Pacific Ring of Fire. The volcano has several pyroclastic cones and craters. It is made up of tropical volcanic materials, including sheeted lava flows, lahar deposits, airfall tephra, and apron pyroclastic materials.

It has erupted several times since 1886. The eruptions typically involve **phreatic explosions** of small-moderate size, producing minor ashfalls near the volcano.

7. **Delos Island (Greece)**

It is part of the **Cyclades archipelago** in the **Aegean Sea**. It was first settled in the 3rd millennium BC. It is **now largely uninhabited**. Its **rugged granite landscape** covers ~1.3 square miles. Delos is **known as the birthplace of Apollo and Artemis in Olympian Greek mythology**.

The island's Sacred Harbour features 3 conical mounds associated with a goddess (possibly **Athena**). UNESCO recognized Delos as a **World Heritage Site** due to its **exceptional archaeological remains**, and its influence on **Greek architecture**.

Scientists have expressed fear that Delos Island is '**at risk of vanishing**' within decades due to **rising sea levels** and geological processes.

8. **Aegean Sea**

It is located in the **East Mediterranean Basin**, with the Greek peninsula to the west and Anatolia (Asian side of Turkey) to the east. The **Bosphorus** and **Dardanelles Straits** connect the **Aegean Sea** to the **Black Sea** and the **Marmara Sea**, respectively. Most Aegean Islands belong to Greece. Turkey's notable possessions in the Aegean Sea are Imbros (Gökçeada) and Tenedos (Bozcaada) in the northeastern part.

The climate of the region is characterized by **hot**, **dry summers** and **mild**, **wet winters**, typical of Western Turkey and Greece. The **Etesian wind** significantly influences the weather in the Aegean basin.

9. **Crete Island**

During excavations for an airport in Crete, a large circular monument dating back 4000 years was unearthed. Crete is the largest island in Greece and the 5th largest in the Mediterranean Sea. It is located in the **southern part of the Aegean Sea**. The island is bordered by the Sea of Crete to the north, the Libyan Sea to the south, the Myrtoan Sea to the

west, and the Carpathian Sea to the east. The highest point on the island is Mt. Ida, also known as Psiloritis.

10. New Caledonia

It is situated in the **southwestern Pacific Ocean**, ~1,500 km east of Australia. It consists of the main island, **Grande Terre**, and several other islands.

It has been inhabited for several thousand years by indigenous groups. The most notable are **Melanesian Kanak people**. It is a **French overseas collectivity**, with substantial autonomy as per the 1998 **Nouméa Accord**. The President of the French Republic is head of State represented locally by a High Commissioner. Its **capital is at Nouméa**. It has population of ~ 270,000 as of 2019, with ~39% indigenous Kanak people. The rest include European Caledonians, Polynesians, and other groups such as Algerian, Vietnamese, and Indonesian. It has experienced political instability in recent times.

11. Disputed Islands in the Persian Gulf

Iran has protested against the joint statement made by China and the UAE regarding the **Abu Musa**, **Greater Tunb**, and **Lesser Tunb islands**. These are small disputed islands between **Iran and UAE**, located at the entrance of the **Strait of Hormuz** in the **Persian Gulf**. Iran claims that the islands were historically part of Persian territories until they were **occupied by the British** in the early 20th century. Iran took over these islands after the British forces withdrew in 1971.

The UAE says the islands belonged to the **emirate of Ras al-Khaimah** until Iran seized them by force just days before the **formation of the Emirati Federation in 1971** before **UAE's independence from Britain**.

12. Dnieper River

It is the **4th largest river in Europe** after the **Volga**, the **Danube**, and the **Ural**. It is located in Eastern Europe. It drains much of **Belarus** and **Ukraine**. The river originates in Russia, near Valday Hills, west of Moscow. It runs ~1,368 miles (2,201 kilometers) through western Russia, Belarus, and Ukraine before emptying into the **Black Sea**. It passes through several urban centers, like Kyiv, Zaporizhia in Ukraine.

13. Sunkoshi River

It is also known as the '**river of gold**'. It is part of the Koshi or **Saptkoshi River system**. This river is among the longest and most rafted in Nepal. The Sunkoshi originates from the Zhangzangbo Glacier in Tibet. It **merges with the Saptkoshi River** and eventually joins the Ganga in the Katihar district of Bihar, India. Under the **PLEASE** (Plastic Free Rivers and Seas of South Asia) program, 24,575 kg of waste has been removed from the Sunkoshi River banks and waste hotspots.

14. Koshi River (Kosi)

The Koshi River is a transboundary river that flows through China, Nepal, and India.

It serves as a prominent tributary of Ganga. The Kosi River has earned the nickname "**the sorrow of Bihar**" due to its **history of flooding** and **frequent alterations in its course** as it flows from Nepal to Bihar. Over the last 200 years, it has **shifted westwards** by approximately 112 km, causing significant changes to agricultural land.

It originates from the **Tibetan Plateau** and crosses the Himalayas and flows through the Mahabharat range and Siwalik hills.

It reaches the plains of eastern Nepal and finally meets Ganga in Bihar, India. The Kosi drains an area of 74,500 sq. km, with only 11,070 sq. km lying within Indian Territory. The Koshi River system drains about 45% of Nepal.

The Koshi River has seven major tributaries including Sun Koshi, Tama Koshi, Dudh Koshi, Indravati etc.

15. **Ujani Dam**

It is situated on the **Bhima River** near Ujjani village in the **Solapur district of Maharashtra**. It is an earth-fill and masonry gravity dam, built between 1977 and 1980. It stretches **2,534 meters in length** and stands **63 meters high**. The dam was primarily constructed to **provide irrigation water** and **hydroelectric power** to the region. Ujani Dam has a capacity of 117 thousand million cubic feet (TMC), divided into 54 TMC of live storage and 63 TMC of dead storage.

The dam has a hydroelectric **power generation capacity of 12 MW**. The water quality in Ujani Dam is notably poor, containing hazardous pollutants. This pollution primarily comes from Pune and other smaller cities along the Bhima River and its tributaries.

16. **Bhima River**

It is also known also as the **Chandrabagha River**. It is a major river in southwest India and is a tributary of the **Krishna River**. It originates in the **Bhimashankar hills** near **Karjat**, located on the western side of Western Ghats, in Pune District, Maharashtra. It flows southeast through Maharashtra, Karnataka, and Telangana, **merging into the Krishna River at Kadlur** (Raichur), **Karnataka**. It is bordered by the Western Ghats to the west, the Balaghat Range to the north, and the Mahadeo Hills to the south. Its major Tributaries includes rivers such as Sina and Nira. **Pandharpur**, which is an important pilgrimage center, is situated on the right bank of the Bhima River.

17. **Path to Peace Summit in Ukraine**

The Path to Peace Summit on Ukraine was held in Switzerland. The final Communiqué called for '**territorial integrity**' of Ukraine to be the **basis for any peace agreement** to end the Russia-Ukraine war. It also outlined a 'Path to Peace' and focused on nuclear safety, food security and humanitarian issues. **Russia was not invited to the Summit**. India along with countries like Saudi Arabia, South Africa, and the UAE refused to sign the Communiqué because of Russia's absence. India has said that any peace proposal must be acceptable to both Russia and Ukraine.

18. **International Organization for Migration**

It is part of the United Nations System. It was founded in 1951. It is headquartered in Geneva, Switzerland. It is guided by the principles in the **Charter of the UN**, with a focus on **upholding human rights for all**, respect for the rights, dignity, and well-being of migrants. It has 175 member States and 8

observer States. Its work focuses on three main objectives: **Saving lives and protecting migrants**, Finding solutions for displaced people, **Creating safe and regular migration pathways**. Its key areas of works include providing health services to migrants and displaced population, offer emergency relief and recovery programmes, and counter trafficking. It publishes reports such as **World Migration Report** and **Migration Health Annual Report**.

19. UN Supply Chain Forum

It was organized by UN Trade and Development (UNCTAD) and the Government of Barbados. It had over 1,000 participants from around the globe to address global disruptions, geopolitical tensions, climate change, and the impacts of the COVID-19 pandemic on international trade.

20. Commission on Crime Prevention and Criminal Justice (CCPCJ)

It is a functional commission of the **United Nations Economic and Social Council** (ECOSOC). It serves as the primary organ guiding the UN's activities in the fields of **crime prevention and criminal justice**. It provides a platform for Member States to share expertise, experiences, and information. It has 40 member states, elected by ECOSOC. It leads international efforts to **address national and transnational crimes**, including **organized** and **economic crimes**, and **money laundering**. It also works on enhancing the efficiency and fairness of criminal justice systems. It serves as the **governing body of the UN Office on Drugs and Crime** (UNODC).

21. Exercise Tarang Shakti

It will be the **Indian Air Force's first multinational air exercise**, to be held in August 2024. 10 countries will be participating in the exercise. Few others countries would be acting as observers. **Australia**, **France**, **Germany**, **Japan**, **Spain**, the **United Arab Emirates**, the **United Kingdom**, and the **United States** will be sending contingents. The plan is to **invite friendly foreign countries** with whom the IAF interacts regularly and has a certain degree of interoperability.

22. Astronomical Transients

Shrinivas Kulkarni, an Indian-American astronomer, has received the 2024 **Shaw Prize in Astronomy** for his contributions to understanding the **physics of astronomical transients**.

An astronomical transient is **any celestial object that experiences changes in brightness over short periods** of time. These phenomena are typically associated with **violent events in space**. Astronomers study transients to understand the sources and mechanisms of their violent behavior and to gain insights into more stable astronomical events. Such events include **Supernova explosions** and **Fast Radio Bursts**.

23. Blaze Star

It is a dim star located 3,000 light-years away from the solar system. It is situated in the **constellation Corona Borealis**, also known as the 'Northern Crown'. Blaze Star is a rare example of a **recurrent nova**, which means it **experiences explosive increases in brightness approximately once every 80 years**. The nova involves a **binary (two) star system** comprising a **white dwarf** and a **red giant**. The white dwarf draws material from the red giant, leading to periodic explosive increases in brightness. Unlike supernovae, novae do not destroy the star system but allow it to reset and repeat the cycle.

24. Magellan Mission to Venus

Recent research has unveiled new signs of volcanic activity on Venus.

This new signs of volcanic activity arise from analyses of **data collected by NASA's Magellan mission**, which **orbited Venus from 1990 to 1994**.

The mission was launched using the **space shuttle Atlantis**. It was the **first interplanetary mission initiated from a Space Shuttle**. The mission is named after the **Portuguese explorer Ferdinand Magellan**, renowned for being the **first person to circumnavigate the Earth**.
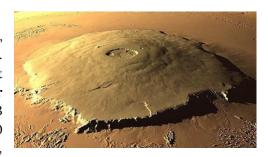
The main purpose of the Magellan mission was to map Venus's surface. Venus has a **very thick atmosphere which obscures optical observation**. This makes radar imaging necessary for studying its surface.

In October 1994, the **Magellan spacecraft was deliberately directed to crash into Venus to collect valuable data on Venus's atmosphere** during its final moments. It marked the first deliberate crash of an operational planetary spacecraft.

NASA is planning to launch **VERITAS Mission** (Venus Emissivity, Radio Science, InSAR, Topography, and Spectroscopy) for Venus in 2031. VERITAS will explore why **Venus, despite its similarities in size and composition to Earth, has followed a distinct evolutionary path**.

25. Olympus Mons

Scientists have **discovered frost on Mars' tallest volcano**, **Olympus Mons**, revealing an active water cycle on Mars. Olympus Mons is a **shield volcano**. It is the highest point on Mars and the **largest known volcano in the solar system**, standing at **16 miles** (24 kilometers) **high**, (~3 times taller than Mt. Everest. It is 340 miles (550 kilometers) wide. Olympus Mons is ~3.5 billion years old, indicating it formed early in Mars' history. It has a very flat structure with **slopes ranging from only 2 to 5 degrees**. The summit has a large depression called a caldera, spanning 50 miles (80 kilometers) wide.

26. Sub-Orbital Trips and Karman Line

India-born aviator and commercial pilot **Gopi Thotakura** became the first space tourist from India. He is flying on the **Blue Origin NS-25 mission**.

Space tourism is **human space travel for recreational or leisure purposes**. It is divided into different types which includes orbital, suborbital, and lunar space tourism.

Sub-Orbital Trips involve flights that **cross the Karman line** (~100 km above Earth), the boundary between Earth's atmosphere and outer space, **without entering orbit around Earth**. Most space tourism flights are sub-orbital trips. The spacecraft crosses the Karman line stays briefly in space, and then descends back to Earth.

Anything flying below the Karman line is classified as an **aircraft** and above it is a **spacecraft**.

27. Zero Debris Charter

It is an initiative of the **European Space Agency** (ESA). It aims to create a community of space actors committed to achieving specific **debris mitigation and remediation targets** by 2030. It is non-legally binding.

The Charter aims to **eliminate the creation of new space debris by 2030**. The charter stipulates that the probability of a mission generating space debris should be less than 1 in 1,000 for each object involved. The charter also sets a target of 99% success rate for post-mission disposal strategies, including the use of external means if necessary.

To achieve these goals, ESA will **develop innovative technologies for satellite end-of-life disposal**, **in-orbit servicing**, and **active debris removal**. The agency will also collaborate closely with regulatory bodies to ensure the effective implementation of these strategies.

28. Kavli Prize

It is an **international award** that recognizes **scientists** for their outstanding achievements in the fields of **astrophysics, nanoscience,** and **neuroscience.** It is awarded biennially since **2008.** It is named after Norwegian-American businessman and philanthropist **Fred Kavli**. It is awarded by the **Norwegian Academy of Science and Letters** in partnership with the Kavli Foundation.

It is distinct from the **Kavli Medal** which is awarded for **outstanding achievement in science and engineering in the fields of environment or energy**. Kavli Medal is awarded by the Royal Society (London) to a citizen of a Commonwealth country or the Irish Republic.

29. PraVaHa Software

It is a Computational Fluid Dynamics (CFD) software developed by **ISRO's Vikram Sarabhai Space Centre** for analyzing the **aerodynamics and thermodynamics of aerospace vehicles**. It helps simulate the flow of air around various vehicles like rockets and re-entry vehicles (with and without wings). It will help in **designing missiles**, **aircraft**, and **rockets**, and **providing solutions to complex aerodynamic problems**. It will also be used in the *Gaganyaan* **Programme** for analyzing the aerodynamics of human-rated launch vehicles, including HLVM3, Crew Escape System (CES), and Crew Module (CM).

30. RudraM-II Air-to-Surface Missile

It is being developed by DRDO and was recently tested from a Su-30 MK-I platform off the coast of Odisha. It is an **indigenously developed solid-propelled** air-launched missile system. The missile system integrates numerous cutting-edge technologies developed by several DRDO laboratories.

Air-to-surface missiles are guided missiles designed to be carried and **launched by aircraft and helicopters against ground (or sea surface-based) targets**.

31. *Divya Drishti*

It is a **biometric authentication system** designed by a start-up named Ingenious Research Solutions Pvt Ltd., in collaboration with the Centre for Artificial Intelligence & Robotics (CAIR), a DRDO laboratory based in Bangalore. '*Divya Drishti*' is an **AI tool** which **integrates facial recognition** with **immutable physiological parameters**, like gait and skeleton, to create a robust biometric authentication system.

The dual approach of combining facial recognition with gait analysis **minimizes the risk of false positives and identity fraud**, ensuring a **higher level of precision in identification**.

32. Centre for Artificial Intelligence & Robotics (CAIR)

It is a premier DRDO laboratory dedicated to research and development in Artificial Intelligence, Robotics, Command and Control, and Information and Communication Security. It develops products

for **secure battlefield communication** and **information management systems**, enhancing the effectiveness and robustness of **battlespace information systems**. It proactively addresses **emerging cybersecurity challenges**, ensuring robust defenses against evolving threats.

33. Convention on AI

The **Framework Convention on Artificial Intelligence and Human Rights**, **Democracy**, **and the Rule of Law** was adopted by the **Council of Europe** (COE) in May 2024 and will be available for signature from 5 September 2024. The framework convention is a legally binding treaty that sets out broad commitments and mechanisms for achieving them. It ensures **AI activities comply with human rights**, **democracy**, and the **rule of law**. It covers AI operations by both **public authorities and private actors**, emphasizing conformity with the convention's objectives.

Articles provide broad exemptions for national security, research, development, testing, and defense. The convention **does not specifically regulate military applications of AI**, reflecting the complexities and **lack of global consensus on such regulation**.

34. RoseTTAFold

It is a software tool that **uses deep learning** to quickly and accurately **predict protein structures** based on limited information. The software is built on a '**three-track**' **neural network** that analyzes **protein sequences**, **interactions between amino acids**, and potential 3D structures simultaneously. It has been developed by researchers at the University of Washington, US.

It is capable of predicting **protein-protein interactions**. It can also predict interactions and structures involving combinations of proteins, DNA, and RNA. It is capable of significantly reducing the time required to determine protein structures.

35. Joint Doctrine for Cyberspace Operations Released by Chief of Defense Staff (CDS)

The CDS has released the Joint Doctrine for Cyberspace Operations. It emphasizes understanding **military aspects of cyberspace operations** and provides conceptual guidance to commanders, staff, and practitioners for planning and conducting these operations. It aims to raise awareness among defense personnel at all levels about the **importance and execution of cyberspace operations**.

36. Cryonics

It is the practice of **freezing dead individuals**, to revive them in the future. The word cryonics is derived from the Greek word "krýos" meaning 'icy cold'. Cryonics aims to save lives by preserving individuals at **extremely low temperatures** until future medical technologies can restore them to full health.

Cryonic preservation can only be performed after an individual has been legally declared dead. The process begins shortly after death, with the body being packed in ice and transported to a cryonics facility. At the facility, **blood is drained and replaced with antifreeze** and **organ-preserving compounds** known as **cryoprotective agents**. The body is placed in a chamber filled with liquid nitrogen and preserved at -196 °C.

37. Phenome India Project

CSIR has completed the first phase of its **longitudinal health monitoring project**, **Phenome India**. Phenome India-CSIR Health Cohort Knowledgebase (PI-CheCK) was launched in December 2023. This is the first pan-India longitudinal **health monitoring study** that focuses on cardio-metabolic diseases. The initiative aims to create **India-specific risk prediction models for cardio-metabolic diseases**, including diabetes, liver diseases, and cardiac diseases.

The study is critical for **understanding the risk and prevalence of cardio-metabolic disorders** in the Indian population, which may vary from Western populations due to **ethnic diversity** and different lifestyle patterns. CSIR is leveraging this project to promote **Predictive**, **Personalized**, **Participatory**, and **Preventive** (P4) **healthcare**, which is customized for the unique phenotypic and genetic profiles of the Indian population.

38. Biohacking

It involves **altering one's biology**, often through **self-experimentation** and **technology**. It aims at **improving physical** and **cognitive functions**, **optimizing health**, and **reaching individual objectives**. There are various categories and mechanism for biohacking like **Age Biohacking** (cellular senescence focused on maintaining cellular health), **Energy Biohacking** (conserving energy by prioritizing proper rest and sleep), **Diet and Nutrition Biohacking** (consumption of supplements for blood sugar, continuous glucose monitors, use of metabolism monitoring devices, intermittent fasting practices etc.).

Biohacking is **popular among sports enthusiasts seeking a performance edge**. At present, **India lacks specific regulations directly addressing biohacking**. While the FSSAI introduced regulations for **nutraceuticals** *(Refer EPIC March 2022)* in 2016, however their enforcement is uncertain. The CDSCO has guidelines concerning the production and distribution of biological products like vaccines and gene therapies but these do not comprehensively address all biohacking practices.

39. Non-alcoholic Fatty Liver Disease

The disease is known as Metabolic dysfunction-associated Steatotic Liver Disease (MASLD). MASLD affects **25-30% of people globally**. In India, 38.6% of adults and 36% of obese children have fatty liver. High rates of MASLD are found in those with **diabetes** (55.5%-59.7%), **obesity** (64.6%-95%), and **severe metabolic syndrome** (73%). High carbohydrate intake, especially refined carbs and sugars, leads to high insulin levels. Persistent high insulin levels cause **insulin resistance**, converting excess glucose into fatty acids stored in the liver. The impact of MASLD can be reduced through early screening, advanced testing, regular health checks and lifestyle adjustments.

40. Enterobacter Bugandensis

Scientists from IIT Madras and NASA's JPL are collaborating to study the genomic, functional, and metabolic adaptations of **multi-drug resistant Enterobacter bugandensis** pathogen aboard the ISS. Enterobacter bugandensis is a **Gram-negative**, **rod-shaped bacterium**. It is found in various environments, including soil, water, and the gastrointestinal tracts of animals and humans. It can **cause various infections** in bloodstream, respiratory tract, urinary tract, and wounds. It has shown resistance to multiple antibiotics, making treatment challenging.

41. Mifepristone

The US Supreme Court has rejected a petition aiming to overturn the Food and Drug Administration's (FDA) approval of an **abortion pill Mifepristone**. It is used to **end pregnancies** by **blocking the hormone**

progesterone and **dilating the cervix**. It is generally taken with **misoprostol** to induce contractions and **end pregnancy within 10 weeks**. The success rate of this pill is **97.4%**.

42. Global Species Action Plan (GSAP)

It is an initiative designed to support the implementation of the **Kunming-Montreal Global Biodiversity Framework (GBF)** and **combat the growing loss of biodiversity worldwide**. It outlines the necessary actions to effectively conserve and sustainably use wild species while ensuring **equitable benefits**. It includes measures such as integrating species data into spatial planning and **establishing wildlife corridors** to facilitate animal migration.

43. Greening Education Partnership

UNESCO has launched the **Greening Curriculum Guidance** (GCG) and **Green School Quality Standards (GSQS)** under the **Greening Education Partnership**.

The Greening Education Partnership is a **global initiative that includes 80 member states**, aiming to address the **climate crisis through education**. It focuses on equipping learners with the knowledge, skills, values, and attitudes necessary to address climate change and promote sustainable development. The Pillars of Green Education include **Greening Schools**, **Greening Curriculum** (integrating climate education in schools), **Greening Teacher Training**, and **Greening Communities** (enhancing community resilience through learning centres).

44. Committee for Environmental Protection (CEP)

The CEP was established in 1991 under the **Protocol on Environmental Protection to the Antarctic Treaty** (the Madrid Protocol). The CEP advises the **Antarctic Treaty Consultative Meeting** (ATCM) on matters related to environmental protection and conservation in Antarctica.

45. e-Flow Monitoring System

The e-flow Monitoring System is developed by the **National Mission for Clean Ganga**.

It is an integral component of the **PRAYAG portal** which is a real-time monitoring centre for the **planning and monitoring of projects**, **river water quality**, and **other crucial parameters**. This platform facilitates **real-time analysis of the water quality of the Ganga**, **Yamuna**, and **their tributaries**, and **monitors the *Namami Gange* programme** activities at the central level. The performance of Sewage Treatment Plants (STPs) is monitored through the **Online Continuous Effluent Monitoring System** (OCEMS), ensuring that all STPs operate at their rated capacity. River water quality is also monitored at various locations. The launch of the e-flow Monitoring System marks a significant step towards ensuring the **continuous and sustainable flow of the Ganga River**.

46. Gandhi Sagar Wildlife Sanctuary

The Government of Madhya Pradesh has informed that it has completed its preparations for the reintroduction of the cheetahs from Africa in the **Gandhi Sagar Wildlife Sanctuary**. It is located on the northern boundary of the **Mandsaur** and **Neemuch districts** in **Madhya Pradesh**. It is named after the **Gandhi Sagar Dam** which is situated on the **Chambal River**. It was notified in the year 1974 and added to the list of sanctuaries in 1984. The **Chambal River flows through the sanctuary**. The sanctuary boasts of

Gandhi Sagar Wildlife Sanctuary

varied landscape, featuring **hills** and **plateaus**. It lies in the **Khathiar-Gir dry deciduous forests ecoregion**.

The sanctuary is home to **numerous sites of historical**, **archaeological**, and **religious importance**, including *Chaurasigarh*, *Chaturbhujnath* **Temple**, *Bhadkaji* **Rock Paintings**, *Narsinghjhar Hinglajgarh* **Fort** and *Taxakeshwar* **Temple**. The primary tree species in the sanctuary are khair, salai, kardhai, dhawda, tendu and palash. The sanctuary supports a diverse range of wildlife, including chinkara, nilgai, spotted deer, Indian leopard, striped hyena, jackal, crocodiles, otters, turtles and various fishes.

47. Kendu Leaves

It is a species of flowering tree in the family Ebenaceae. It is **native to India and Sri Lanka**. In various parts of India, it is also known as **tendu leaf**. It is produced in Madhya Pradesh, Chhattisgarh, Odisha, Andhra Pradesh, Jharkhand, Gujarat, and Maharashtra. The Kendu leaves are used to wrap *bidis*. Tribals living in remote forests, pluck it and sell them in the market to **earn their livelihood**. Traditional medical practitioners use it to **treat malaria**, **diarrhoea** and **dysentery**. Due to their **anti-microbial properties**, the leaves are **applied to cuts and bruises as well**.

It is called the **green gold of Odisha**. It is a **nationalized product**, like **bamboo** and the **sal seed**. It is one of the most important **non-wood forest products in Odisha**. Odisha is the 3rd-largest producer after Madhya Pradesh and Chhattisgarh.

48. Greater Adjutant Stork

It was once commonly found in southern Asia and mainland southeast Asia but is now **restricted to a small area Assam** in India. It is known for its distinct appearance, with a long neck, large bill, and a prominent gular pouch. It is a member of the stork family, *Ciconiidae*. There are only **3 known breeding grounds**, one in Cambodia and two in India (Assam and Bihar (Bhagalpur). In Assam, their habitat is primarily in the Brahmaputra valley, in **Guwahati, Morigaon**, and **Nagaon** districts. It has been classified as **Endangered** in the **IUCN Red List** and **Schedule IV** of the **Wildlife Protection Act, 1972**.

49. Spot-bellied Eagle Owl

The first photographic record of a spot-bellied eagle owl was reported in the **Pench Tiger Reserve** (PTR), Maharashtra. It is a **large bird of prey**. They are also known as the **forest eagle-owl**. It inhabits diverse environments such as **tropical and subtropical forests**, **woodlands**, and **savannas**. This bird is widely **distributed across India**, **Sri Lanka**, **Nepal**, **Bhutan**, **Bangladesh**, and various regions in **Southeast Asia**. Its distinctive appearance is characterized by a rich chocolate brown colour on the upper body, dotted with white spots. The species is primarily active at night. It preys on rodents, small mammals, reptiles, and insects. It is solitary and territorial, maintaining a specific home range. Its **IUCN Status** is **Least Concern** and it has been classified in the **Schedule IV** of the **Wildlife Protection Act**, **1972** and **Appendix II** of **CITES**.

50. Indian House Crow

The Government in Kenya has announced an action plan to **eliminate Indian House Crows in Kenya** because the bird (**invasive species**) has caused significant **negative impact on the local ecosystem**. It preys on local bird species, destroys nests and eats their eggs leading to decline in their population and disruption in local ecosystem.

Indian House crow is common in India, Nepal and Bangladesh. They belong to family Corvidae. They have a characteristic grey collar on their neck. Their **IUCN Status** is **Least Concerned** and they have been classified **Schedule II** of the **Wildlife Protection Act, 1972**.

51. Blue Sheep (Bharal)

The Blue Sheep is a species of caprid (goat-antelope) native to the high Himalayas. Blue refers to the **bluish sheen on its coat**, which can appear under certain lighting conditions.

Blue Sheep inhabit the **mountainous regions of the Himalayas**. They prefer steep, rugged terrains where they can easily navigate and **escape predators**. Males are generally larger than females and possess **distinctive backward-curving horns**. Their coat is dense and woolly, providing insulation against the cold, with a bluish-gray colour that blends well with their rocky surroundings.

They are herbivores, primarily grazing on grasses, herbs, shrubs, dry grasses and lichens (in winters).

Blue Sheep are distributed across the mountainous regions of Central/South Asia, including parts of China, India, Nepal, Bhutan, and Pakistan. They are abundant in the **Tibetan Plateau** and the **Himalayas**. Their **IUCN Status** is **Least Concern** (abundant and stable population). They face threats from habitat loss, poaching, and competition with livestock for grazing areas.

52. Himalayan Ibex

It is a subspecies of the **Siberian Ibex** which is a type of **wild goat** found in the **mountainous regions of Central Asia**. It is known for its **curved horns** and **agility on steep terrains**.

They inhabit high-altitude regions, typically between 3,200 to 5,000 meters (10,500 to 16,400 feet) above sea level. They are found in rocky, precipitous areas where they can **evade predators**. Their habitat includes **alpine meadows**, scree slopes, and cliffs, often in regions with **sparse vegetation**.

They are **social animals** and live in small groups, called herds. Their coat is thick and coarse, providing insulation against the cold.

They are herbivores and primarily graze on grasses, herbs, and shrubs. They are well-adapted to the limited food resources of their high-altitude habitats, often feeding on whatever vegetation is available.

They are predominantly found in **Jammu and Kashmir**, **Himachal Pradesh**, and **Uttarakhand**. Their **IUCN Status** is **Near Threatened**.

Wildlife authorities in Himachal Pradesh's have initiated surveys to estimate the populations of blue sheep (bharal) and Himalayan ibex. These are the primary prey for snow leopard.

53. Four-horned Antelope

A rare four-horned antelope has been sighted for the first time in the *Veerangana Durgavati* **Tiger Reserve**. It is also known as *Chousingha*. It is a small bovid antelope. They are the smallest found in Asia. They have a **yellowish-brown to reddish coat**, a slender build, small legs, and a short tail. One of their unique features is the presence of four horns. **Only males grow horns**, with one pair located between the ears and another on the forehead. These antelopes are typically **diurnal and solitary**, although they can sometimes be seen in loose groups of 3-4.

They are **endemic to India and Nepal**. In India, their range extends from the **foothills of the Himalayas** in the north to the **Deccan Plateau** in the south. They predominantly inhabit **open**, **dry**, **deciduous forests** in **hilly terrain**. They prefer areas with **significant grass cover** or **heavy undergrowth** and are usually found close to water bodies. Their **IUCN Status** is **Vulnerable**.

54. *Veerangana Durgavati* Tiger Reserve

Veerangana Durgavati Tiger Reserve is spread across **Sagar**, **Damoh**, and **Narsinghpur** districts in Madhya Pradesh. It is the seventh tiger reserve in Madhya Pradesh. The reserve encompasses areas within the **Nauradehi Wildlife Sanctuary** and **Durgavati Wildlife Sanctuary**.

The **Singorgarh Fort** is located within the reserve. Parts of the reserve fall under the Narmada and Yamuna River basins. The vegetation in the reserve is of the **dry deciduous**.

The chief floral elements include teak, saja, dhaora, ber, amla, and others. The major varieties of animals include tigers, leopards, wolves, jackals, Indian foxes, striped hyenas, nilgai, chinkara, chital, sambhar, black buck, barking deer, common Langur, and rhesus macaque.

55. Canopy Bridges for Gibbons

The Northeast Frontier Railway (NFR) has allocated funds to build canopy bridges, allowing India's only ape, Gibbon, to **safely traverse a railway track that divides its primary habitat in eastern Assam**. The Canopy bridges are designed by the Wildlife Institute of India (WII) in collaboration with NFR. The project involves NFR, Assam State Forest Department, WII, and other stakeholders.

These bridges will be installed at strategic points to **ensure the safe movement of gibbons** between the divided sections of the sanctuary. High-grade fastening materials will be used to **secure the bridges**. **Safety nets** will be installed below the bridges as a fail-safe mechanism. Lianas and creepers will be guided along the bridges to make them look natural. *(Refer EPIC September 2023 for Hollongapar Gibbon Sanctuary and EPIC July 2023 for Hoolock Gibbon)*.

56. Bioluminescent Mushroom Species

Researchers have discovered a rare species of bioluminescent mushrooms, scientifically known as *Filoboletus manipularis*, in the forests of **Kasaragod**. These mushrooms **emit a bright green glow at night**. They thrive in **tropical**, **humid environments**. They are found in **dense forests** with **abundant decaying organic matter** like fallen trees and leaves. Rich, moist environments provide the necessary nutrients and conditions for growth and bioluminescence.

The bioluminescence involves a chemical reaction between **luciferin** (a pigment) and luciferase (an enzyme) in the **presence of oxygen**. The reaction **produces light**, similar to bioluminescent organisms like fireflies.

The glowing mechanism is believed to **attract insects**. These insects help **disperse the mushroom's spores**, aiding in **reproduction** and **propagation**.

57. *Prerna Sthal*

The Vice President inaugurated the *Prerna Sthal* at the **Parliament House Complex**. The *Sthal* contains statues of India's prominent leaders and freedom fighters, which were formerly dispersed throughout different areas of the Parliament House complex. The initiative aims to **enhance visitor experience** by providing **easier access** and **utilizing modern technology**, such as QR codes, to narrate the life stories of these inspiring figures in Indian history.

58. Committee on the Installation of Portraits and Statues of National Leaders and Parliamentarians

The Committee is responsible for decisions regarding the placement of statues and portraits of national leaders and parliamentarians within the Parliament House Complex. It also handles the acceptance of such items from outside organizations and individuals, and determines their placement within the complex. It has not been reconstituted since 2019.

59. International Booker Prize

"Kairos" written by **Jenny Erpenbeck** (translated by Michael Hofmann) has won the 2024 International Booker Prize. The International Booker Prize is a prestigious **literary award** that recognizes the **best translated work of fiction from around the world**. It was established in 2005. The prize aims to encourage more publishing and reading of quality fiction from all over the globe, and to promote the work of translators who bring these stories to an English-speaking audience.

Books eligible for the International Booker Prize must be **translated into English** and **published in the UK or Ireland**. Both the author and the translator share the prize money equally.

60. National Commission for Indian System of Medicine (NCISM)

It is a **statutory body** constituted under the **NCISM Act**, **2020**, created by notification by the Union Government. The **Indian System of Medicine** regulated under NCISM includes: *Ashtang Ayurveda*, *Unani*, *Siddha* and *Sowa-Rigpa* system of medicine.

NCISM is composed of Chairperson, 15 ex-officio members and 23 part-time members. Its major functions include laying down policies to **maintain high quality** and **standards in education** of the **Indian System of Medicine** and developing **necessary regulations** for educational standards. It also lays down policies for **regulating medical institutions**, medical research, and medical professionals.

It ensures **State Medical Councils** comply with guidelines and regulations for effective functioning. It also promotes **observance of professional ethics** and **ethical conduct among medical practitioners**.

61. National Institute of Indian Medical Heritage (NIIMH)

It was founded in 1956. It is located in Hyderabad. It was previously known as the National Center of Indian Medical Heritage (NCIMH). It operates under the administrative control of the **Central Council for Research in Ayurvedic Sciences** (CCRAS), Ministry of AYUSH. It is dedicated to **documenting and showcasing medico-historical research** in Ayurveda, Yoga Naturopathy, Unani, Siddha, Sowa-Rigpa, Homoeopathy, Biomedicine, and related healthcare disciplines in India. It is known for its extensive collection of research materials on the History of Medicine, making it accessible globally. NIIMH houses more than **500 physical manuscripts**, alongside the **Medical Heritage Museum and Library**, featuring rare books and manuscripts dating back to the 15th century AD.

The WHO has designated the National Institute of Indian Medical Heritage (NIIMH), Hyderabad, as a **WHO Collaborating Centre** (CC) for "Fundamental and Literary Research in Traditional Medicine.

62. Central Council for Research in Ayurvedic Sciences (CCRAS)

It is an **autonomous body** under **the Ministry of AYUSH**, Government of India. Its headquarters are located in New Delhi, India. It serves as the **apex body** for **conducting**, **coordinating**, **formulating**, **developing**, and **promoting research** in Ayurvedic sciences on scientific lines. Its activities include Medicinal Plant Research, Drug Standardization, Pharmacological Research, Clinical Research, Literary Research & Documentation etc. It also has a Tribal Health Care Research Programme.

63. Herbicide Tolerant Basmati Variety

Indian Council of Agricultural Research (ICAR) has commercialized **herbicide-tolerant** (Ht) **basmati rice varieties**, which can **control weeds in rice crops** and **support direct seeding of rice**.

These varieties are engineered with a **mutated ALS gene** that allows for direct application of the herbicide Imazethapyr. Studies suggest that manual weeding at intervals (20 and 40 days after sowing) in DSR fields leads to better yields than using Imazethapyr.

64. Direct Seeded Rice

DSR is a modern rice cultivation method where **seeds are directly sown into the field**, bypassing the traditional **transplanting of seedlings from a nursery**.

This method is recognized for its **efficiency and sustainability**, benefiting farmers, the environment, and the economy. *(Refer EPIC May 2022 (click) for Benefits of Direct Sowing of Paddy)*.

65. Institute of Chartered Accountants of India (ICAI)

The Supreme Court confirmed a regulation from the ICAI that limits chartered accountants to accepting no more than the "specified number of tax audit assignments" in a financial year.

ICAI is a **statutory body** created by the **Chartered Accountants Act**, **1949**. It has been tasked with regulating the profession of Chartered Accountancy in India. It operates under the administrative control of the **Ministry of Corporate Affairs**. It ranks as the **2nd-largest professional body of chartered accountants globally**. It performs various functions like regulation of the profession (including education/examination), professional development, setting standards including ethical standards, review of financial reporting and policy advisory to the Government.

66. CSIR ASPIRE Scheme

It is an initiative by the Council of Scientific and Industrial Research (CSIR) to **provide research grants to women scientists and technologists**. The scheme aims to **support women in conducting research** in various fields of **science and technology** and promote their participation in the development of science and technology in India. The CSIR ASPIRE Women Research Grant is open to women scientists and technologists who are **Indian citizens** and have a **PhD degree in any area of science or technology**. The scheme is also open to women scientists and technologists who have taken a **career break due to family responsibilities** and **want to resume their research careers**. The scheme offers funding for international travel, enabling women scientists to attend conferences and workshops abroad, **facilitating global exposure** and **collaboration**.

67. One Week One Lab initiative

It is a countrywide campaign of CSIR.

It aims to showcase the **technological breakthroughs** and **scientific innovations of CSIR labs** across the country. There are **37 CSIR labs** dedicated to different areas of work, which will have an opportunity to present their achievements and inform stakeholders about their work.

68. **GREAT Scheme**

The **Grant for Research and Entrepreneurship across Aspiring Innovators in Technical Textiles** (GREAT) Scheme is designed to **support individuals and companies** in **translating prototypes into technologies** and **products**, including **commercialization**. The GREAT Scheme is aligned with the objectives of the **National Technical Textiles Mission**. It aims to boost the development of the **technical textiles startup ecosystem** in India. It is focused on niche sub-segments such as **biodegradable and sustainable textiles**, high-performance and specialty fibres, and smart textiles. It provides a **grant-in-aid of up to INR 50 lakh** for a period of up to 18 months.

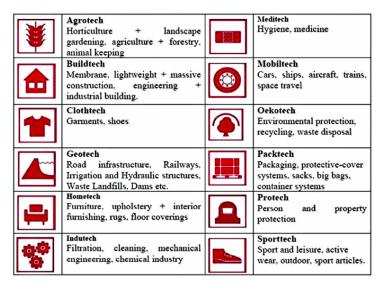69. **National Technical Textiles Mission (NTTM)**

It has been launched (for period 2020-21 to 2023-24) to increase the **penetration level of technical textiles in India**. The **Ministry of Textiles** is the nodal ministry. It aims to **position India as a global leader in technical textiles**. Its components include **fostering research**, innovation and development; promotion and **market development**; **promotion of exports**; along with **education**, **training** and **skill development**.

70. **Technical Textiles**

They are textile materials and products used for their **technical performance and functional properties** rather than their aesthetic or decorative characteristics.

They are called **functional textiles**; **industrial**, **engineering** or **hi-tech textiles** etc. They can be used individually or as a component/part of another product.

They are used individually to satisfy specific functions such as **fire retardant fabric** for **uniforms of firemen**. As a component or part of another product, they are used to

	Agrotech Horticulture + landscape gardening, agriculture + forestry, animal keeping		**Meditech** Hygiene, medicine
	Buildtech Membrane, lightweight + massive construction, engineering + industrial building.		**Mobiltech** Cars, ships, aircraft, trains, space travel
	Clothtech Garments, shoes		**Oekotech** Environmental protection, recycling, waste disposal
	Geotech Road infrastructure, Railways, Irrigation and Hydraulic structures, Waste Landfills, Dams etc.		**Packtech** Packaging, protective-cover systems, sacks, big bags, container systems
	Hometech Furniture, upholstery + interior furnishing, rugs, floor coverings		**Protech** Person and property protection
	Indutech Filtration, cleaning, mechanical engineering, chemical industry		**Sporttech** Sport and leisure, active wear, outdoor, sport articles.

enhance the strength, **performance** or **other functional properties of that product**.

They are becoming popular because of various benefits like **cost effectiveness**; **durability**; **high strength**; **light weight**; **versatility**; **customization**; **user friendliness** etc.

NOTE: *With effect from 1st February 2022, the monthly ForumIAS Epic Magazine, for the month will provide wholistic coverage for the said month up to 20th of the month. This ensures that issues / stories that occur after 21st of the month are allowed to fully develop and are covered wholistically in the next month.*