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General Studies I

1. Himachal Bill raises women's marriage age

Why in news?

The Himachal Pradesh Assembly has passed the **Prohibition of Child Marriage (Himachal Pradesh Amendment) Bill, 2024**. The Bill proposed to raise the minimum age of marriage for women from 18 to 21 years.

In order to do so, the bill amended the Prohibition of Child Marriage (PCM) Act, which was passed by Parliament in 2006.

Debate surrounding the minimum age for marriage for girls

The demand to raise the minimum age for marriage for girls to 21 in India has been growing due to several social, economic, and health-related factors:

- **Gender Equality and Education**
  - **Higher Education**: Raising the marriage age allows girls more time to complete their education. This will improve their **career prospects.**
  - **Empowerment**: Delaying marriage can help empower women by giving them more time to **develop skills and become financially independent.**
- **Health and Well-being**
  - **Maternal Health**: Early marriage often leads to early pregnancies, which are associated with higher risks of maternal and infant mortality.
    - Raising the marriage age allows girls to attain physical and emotional maturity, leading to safer pregnancies and better health outcomes for both mothers and children.
  - **Child Development**: Delaying motherhood gives women the opportunity to provide better care and nurturing to their children.
    - They are more likely to be emotionally and economically prepared.
- **Reducing Child Marriage**
  - **Combatting Child Marriage**: Child marriage is still prevalent in some parts of India, leading to various social issues such as **domestic violence, lack of education, and poverty**.
- **Economic Development**
  - **Workforce Participation**: Delaying marriage can increase women's participation in the workforce, which contributes to economic development.

Key challenges

- **Different age for attaining majority and being allowed to marry**
  o The Bill increases the minimum age of marriage for **females to 21 years, bringing it on par with that for males**.
  o However, the age of attaining majority is 18 years under the Majority Act, 1875.
  o This difference may have consequences regarding the rights and responsibilities of persons between 18 and 21 years of age.
- **Inconsistencies between the minimum age for marriage and various SC Judgements**
  o In 2018, the **SC said that right to marry is part of right to life under Article 21 of the Constitution**.
  o In another case in 2018, the Court held that when two adults consensually choose each other as life partners, it is a manifestation of their choice.
    • This choice is recognised under **Articles 19 and 21 of the Constitution.**
  o The current Bill restricts the right to marry before the age of 21 years.
  o Hence it raises question about the reasonableness of restriction for those between the ages of 18 and 21 years.
    • For any restriction of fundamental rights by law, there needs to be three criteria.
    • These are: a **public purpose, the restriction having a nexus with such purpose, and absence of a less intrusive way to achieve the purpose**.

Implementation challenges
- There has been limited success in curbing marriage of girls below the age of 18 years.
- In 2020, only 785 cases were registered under the 2006 act highlighting the fact that the detection of such marriages remains low.
- This raises the question of whether the increase in the minimum age would have any significant impact in reducing child marriages.

Himachal bill to raise women's marriage age
- The Himachal Pradesh Bill amends the Prohibition of Child Marriage (PCM) Act by raising the minimum marriage age for both males and females to 21 years, eliminating the previous age distinction.
- The **Bill defines a "child" as anyone under 21**, regardless of gender, and gives this new age limit overriding authority over any other law or cultural practice that might permit earlier marriage.
- Additionally, it extends the time frame for filing a petition to annul a child marriage, allowing individuals to do so within five years of reaching the age of majority, giving them until the age of 23 to annul the marriage.

Legislative Process and Constitutional Implications of Himachal Pradesh's Marriage Age Bill
- The **Himachal Pradesh Bill seeks to amend the Prohibition of Child Marriage (PCM) Act by raising the minimum marriage age for women to 21 years**, conflicting with the central law that sets it at 18.
- Since **marriage is a subject under the Concurrent List**, both the central and state governments can legislate on it.
- However, when a state law contradicts a central law, Article 254(1) of the Constitution renders the conflicting part of the state law void unless the President gives assent under Article 254(2).
- The Bill must therefore be reserved for President's consideration by the Governor of Himachal Pradesh.
- The President's assent is necessary for the Bill to become law, similar to the process seen with Uttarakhand's Uniform Civil Code (UCC) Bill.

2. We Can Hear the Apathy: Truth About Women's Abuse in Malayalam Cinema is Out. Does Anyone Really Care?

Context
- The release of the **Hema Committee (HC) report on August 19 marks a significant moment in the ongoing struggle for gender equality** within the Malayalam film industry.
- **This report, commissioned by the Chief Minister of Kerala** at the request of the Women in Cinema Collective (WCC), is a **critical reflection on the myriad issues faced by women in this sector.**
- The **reaction to the report has been mixed,** with sensationalism and apathy overshadowing meaningful engagement.
- Therefore, **it is important to delve into the report's findings, the systemic issues it highlights,** and the broader implications for gender equity in the film industry and beyond.

Hema Committee Report, its Significance and Broader Impact
- **A Comprehensive Documentation of Gender-Based Issues**
  - **One of the most critical aspects** of the Hema Committee report is **its role as a thorough documentation of the gender-based challenges faced by women** in the Malayalam film industry.
  - The **report is not limited to instances of sexual harassment**, though these are undoubtedly significant.
  - It **goes beyond to expose a wide array of constitutional, labour, and human rights violations** that women in the industry endure.
  - **By identifying at least 17 distinct forms of exploitation** across 30 different professional categories, the **report provides an unprecedented level of detail about the systemic issues within the industry.**
- **A Reflection on Women's Everyday Struggle**
  - These **findings are crucial because they bring to light the everyday struggles of women** working in various capacities within the film industry, struggles that have often been overlooked or dismissed.
  - For many women, **the film industry has been a space where their rights are routinely violated,** where power dynamics are skewed against them, and where their contributions are undervalued.

- o The **report's meticulous cataloguing of these issues offers a comprehensive understanding of the scale and scope of gender-based discrimination** in the industry.
- **Challenging Existing Power Structures**
  - o The **significance of the Hema Committee report also lies in its challenge to the entrenched power structures** within the Malayalam film industry.
  - o The **industry has long been dominated by a patriarchal culture** that marginalises women and perpetuates gender inequities.
  - o The report, **by exposing the extent of exploitation and abuse, directly confronts these power dynamics.**
  - o It **serves as a bold indictment of the industry's failure to protect the rights and dignity of women,** highlighting the urgent need for systemic change.
- **Empowering Women's Voices and Experiences**
  - o Another critical aspect of the report's significance is **its empowerment of women's voices within the industry.**
  - o For years, **women in the Malayalam film industry have been silenced**, their experiences of discrimination and harassment ignored or trivialised.
  - o The **Hema Committee report provides a platform for these women to share their stories,** validating their experiences and bringing them to the forefront of public consciousness.
- **A Broader Impact on Gender Equity Discourse**
  - o Finally, **the significance of the Hema Committee report extends beyond the Malayalam film industry.**
  - o It **contributes to the broader discourse on gender equity in the workplace, particularly in industries that have historically been male-dominated** and resistant to change.
  - o The **report's findings resonate with the experiences of women in other industries,** highlighting the universal challenges of gender discrimination, harassment, and inequality.

Troubling Aspects of Response to Hema Committee Report
- **The Noise of Sensationalism and Apathy**
  - o Despite the gravity of the report's findings, **the public discourse has largely focused on sensational aspects,** particularly sexual harassment, overshadowing the broader structural issues.
  - o This **sensationalism distracts from the need for systemic change**, reducing the conversation to isolated incidents rather than addressing the underlying causes of gender inequity.
- **The Tendency of Victim Blaming**
  - o **A troubling aspect of the response** is the tendency to push **the burden of resolution back onto the victims.**
  - o **Women who bravely shared their experiences with the committee are now being urged to take legal action**, a process fraught with challenges.
  - o The **legal system often requires evidence that is difficult to produce in cases of sexual harassment**, leading to further victimization and psychological distress for those involved.
- **Tendency to Universalise the Issue**
  - o Another significant issue is the tendency to universalise the problems identified in the report, thereby deflecting responsibility.
  - o **A member of a film association remarked, "Don't these issues exist in other industries, why only blame us?"** This argument is not only morally questionable but also fundamentally flawed.
  - o The **film industry, with its unique structure and lack of accountability, cannot be directly compared to other sectors.**
  - o The challenges faced by women in this industry are exacerbated by the absence of a formal organizational framework, making the need for targeted solutions even more pressing.
- **The Irresponsible Role of Bystanders and Government Apathy**
  - o Apathy, both from individuals and institutions, is a recurring theme in the response to the HC report.
  - o **Bystanders, whether in the industry or in government, often shirk responsibility, assuming that someone else will address the problem.**
  - o This **lack of accountability perpetuates the status quo**, allowing systemic issues to persist unchecked.
  - o The Kerala government's response has been particularly disappointing.
  - o While **the initial decision to establish the Hema Committee was a positive step**, the **subsequent delay in releasing the report and the lack of concrete action suggest a waning commitment to gender equity.**

- o **The government's inaction**, despite the detailed findings of the report, **highlights a broader problem of institutional apathy towards gender-related issues.**

Way Forward: The Need for Political Will and Systemic Change
- **Kerala, which became the first Indian state to achieve full literacy in 1991, owes much of its progress to the cultural revolution** initiated by social reformers and the Left government in 1957.
- Today, **the state faces a similar challenge: whether to lead the way in gender inclusion and safety in the film industry** or to succumb to apathy and inertia.
- The **government's actions in the coming months** will be crucial not only **for the future of women in Kerala's film industry but also for setting a precedent for other states.**
- The **choice is between superficial brand-building exercises and genuine political will to implement the necessary reforms.**
- The stakes are high, as the success or failure of these efforts will shape the future of gender-inclusive spaces in cinema and beyond.

Conclusion
- The **release of the Hema Committee report is a critical moment in the fight for gender equity** in the Malayalam film industry.
- However, **the response so far has been marked by sensationalism, apathy, and a lack of meaningful engagement** with the report's findings.
- The **Kerala government must demonstrate the political will to implement the necessary reforms, setting an example for other states** and industries to follow and **only then can the vision of a truly inclusive and equitable film industry be realised.**

3. National Monsoon Mission & Its Challenges

Why in the News?
A new mission to improve weather forecasting, with a budget of at least Rs 10,000 crore is expected to be launched soon. It is likely to be several times bigger than the existing National Monsoon Mission.

National Monsoon Mission:
- The **National Monsoon Mission (NMM)** has made significant advancements in weather and climate prediction by developing state-of-the-art models that are now fully operational. These models cover a wide range of forecasting periods, including:
  - o **Short-range (1-10 days)**
  - o **Medium-range (10-30 days)**
  - o **Seasonal (up to one season)**
- Over the past three years, the models created under the NMM have consistently demonstrated high accuracy in predicting key weather events across different time scales.

Objectives of NMM:
- The primary objective of the National Monsoon Mission is to **enhance monsoon prediction capabilities across India for all time scales.**
- To achieve this, the mission is implemented nationwide, encompassing all States and Union Territories (UTs).
- **Key Targets of the Monsoon Mission:**
  - o **Development of a Seamless Prediction System:** Establish a continuous prediction system using the Monsoon Mission models across various time scales:
    - ▪ **Seasonal Predictions:** Covering the entire monsoon season.
    - ▪ **Extended Range Predictions:** Up to four weeks.
    - ▪ **Short-range Predictions:** Up to five days.
  - o **International Collaboration**

- Initiate and coordinate partnerships between Indian and international institutes to develop systems for predicting extreme weather events and climate applications.
  - o **Implementation of Climate Application Systems**
    - Develop and implement systems for climate applications with significant social impacts, including:
      - **Agriculture:** Enhancing crop planning and yield predictions.
      - **Flood Forecasting:** Improving preparedness and response.
      - **Extreme Events Forecasting:** Mitigating the effects of severe weather conditions.
      - **Wind Energy:** Optimizing energy production based on weather forecasts.
  - o **Advanced Data Assimilation**
    - Develop an advanced data assimilation system to ensure the preparation of high-quality data for accurate model predictions.

Achievements and Impact of NMM:
- The NMM has successfully integrated these models into operational use, providing reliable forecasts that aid in disaster management, agricultural planning, and energy production.
- By improving the accuracy and timeliness of monsoon predictions, the mission plays a crucial role in mitigating the adverse effects of weather variability and supporting the socio-economic development of the country.

Challenges of National Monsoon Mission:
- **Complexity of Monsoon Dynamics:**
  - o The Indian monsoon is influenced by a multitude of factors, including **oceanic conditions, land surface processes, and atmospheric circulations.**
  - o The inherent complexity of these interactions makes accurate prediction challenging.
- **Data Limitations:**
  - o **High-quality data is crucial for accurate weather prediction models**.
  - o However, the availability and quality of observational data, particularly in remote and rural areas, can be inconsistent, leading to potential inaccuracies in predictions.
- **International Collaboration:**
  - o While collaboration with foreign institutes is a goal of the NMM, aligning different methodologies, standards, and data-sharing protocols across countries can be complex and requires sustained diplomatic and technical efforts.
- **Adaptation to Climate Change:**
  - o Climate change introduces new variables and uncertainties into weather patterns, complicating the prediction models.
  - o Adapting the NMM to account for these changes and improving resilience to climate variability is a critical challenge.
- **Regional Disparities:**
  - o There are disparities in how different regions of India benefit from the predictions made under the NMM.
  - o Ensuring that all regions, particularly the most vulnerable, receive timely and accurate forecasts is a challenge that needs continuous attention.

IMD to improve its weather forecasting capabilities:
- The **Indian Meteorological Department (IMD) is set to receive a significant upgrade to improve its weather forecasting capabilities, especially for localised and extreme weather events**.
- This new mission, with a budget of at least Rs 10,000 crore, aims to enhance IMD's accuracy in predicting weather at the local level, addressing the challenges exposed by recent extreme events like heavy rainfall, landslides, and floods.
  - o The new **mission is likely to be several times bigger than the existing National Monsoon Mission**.
- Despite improvements over the last decade, the IMD has struggled with accurate local predictions, particularly for extreme weather, which has become more frequent due to climate change.
- The **mission will focus on developing advanced computer simulation models tailored to India's unique climate scenarios** and further strengthening the country's weather monitoring infrastructure.
  - o It will include the deployment of more sophisticated instruments like Doppler radars and new weather satellites.

- Additionally, the mission plans to integrate artificial intelligence and machine learning (AI/ML) to improve hyperlocal forecasting, with successful experimental models already showing promise in cities like Mumbai.

4. Fallouts of Lithium Mining

Why in News?

According to a new study, **Chile's Atacama salt flat (flat expanses of ground covered with salt and other minerals) is sinking at a rate of 1 to 2 cm per year due to lithium brine extraction**.

The process of extracting lithium from brine involves pumping salt-rich water to the top and through a sequence of evaporation ponds in order to recover lithium.

What is Lithium Mining?

- Lithium mining refers to the **extraction of lithium primarily from brine water and hard-rock (spodumene) deposits.**
- **Brine extraction**, which accounts for **66% of the total lithium production**, involves pumping underground brine to the surface and allowing the water to evaporate, leaving behind lithium carbonate.
- **Hard-rock mining** involves extracting lithium-bearing minerals from rock through traditional mining techniques.

Country	Production (metric tons)	Known Reserves (tons)
Australia	86,000	6.3 million
Chile	44,000	9.3 million
China	33,000	5.1 million
Argentina	9,600	19 million
Brazil	4,900	0.47 million
Zimbabwe	3,400	0.50 Million

- **Lithium production** has dramatically increased over the past decade.
  - The global output surpassed 100,000 tonnes (tonne = metric ton) for the first time in 2021, a fourfold increase from 2010.
  - In 2022, global lithium mines produced an estimated 130,000 metric tons.

Lithium Reserves and Mining in India:

- The Geological Survey of India (GSI) had for the first time in India's history established Lithium inferred resources of 5.9 million tonnes in **Jammu and Kashmir's Reasi district.**
- Months after India's first lithium reserves, **the GSI has found another reserve of the crucial mineral** in Degana in Rajasthan's Nagaur district.
  - These reserves are believed to be much bigger in quantity (than found in J&K) and **can meet 80% of the total country's demand.**
- The Ministry of Mines successfully **auctioned off India's first lithium block** in Chhattisgarh's **Korba** district (Katghora region) recently.

IN LITHIUM SEARCH

Note: During field season programme 2022-23, GSI has taken up 18 projects on Lithium and associated elements in these states.

Source: Ministry of Mines, Lok Sabh reply, 08.02.2023

Environmental Challenges Posed by Lithium Mining:

- **Deplete water resources:** Extracting one ton of lithium requires approximately 500,000 litres of water, which can deplete water resources in arid regions and impact local communities and ecosystems.
- **Contaminate soil and water sources:** The chemicals used in lithium extraction, such as sulfuric acid, can contaminate soil and water sources, posing risks to human health and wildlife.
- **Carbon emissions:**

- o Lithium mining, particularly from hard rock sources, is energy-intensive, requiring substantial electricity for crushing, grinding, and chemical separation processes.
- o This energy often comes from **non-renewable sources,** exacerbating carbon emissions and the carbon footprint of lithium production.

Fallouts of Lithium Mining in Chile:
- The research has shown that lithium mining (over the years) has had severe environmental fallouts, especially in countries such as Chile.
- The satellite data collected between 2020 and 2023 shows **deformations in the Earth's crust of Atacama salt flat** - one of the largest sources of lithium in the world.
- The worst affected areas are those where mining companies are doing most of their pumping of lithium-rich brine.
- That is happening because the **pumping takes place at a faster rate than the recharge** of aquifers, leading to **subsidence** or the downward vertical movement of the Earth's surface.

5. Law and Impunity: Why Laws on Sexual Violence Continue to be Skewed Against Women

Context
- **Sexual violence in India continues to be a pervasive and distressing issue**, exacerbated by a political, legal, and social order that fails to address the deep-rooted impunity surrounding these crimes.
- **Despite various legal reforms and public outcries, the system remains largely ineffective** in protecting victims and ensuring justice.
- Therefore, **it becomes imperative to delve into the multifaceted nature of this crisis, highlighting the shortcomings of recent legal changes, the systemic failures in addressing sexual violence**, and the broader implications for society.

The Systemic Impunity of Sexual Violence
- **The case of the horrific rape and murder of a resident doctor at RG Kar Medical College** in Kolkata serves as **a stark reminder of the systemic impunity that sexual violence offenders enjoy in India.**
- This **incident triggered widespread protests and demands for justice**, reflecting the collective trauma and anger within the community.
- However, **the transfer of the case to the Central Bureau of Investigation (CBI) following the Calcutta High Court's intervention reflects the pervasive mistrust in the local justice system** and this mistrust is not unfounded.
- The **Bharatiya Nyaya Sanhita (BNS), introduced as a reform to the penal code under the pretext of gender justice, has failed to create a culture of deterrence.**

An Analysis of Legal Reforms and Their Limitations
- **Symbolism Over Substance**
  - o The **renumbering of crimes against women in the penal code is largely a symbolic act** that does not translate into real-world deterrence.
  - o The **underlying assumption is that by merely placing these crimes at the forefront, the law will somehow command greater respect** and adherence.
  - o However, **legal reforms that focus on symbolic gestures rather than substantive changes do little to create a culture of accountability.**
  - o **The persistent high rates of sexual violence** across different states in India, whether in Uttarakhand, Bihar, or Maharashtra, **underscore the failure of such reforms to make a tangible impact on the ground.**
- **The Death Penalty as a Controversial Measure**
  - o This **decision has sparked significant debate**, with many feminists and legal scholars arguing that it does not serve as an effective deterrent.
  - o Moreover, **the death penalty does not address the root causes of sexual violence**, such as societal attitudes, gender inequality, and the failure of institutions to protect women.
  - o The **imposition of the death penalty also reflects a broader trend within the legal system to prioritise punitive measures over preventive ones.**

- **Overlooking Structural and Cultural Factors**
  - **Legal reforms** cannot operate in a vacuum; **they must be accompanied by changes in societal attitudes and institutional practices.**
  - The **failure to address these underlying issues limits the effectiveness of the BNS** and similar legal reforms.
  - For instance, **the law does not adequately tackle the issue of impunity, where powerful individuals or groups can escape accountability** due to their social, economic, or political influence.
  - **Moreover, the focus on punitive measures such as the death penalty detracts from the need to strengthen the institutional frameworks** that support survivors of sexual violence.
- **Disregard for Feminist Recommendations and Verma Committee Recommendations**
  - The **Verma Committee, established in the wake of the 2012 Delhi gangrape, provided comprehensive recommendations** aimed at addressing sexual violence in a holistic manner.
  - **One of the key recommendations was to make those in positions of command responsible for preventing mass-scale sexual violence**, thereby ensuring accountability at all levels.
  - However, **this recommendation was ignored in the drafting of the BNS**, reflecting a reluctance to challenge entrenched power structures.
  - The **failure to incorporate feminist perspectives into legal reforms also manifests in the expansion of state control over sexuality**, rather than the protection of bodily autonomy for all victims of sexual violence.

Some Other Broader Systematic Failures in Addressing Sexual Violence
- **Institutionalisation of Backlash**
  - The **institutionalisation of backlash against those who fight sexual harassment**, even within the courts, **undermines the possibility of any meaningful change in rape culture.**
  - **The Vishaka judgment, which aimed to empower women-led processes in addressing sexual harassment, has been effectively undermined** by handing over these processes to employers with vested interests.
  - The **Hathras case is a glaring example of how protest and dissent are criminalised**, reinforcing a patriarchal caste order that perpetuates sexual violence.
- **Mass-Scale Defunding of Women's Groups**
  - One of the **most alarming developments in recent years has been the mass-scale de-funding of women's groups** that have historically worked with rape survivors and victims of gender-based violence.
  - This **de-funding has resulted in a significant loss of experience and expertise**, leaving survivors with even fewer resources and support systems.
  - **As institutions gather impunity, women are left more vulnerable**, particularly in environments where nepotistic and arbitrary processes in admissions and recruitment prevail.
- **The Failure to Provide Safe Spaces and Compensation**
  - The state's neglect in providing safe shelters, financial support, and appropriate compensation to survivors reflects a troubling disregard for the rights and dignity of women.
  - **The language of compensation has been so degraded that it is often viewed with suspicion, perpetuating harmful stereotypes that women fabricate stories** of sexual violence for monetary gain.
  - This cynical perspective further marginalises survivors and undermines their quest for justice.
- **The Monopolisation of the Discourse on Sexual Violence**
  - The male-dominated state apparatus continues to shape the discourse on sexual violence in ways that undermine feminist perspectives.
  - **Discussions about forensic evidence, such as the quantity of semen in autopsy reports, often devolve into pornography by other means**, reinforcing male bonds over the violated bodies of women.
  - **This reflects a broader societal issue, where patriarchal and majoritarian narratives dominate,** marginalising feminist constitutionalism and the empowering languages that have emerged from feminist legal advocacy.

The Role of Tort Law and Intersectionality in Addressing Sexual Violence
- To create a culture of deterrence, **it is essential to develop a safety jurisprudence that incorporates tort law, holding institutions accountable for failing to provide safe environments for women.**
- The **law on constitutional torts should be applied more rigorously** to institutions that neglect their duty of care.
- **Additionally, intersectionality must play a central role in addressing the unique challenges faced by women from marginalised communities**, such as Muslim and Dalit women, who face routine discrimination and violence.

- The **leaking of documents, photographs, and videos by both state and non-state actors,** often for political gain, **further exacerbates the trauma of survivors.**
- The **circulation of such material, particularly 'atrocity videos,'** highlights the ways in which sexual violence **is exploited for competitive party politics, deepening the crisis of impunity.**

Conclusion
- **The enduring crisis of sexual violence in India reflects the deep-seated flaws** within the political, legal, and social systems.
- **Despite numerous legal reforms and public outcries, the culture of impunity remains pervasive,** perpetuating violence and injustice.
- **To address this crisis, it is essential to challenge the patriarchal and majoritarian narratives that dominate the discourse, implement meaningful reforms that protect victims**, and hold institutions accountable for their failures.

6. Centre debates taking caste count during Census

Why in news?
The Union **government has not yet decided on conducting the next Census but is actively discussing the possibility of including caste enumeration**. The demand for a caste Census has delayed the process, as any inaccuracies could complicate the exercise.

Census in India
- **About**
  - Population Census provides **basic statistics on state of human resources, demography, culture and economic structure at local, regional and national level.**
  - Beginning in the year 1872, when the first census was conducted non-synchronously, the census enumeration exercise in India is carried out in every 10 years.
    - The **first synchronous census was taken under British rule in 1881, by W.C. Plowden, Census Commissioner of India.**
  - The responsibility of conducting the decadal census rests with the Office of the Registrar General and Census Commissioner of India, Ministry of Home Affairs.
- **Legal/Constitutional basis of Census**
  - Population census is listed in **Union List (entry 69)** of Seventh Schedule in Indian Constitution.
  - Census is conducted under the provisions of the **Census Act, 1948**.
- **Process of census enumeration**
  - **The Census Operations in India have been carried out in two phases:**
    - House-listing and Housing Census and
    - Population Enumeration.
  - The **Population Enumeration follows the Housing Census within a gap of six to eight months**.
  - In Population Enumeration phase each person is enumerated and her/his individual particulars like Age, Marital status, Religion, mother tongue etc.
- **Some of the features of upcoming census**
  - The upcoming decadal Census of India will be the **16th in series and 8th after independence**.
    - India's Census enumeration was scheduled to take place in 2021.
    - It was postponed due to the outbreak of Covid-19 in 2020.
  - In the **history of Indian Census, for the first time, the Census data will be collected digitally i.e., on Mobile App in the ensuing census.**
  - Also, self-enumeration facility will be provided for the first time in the forthcoming Census.

Caste census
- **About**
- Caste census means **inclusion of caste-wise tabulation of India's population in the Census exercise**.
- The debate over conducting a caste census has become more complex than anticipated.

- o Opponents view it as a politically motivated move rather than one rooted in justice, while proponents see it as an opportunity to transform state authority into an ethical entity.
- **Background**
  - o **Caste was enumerated in British India Censuses (1881-1931).**
  - o Post-Independence, the 1951 Census excluded caste enumeration except for SCs and STs, who continue to be counted.
    - Caste data were collected for the 2011 census but the data was never made public.
  - o In 1961, the GOI recommended states conduct their own surveys for state-specific OBC lists, as there were no central reservations for OBCs at that time.
  - o Though Census is a Union subject, **the Collection of Statistics Act, 2008** allows States and local bodies to gather necessary data, as seen in Karnataka (2015) and Bihar (2023).
- **Demand for a caste census in India**
  - o The **demand for a caste census in India extends beyond political motives**, driven by the need to support the world's largest caste-based affirmative action program.
  - o Caste identities play a crucial role in determining reservations in educational institutions and government jobs.
  - o **Scheduled Castes (SCs) and Scheduled Tribes (STs) have quotas based on their population percentages, while Other Backward Classes (OBCs) have a 27% reservation, determined by the BP Mandal Commission based on caste.**
- **Need for caste Census**
  - o The necessity of a caste census in India arises from the outdated reliance on caste estimations from 1931 for current welfare policy formulation, which is problematic for those affected by these policies.
  - o A new caste census would provide updated data for more accurate policymaking.
  - o Previous estimates by the NSSO and UDISE show significant OBC representation in primary education, but current data on caste-based privileges is lacking.
  - o The **Supreme Court's Indra Sawhney decision (1992) mandated regular data collection to prevent privileged castes from exploiting quota benefits.**
  - o Proponents of the caste census, including leaders like Bihar's Nitish Kumar and Tamil Nadu's MK Stalin, argue that it will enable more precise social programs and address the imbalance in job and education opportunities among castes.
  - o It will provide reliable data on educational and economic disparities, ensuring that opportunities are fairly distributed.

Argument against caste census
- o Critics say it could **deepen social divisions**.
  - Documenting caste data could deepen existing prejudices and entrench caste-based discrimination, rather than reducing it.
- o **Many opponents claim that that it is an administrative nightmare.**
  - The 2011 SECC, which identified over 46 lakh castes and sub-castes, exemplifies the difficulty in accurately categorizing such a diverse population.
  - It might lead to unreliable data that might complicate policymaking rather than clarify it.
- o **Opponents also say that it would fuel demands for increased reservations.**
  - Political parties could exploit caste census results to mobilize vote banks, potentially leading to increased caste-based polarization and conflicts.
- o Analysts argue that a **caste census could detract from more pressing issues like poverty, education, and healthcare, which require attention across all communities, regardless of caste**.
  - By focusing on caste, the government might overlook broader socio-economic inequalities that affect people from all backgrounds.

7. Existential Threats Faced by the Panama Canal

Why in News?

The decline in water levels of Lake Gatun, the artificial reservoir key to the Panama Canal system's operation, as a result of climate change induced drought, is posing an existential threat to the canal.

About the Panama Canal:

- **Location:**
  o It is an artificial 82-km waterway in Panama that **connects the Atlantic Ocean with the Pacific Ocean**, cutting across the Isthmus of Panama.
  o **It was constructed by the US** (at a cost of 375 million dollars) and the first ship passed through the canal on August 15, 1914.
  o The US government owned and operated the canal until 1999 when the Panamanian government started controlling **one of the most important shipping lanes in the world.**

Significance:

- o **Vital strategic asset:**
  - The US has a vested interest in the secure, efficient, and reliable operation of the canal, as **~72% of transiting ships are either going to or coming from U.S. ports**.
  - For the US, the canal's strategic significance **encompasses national security, defense capabilities, diplomatic relations, and logistical resilience**.
- o **Shorter transit routes:**
  - It saves approx. 12,600 km in a trip between New York and San Francisco.
  - Thus**, enabling ships to avoid the lengthy and hazardous voyage around Cape Horn at the southern tip of South America**.
- o **Environmental benefits:** By providing a shortcut, the canal contributes to the reduction of carbon emission and helps mitigate the environmental impact of global maritime transportation.
- o **Global supply chain:** The Canal connects 180 maritime routes that reach 1,920 ports in 170 countries, and about 5% of global maritime trade transits through it.

The Panama Canal System's Operation:

- The Panama Canal is not a simple channel of water connecting two larger water bodies.
- This is because the elevation of the **Pacific Ocean is slightly higher than the Atlantic**.
- This difference means that for a ship entering the canal through the Atlantic, it needs to gain elevation during its journey to the Pacific.
- Hence, **the canal works on a highly-engineered system,** which uses a system of locks and elevators to lift and drop vessels to the required sea level at either end of the canal.
- **The locks** are either flooded (to gain elevation) or drained (to lose elevation), and act as water elevators. **These locks are serviced using artificial lakes and channels**.
- Most of this water is supplied from **Lake Gatun** (the artificial reservoir key to the Panama Canal system's operation) using the force of gravity (no pumps are needed).

Potential Dangers the Panama Canal Faces from Climate Change:

- **The Panama Canal needs massive amounts of fresh water** to facilitate the passage of ships. **For instance**, the passage of a single ship needs more than 50 million gallons (almost 200 million litres) of water.
- While over 36 ships pass through the canal each day on average (Dec 2023), **traffic has dropped to as low as 22 ships a day now** (that too with a reduced cargo).
- **A drought driven by the El Niño** meteorological phenomenon has reduced water in the Lake Gatun, causing lengthy and costly disruptions to international trade and supply chains.
- Historically, there has been a rainfall shortage on average once every 20 years due to major **El Niño events**.
- However, the year 2023 is the 3rd major rainfall deficit (in the last 26 years) and this permanent problem stems from a larger issue of **climate change,** which threatens humanity.

What Can Be Done to Restore the Panama Canal's Significance?

- **Using ocean water to work the system of locks:** However, this will increase the salinity of Lake Gatun, which is also the source of drinking water for more than half of Panama's 4.4 million people.
- **Creating a second source of water for the canal**: Recently, Panama's Supreme Court ordered to build a $1.6 billion dam across Rio Indio, which will fix the problem for the next 50 years.
  - However, the reservoir of the dam will flood the homes of people, predominantly from the lower socio-economic strata.
  - They will have to be relocated, and will lose lands and livelihoods that they have had for decades.

8. Japan Issues its First-Ever 'Megaquake Warning'

Why in News?

- A recent earthquake (of magnitude 7.1 on Richter scale) in southern Japan was promptly followed by a major warning from Japan's meteorological agency, stating that there was a heightened risk of a first-ever "mega earthquake".
- Earthquakes with a **magnitude greater than 8** (on Richter scale) are classified as megaquakes.

What Concerns are Japanese Authorities Currently Facing?

- **Japan is situated on the Ring of Fire:**
  - Though Japan is **no stranger to seismic activity** (experiencing approx. 1,500 earthquakes annually), most of these tremors cause minimal damage.
  - However, **there have been devastating exceptions**, such as the magnitude 9.0 quake that struck in 2011, triggering a tsunami and nuclear disaster that claimed over 18,000 lives along the north-east coast.
- **The Nankai Trough:**
  - The Nankai Trough, situated off the southwest Pacific coast of Japan, is a significant geological feature that extends for roughly 800-900 km.
  - This **trough is formed by the subduction of the Philippine Sea Plate beneath the Eurasian Plate**.
  - The convergence of these two tectonic plates along the Nankai Trough results in the **accumulation of immense tectonic strains over time**.
  - These built-up strains have the potential to trigger a devastating megaquake approximately once every 100 to 150 years.
  - **For example,** a rupture spanning the entire 600km length of the Nankai Trough triggered Japan's 2nd-largest recorded earthquake (followed by the eruption of Mount Fuji) in 1707.
  - According to experts, there is **a 70% to 80% probability** of a magnitude 8 or 9 earthquake occurring somewhere along the trough within the next three decades.

Why was Alert Issued if Earthquakes can't be Predicted?

- According to experts, the issuance of the warning has almost nothing to do with science.
- This is because earthquakes are known to be a "**clustered phenomenon**", and it is not possible to tell in advance whether a quake is a foreshock or an aftershock.

- However, the alert was sent out urging individuals **to be ready for potential evacuation.** For example, in several towns authorities are encouraging elderly residents and others to voluntarily relocate to safer areas.

What is the Ring of Fire?

- **The Ring of Fire is a tectonic belt of volcanoes and earthquakes**, which is about 40,000 km long and up to about 500 km wide.
- It surrounds most of the **Pacific Ocean,** hence it is also called **Circum-Pacific Belt.**
- It contains between 750 and 915 active or dormant volcanoes, which is **around two-thirds** of the world total.
- **About 90% of the world's earthquakes**, including most of its largest, occur within the belt.
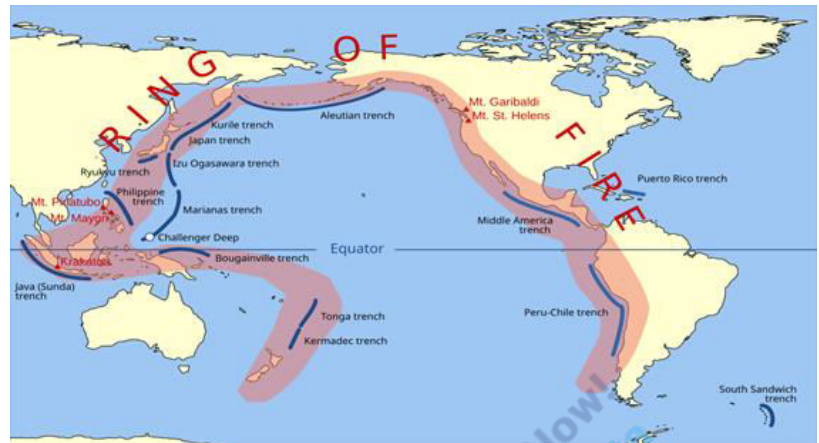
Why Himalayan Towns Need a Different Kind of Development
Background:
- The Indian Himalayan Region is spread across **13 Indian States/Union Territories** (namely Jammu and Kashmir, Ladakh, Uttarakhand, Himachal Pradesh, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura, Assam and West Bengal), stretching **across 2500 km**.
- Nearly 50 million people reside in this region, which is characterized by a diverse demographic, and versatile economic, environmental, social and political systems.
- Towns have expanded, and more urban settlements are developing.
- However, Himalayan towns require a different definition of urbanisation.

Challenges in Himalayan Towns:
- Himalayan towns, including key state capitals, face significant civic management challenges.
- For instance, cities such as **Srinagar, Guwahati, Shillong, and Shimla, along with smaller towns, are grappling with issues related to sanitation, solid and liquid waste management, and water supply.**
- The root cause lies in the reliance on planning models designed for plains, which are ill-suited for the unique geographical and environmental conditions of the Himalayas.
- Additionally, city governments are severely understaffed, operating at just 25% of their required human resource capacity.
- For example, in the Kashmir Valley, excluding the Srinagar Municipal Corporation, there are only 15 executive officers managing over 40 urban local bodies.

Uncontrolled Urban Expansion:
- Urban expansion into peripheral areas is a growing concern. **Cities like Srinagar and Guwahati are encroaching on village commons, leading to the depletion of open spaces, forest lands, and watersheds.**
- In Srinagar, from 2000 to 2020, there was a 75.58% increase in built-up real estate, while water bodies shrank by nearly 25%.
- Moreover, almost 90% of liquid waste in these areas is discharged into water bodies without any treatment, exacerbating environmental degradation.

Underlying Causes:
- The Indian Himalayan Region (IHR) is under immense pressure from rapid urbanisation and development, compounded by **high-intensity tourism, unsustainable infrastructure practices, and irresponsible resource use, particularly land and water.**

- These issues are further aggravated by climate change impacts such as changing precipitation patterns and rising temperatures, leading to **water scarcity, deforestation, land degradation, biodiversity loss, and increased pollution, including plastic waste.**
- These pressures threaten to disrupt the socio-ecological fabric of the Himalayas, with potentially devastating consequences for local communities and ecosystems.
- Tourism in the IHR has expanded significantly, with an average annual growth rate of 7.9% from 2013 to 2023.
- However, this growth has often resulted in the replacement of eco-friendly infrastructure with inappropriate and unsafe constructions, poorly designed roads, and inadequate waste management systems.
- This **has led to the depletion of natural resources, damaging biodiversity** and essential ecosystem services.
- For long-term sustainability, a **shift towards ecotourism**, which prioritises environmentally friendly practices, is urgently needed.

Strategic Recommendations:
- **Mapping and Vulnerability Assessment:**
  o **Planning institutions in IHR cities must shift from traditional land-use principles to more comprehensive approaches** that incorporate geological and hydrological vulnerabilities.
  o Every town should be mapped to identify these risks, and planning processes should involve local communities in a bottom-up approach.
- **Climate-Resilient Urban Design:**
  o Consultant-driven urban planning, which often fails to address the unique challenges of **Himalayan towns, should be replaced with urban designs focused on climate resilience.**
- **Urban Financing for IHR:**
  o None of the cities in the IHR have the **financial capacity to support their infrastructure needs**.
  o The Finance Commission should include a separate chapter on urban financing for the IHR, recognising the high costs of urban services and the absence of industrial corridors.
  o Current intergovernmental transfers from the central government to urban local bodies account for only 0.5% of GDP; this should be increased to at least 1%.
- **Focus on Sustainability:**
  o Himalayan towns must engage in broader discussions about sustainability, with a focus on creating urban futures through robust, eco-centric planning processes that actively involve public participation.

9. A Crime Against Women: Why Accusations of Witchcraft Persist in India

Context
- **In July 2021, the UN Human Rights Council adopted a resolution** aimed at eliminating harmful practices related to accusations of witchcraft and ritual attacks (HPAWR).
- **This resolution brought attention to a global issue,** with data compiled by the UN documenting **20,000 cases of HPAWR between 2009 and 2019 in 60 countries.**
- **The data highlights the presence of HPAWR in regions such as the USA, Europe, and India,** challenging the perception that this is solely an African issue.

The Scope of Witchcraft-Related Crimes in India
- India has its own history and ongoing issues with witchcraft-related violence.
- **The National Crime Records Bureau (NCRB), a standard source of crime data in India since 1953,** categorises **motives for murder, which includes witchcraft.**
- **In 2022, there were 85 documented murders with witchcraft as the motive**, primarily in the states of Chhattisgarh, MP, Jharkhand, and Odisha, with additional cases in Assam, Bihar, and Telangana.
- Although there has been a slight decline in numbers, **the annual count still hovers around 100 murders.**
- **This figure only represents the murders explicitly motivated by witchcraft**, indicating a broader, possibly underreported problem.

Perception and Gender Dynamics in Witchcraft Accusations

- The term **witch is etymologically gender-neutral, yet societal perceptions often differ.**
- While **wizard (wicca) is commonly associated with males, witch tends to be female.**
- According to author Ipsita Roy Chakraverti, although **witchcraft can be sometimes perceived as good**, in reality **it is primarily recognized as evil.**
- This **negative perception is frequently used to justify crimes against women**, not always leading to murder but often resulting in severe social and physical harm.
- **Ignorance and lack of education contribute to these accusations**, with mental health issues or disease outbreaks sometimes leading to individuals being labelled as witches.
- More **sinister motives include targeting widowed or single women for their property**, as well as childless women and educated young women who threaten local vested interests.

Legislative Measures and their Efficacy: Overview of State-Specific Legislation
- **Prevention of Witch (Daain) Practices Act (1993) in Bihar**
  - One of the earliest pieces of legislation aimed at addressing the problem of witch-hunting in India.
  - This **law was enacted to curb the atrocities committed against women accused of being witches.**
- **Prevention of Witch (Daain) Practices Act (2001) in Jharkhand:** This law was introduced to protect women from being branded as witches and subjected to violence and social ostracism.
- **Tonahi Pratadna Nivaran Act (2005) in Chhattisgarh:** This **act specifically targets the practice of witch-hunting** and aims to provide justice to the victims.
- **Prevention of Witch Hunting Act (2013) in Odisha:** This comprehensive law seeks to prevent witch-hunting and provide protection and rehabilitation to the victims.
- **Prevention and Eradication of Human Sacrifice and other Inhuman, Evil and Aghori Practices and Black Magic Act (2013) in Maharashtra:** This law not only addresses witch-hunting but also covers other inhuman practices like human sacrifice and black magic.
- **Prevention and Eradication of Inhuman Evil Practices and Black Magic Act (2017) in Karnataka**: Similar to Maharashtra's law, this act targets a broader range of harmful practices, including witch-hunting.
- **Prevention of Witch Hunting Act (2015) in Rajasthan:** This act aims to protect individuals from being branded and persecuted as witches.
- **Witch Hunting (Prohibition, Prevention and Protection) Act (2015) in Assam:** This legislation focuses on preventing witch-hunting and providing protection and rehabilitation to the victims.

Challenges in Implementation
- **Low Rates of Prosecution and Conviction**
  - One of the major issues with these laws is the **low rate of prosecution and conviction.**
  - **Many cases of witch-hunting do not result in legal action,** and when they do, the conviction rates are often low.
  - This is **due to various factors, including insufficient evidence, lack of witnesses,** and societal pressures.
- **Lenient Penalties**
  - In some states, the **penalties for witch-hunting are not stringent** enough to act as a deterrent.
  - For instance, **in Jharkhand, the penalties under the 2001 Act are criticised for being too lenient** and this undermines the law's effectiveness in preventing such crimes.
- **Ambiguous Legislative Intent**
  - The **intent and scope of some of these laws are not always clear.** For example, **Odisha's law penalises both witch-hunting and the practice of witchcraft.**
  - This **dual focus can create confusion** and may even lead to the persecution of individuals who practice witchcraft as part of their cultural or religious beliefs.
  - Similarly, **Assam and Rajasthan's laws also punish alleged witches**, which can be counterproductive and further victimise those accused.
- **Broad and Generalised Provisions**
  - Many state laws are broad and generalised, **often resembling holdalls with various provisions lumped together.**
  - This **lack of specificity can make it challenging to enforce the laws** effectively and consistently.

- o For example, **Maharashtra's law targets black magic in general, which includes witch-hunting** but also covers a wide range of other practices.
- **Inadequate Police and Judicial Reforms**
  - o **Legislation alone is not sufficient if the police and judicial systems are not reformed** to handle such cases efficiently.
  - o The **lack of specialised training for police officers and judicial personnel in dealing with witch-hunting cases results in poor investigation** and prosecution.
  - o Additionally, the slow pace of the criminal justice system further exacerbates the problem.

Recommendations for Improvement in Addressing the Issue of Implementation
- **Refinement of NCRB Reporting**
  - o The **NCRB should refine its reporting system to include separate categories for witch-hunting** and witchcraft-related crimes.
  - o This will help in accurately assessing the extent of the problem and formulating targeted interventions.
- **Specific Sections in the IPC**
  - o The **Indian Penal Code (IPC) and its modern replacements should include specific sections addressing witch-hunting** and related crimes.
  - o Clear and distinct provisions will aid in better enforcement and prosecution of such cases.
- **Increased Penalties and Stringent Enforcement**
  - o **Penalties for witch-hunting should be increased** to act as a stronger deterrent.
  - o Additionally, there should be stringent enforcement of these laws, with a focus on ensuring that perpetrators are prosecuted and convicted.
- **Clarity of Legislative Intent**
  - o **Laws should clearly distinguish between the practice of witchcraft and the crime of witch-hunting.**
  - o Penalising the practice of witchcraft can lead to further victimisation and should be avoided.
  - o Instead, the **focus should be on preventing and punishing acts of violence and persecution.**
- **Awareness and Training Programs**
  - o **Comprehensive awareness campaigns** and training programs for police officers, judicial personnel, and the public **are essential.**
  - o **These programs should focus on the legal provisions**, the rights of the victims, and the importance of combating superstitions and harmful practices.

Conclusion
- **While India has made significant strides** in addressing witchcraft-related violence through state-specific legislation, **challenges remain in terms of implementation and enforcement.**
- **To effectively combat this issue, it is essential to refine existing laws, enhance reporting mechanisms, increase penalties**, and focus on awareness and community engagement.
- By taking these steps, **India can ensure better protection for victims and work towards eradicating these harmful practices,** contributing to its progress as a developed nation.

10. How to Reduce Landslide Risks

Why in News?

Massive landslides hit the district of **Wayanad in northern Kerala**, triggering large-scale death (toll stands at 215) and destruction and the number of missing people indicate that the real toll will be higher.

Possible Causes of Landslide in Wayanad:
- **Natural:**
  - o According to the Geological Survey of India (GSI), almost half of Kerala's land area is prone to landslides.
  - o **The heavy rainfall in the region and the slope of the Western Ghats** mean that 31.54% of the Wayanad district is highly susceptible to landslides.
- **Anthropogenic:**
  - o **Increasing construction activities:**

- The Wayanad region has become a **tourist hotspot**, with homestays and monsoon tourism being the latest trends.
- **The construction of resorts, artificial lakes and quarrying activities** in the eco-sensitive zones (ESZ) have exacerbated the danger of a landslide.
  - o **Changes in crop patterns:**
    - Land use changes have occurred starting with the **British-era tea plantations**.
    - In Wayanad, there has been a 62% reduction in forest cover between 1950 and 2018, coupled with a 1,800% increase in the area under plantation.
    - Such **monocropping** leads to a **loosening of the topsoil** that was once held in place by the roots of a forest.
  - o **Climate change:**
    - Climate change has played an indirect role, **leading to changes in rainfall patterns in the State**.
    - **The warming of the Arabian Sea** is allowing the formation of deep cloud systems, leading to extremely heavy rainfall over a shorter period. Heavy rainfalls cause run-offs that can lead to landslides.
  - o **Issues with landslide warnings:**
    - **The IMD** issues warnings for heavy rainfall (in a colour-coded system) and the week before the landslides, the alert was largely yellow, which does not call for action.
    - **The GSI** has been designated the nodal agency for landslide studies, and has been given the responsibility of evolving an early warning system and protocols for landslide risk reduction.
    - However, **this is still in the experimental stage** and will take four or five more years to be ready for public use, a senior GSI official said.

Landslides Prevention Techniques/ Measures:
- **Banning/ regulating construction activities in ESZ:** For example, the Gadgil panel report of 2011 recommended that the entire region of the Western Ghats, spanning 1,29,000 square km across six States, be declared an ESZ.
- **Upgrading institutional capacities and coordination:** For example, IMD must use new technologies for accurate weather predictions.
- **Engineering solutions:**
  - o **Slope stabilisation:** It involves adding structural elements to the slope to increase its stability.
  - o **Grading and terracing:** It involves modifying the slope's shape and gradient to reduce the risk of landslides.
  - o **Soil reinforcement:** It involves adding materials to the slope to increase its strength and stability.
- **Natural solutions:**
  - o **Vegetation control:** Planting trees, shrubs, or grasses can help stabilise the soil, absorb excess water, and reduce erosion.
  - o **Mulching:** Mulch is a layer of organic or inorganic material applied to the soil surface. It helps retain moisture, prevent erosion, and stabilise the slope.
  - o **Bioengineering techniques:** They combine the use of plants and engineering principles to stabilise slopes.
  - o **Water management:** It slows down the flow of water, allowing it to infiltrate the soil gradually.
- **Early warning systems and monitoring for landslides:** They provide timely information and alerts, allowing individuals and communities to take necessary actions to mitigate the impacts of landslides.
- **Emergency preparedness for landslides:** Despite preventive measures, landslides can still occur. Being prepared and knowing how to respond during a landslide event is crucial for minimising the risks.

General Studies II

1. Moving the Spotlight to Grassroots Democracy

Context
- The **Election Commission of India (ECI) is lauded as one of the most credible institutions in independent India** due to its consistent record of conducting free, fair, and timely elections to the Parliament and State legislatures.
- However, **the focus on the ECI often overshadows the critical role of State Election Commissions (SECs),** which are equally vital to the democratic framework, especially at the grassroots level.
- Unfortunately, **these 34 SECs across the country require urgent attention and strengthening** to fulfil their constitutional mandate effectively.

The Systemic Disempowerment of State Election Commissions (SECs)
- **A Significant Challenge**
  - The systemic disempowerment of SECs **represents a significant challenge to the effective functioning of India's democratic system**, particularly at the grassroots level.
  - SECs were **established under Articles 243K and 243ZA of the Constitution**, introduced **through the 73rd and 74th Constitutional Amendments in 1993.**
  - These **amendments were pivotal in decentralising governance, granting local bodies the autonomy to govern effectively** and bringing democracy closer to the people.
  - **SECs were vested with the critical responsibility** of overseeing the preparation of electoral rolls and the **conduct of elections to panchayats and urban local governments (ULGs).**
  - However, **despite the constitutional mandate, the reality has been starkly different,** with SECs increasingly finding themselves powerless and undermined by state governments.
- **Legal and Institutional Constraints**
  - One of the most glaring manifestations of this disempowerment is the **frequent legal and institutional conflicts between SECs and state governments.**
  - These **conflicts often stem from the reluctance of state governments to relinquish control over local elections,** thereby undermining the autonomy of SECs.
  - For instance, **in Karnataka, the SEC was compelled to file a contempt petition against the state government** for failing to comply with a High Court order.
  - The **court had directed the Karnataka government to proceed with the delimitation of panchayat raj institutions** and conduct overdue elections.
  - The **elections had already been delayed by over three and a half years,** significantly undermining local governance.
  - **Despite a commitment to publish the delimitation and reservation details within two weeks, the state government defaulted on its promise**, prompting the SEC to seek judicial intervention.

Impact of Disempowerment of SECs
- **Weakened Local Governance**
  - When SECs are unable to conduct timely and fair elections, **the entire system of local governance is weakened.**
  - **Local governments**, which are supposed to be the closest to the people and most responsive to their needs, **find themselves paralysed** due to the absence of elected representatives.
  - **This not only undermines the principles of democracy but also leads to a governance vacuum** at the local level.
  - The **performance audits conducted by the Comptroller and Auditor General (CAG) of India provide a stark illustration of this problem.**
  - **According to the CAG's audits** of the implementation of the 74th Constitutional Amendment across 18 states, a **staggering 70% of urban local governments did not have elected councils at the time of the audit.**
  - This was **largely attributed to delays in conducting elections**, which in turn were often caused by the disempowerment of SECs.
- **Erosion of Public Trust**

- When elections are delayed or conducted under questionable circumstances, **citizens lose confidence in the electoral process** and, by extension, in the institutions that are supposed to represent them.
- **This erosion of trust is particularly damaging in a democracy,** where the legitimacy of government institutions rests on the consent of the governed, expressed through free and fair elections.
- The **Annual Survey of India's City Systems (ASICS) conducted by Janaagraha in 2023 highlights the uneven empowerment of SECs** across the country.
- The **survey found that only 11 out of 34 states and UTs had empowered their SECs to conduct ward delimitation**, a critical function for ensuring fair and representative elections.
- **These states and UTs account for only 35% of India's population,** according to the 2011 Census.
- This **statistic underscores the widespread nature of the problem**: in most states, SECs lack the necessary powers to carry out their constitutional mandate effectively.

The Need for Electoral Reforms
- To address these issues, **comprehensive electoral reforms are essential** to strengthen the third tier of India's democracy; local governments.
- **Regular and fair elections at this level are crucial** for meaningful grassroots democracy and effective service delivery.
- The **constitutional mandate for local government elections to be held before the expiry of their five-year term** must be upheld with the same sanctity as elections to the Lok Sabha and State Assemblies.
- The **Supreme Court recognised this in the 2006 case of Kishan Singh Tomar vs Municipal Corporation of the City of Ahmedabad**, emphasising **the need for SECs to have equivalent powers to conduct local elections.**

Necessary Reforms to Empower SECs in Interest of Grassroot Level Democracy
- **Empowerment and Independence of SECs**
  - SECs **must be brought on par with the ECI in terms of transparency and independence.**
  - **Currently, state governments appoint SECs, leading to potential conflicts of interest** and reduced autonomy.
  - A **more robust system would involve a three-member SEC** appointed by a **committee consisting of the Chief Minister, Leader of Opposition in the Legislative Assembly, and the Chief Justice of the High Court.**
  - This would enhance the independence and credibility of SECs.
- **Fixed Delimitation Intervals**
  - The **delimitation of ward boundaries and reservations of seats should occur at fixed intervals**, such as every 10 years.
  - This **would prevent arbitrary actions by state governments** that can lead to undue delays in local elections.
  - A **standardised process would ensure fairness and consistency** in the electoral process.
- **Vesting Powers in SECs**
  - The **powers of ward delimitation and reservation of seats should be vested exclusively in the SECs.**
  - Additionally, **SECs should be responsible for determining the reservations for the positions of mayors, presidents, and deputy mayors** of local governments.
  - Currently, delays in publishing reservation rosters by state governments cause significant delays in elections to these positions, which undermines the democratic process.
- **Addressing Malpractices**
  - **Malpractices by presiding officers appointed by state governments have been reported,** as seen in the 2024 election of the Mayor in the Chandigarh Municipal Corporation Council.
  - To prevent such issues, **SECs should be entrusted with the responsibility of conducting elections for mayors, presidents, chairpersons, and standing committees**, ensuring that these processes are free from undue influence.

Conclusion
- **The challenges faced by SECs are symptomatic of a broader issue within India's democratic framework**, where the decentralization intended by the 73rd and 74th Constitutional Amendments has not fully materialized.
- **Strengthening SECs** is not just a matter of administrative reform; **it is essential for preserving the integrity of India's democracy at the grassroots level.**

- **Empowering SECs with greater autonomy, transparency, and the necessary authority will ensure that local governments can function effectively**, thereby enhancing citizen trust in these vital institutions.

2. Controversy Over Lateral Entry into the Civil Services

Background:
- Recently, the **Union Public Service Commission (UPSC) withdrew an advertisement for lateral recruitment to 45 government posts.**
- This decision followed objections raised by political parties and the intervention of the Prime Minister's Office (PMO), highlighting concerns about the need for reservation in such recruitments.

Understanding Merit vs. Spoils System:
- **Merit System:**
  o **Introduced in 1858**, this system ensures appointments to government posts through a rigorous selection process.
  o In India, the UPSC conducts exams to select officers for the Indian Administrative Service (IAS), Indian Police Service (IPS), and other central services.
  o The **aim is to create a neutral bureaucracy** that can provide independent advice to the government.
- **Spoils System:**
  o Originating in the U.S., this system allows the ruling party to appoint its supporters to various government positions.
  o While this system was largely replaced by the merit system in 1883, it still exists in a limited form, with a **small percentage of senior government posts directly appointed by the President**.

About Lateral Entry in Civil Services:
- Lateral entry in administration is the **appointment of specialists from the private sector in government organisations.**
- It was recommended by the NITI Aayog in its Three-year Action Agenda and also the Group of Secretaries (GoS) on Governance had in its report recommended the induction of personnel in the middle and senior management level in the government.
- **Objective**:
  o **Lateral entry was introduced to serve the twin purpose of:**
    ▪ Bringing in **domain expertise** in the civil services,
    ▪ Addressing the problem of **shortage of IAS officers** at the Centre.
  - With lateral entry, the **government aims to recruit outstanding individuals, with expertise in revenue, financial services, economic affairs, agriculture, cooperation and farmers' welfare**, road transport and highway, civil aviation, commerce among many other sectors to serve for the benefit of the country.

Process of Lateral Entry Recruitment:
- The selection process for lateral entry into administration is conducted by the **Union Public Service Commission (UPSC)**.
- **The Department of Personnel and Training (DoPT) asks the UPSC to conduct the selection process for lateral entry to various positions in government departments and ministries.**
- Subsequently, the UPSC invites online applications for lateral recruitment for these positions.
- Once the candidates have submitted their application, the UPSC conducts interviews of the shortlisted candidates and recommends the list of selected candidates to the DoPT.
- The recommended candidates are then appointed by the Government, **generally for a period of 3 to 5 years**.

Need for Lateral Entry:
- **Shortage of officers:**
  o There is a **shortage of 22.48% or 1,510 officers for the IAS cadre, according to the DoPT.**
  o The IAS and the Indian Police Service (IPS) have a combined shortage of 2,418 officers.

- **Domain Expertise:**
  - Through lateral entry, domain experts can be recruited from the private sector to the central administration.
  - This can be helpful in improving efficiency and create a competitive environment in governance delivery.

Pros of Lateral Entry in Civil Services:
- **Expertise and Specialization:** Lateral entry allows professionals with specialized knowledge and experience from the private sector to contribute to policymaking and implementation, enhancing the quality of governance.
- **Innovation and Fresh Perspectives:** Individuals from diverse backgrounds bring new ideas, innovative approaches, and fresh perspectives, potentially improving efficiency and effectiveness in public administration.
- **Merit-Based Selection:** Lateral entry emphasizes merit, skills, and experience over traditional seniority, promoting a performance-oriented culture within the civil services.
- **Shortening Learning Curve:** Experienced professionals can quickly adapt and contribute without requiring extensive training, which is often needed for career bureaucrats.

Cons of Lateral Entry in Civil Services:
- **Cultural and Bureaucratic Resistance:** The traditional civil services may resist the inclusion of lateral entrants, potentially leading to friction, lack of cooperation, and integration challenges.
- **Lack of Public Sector Experience:** Lateral entrants may lack understanding of government procedures, protocols, and the complexities of public administration, affecting their effectiveness.
- **Potential for Bias:** The selection process for lateral entry could be perceived as biased or politically influenced, raising concerns about transparency and fairness.
- **Short-Term Focus:** Professionals entering laterally may focus on short-term goals rather than long-term public service commitments, potentially affecting the continuity and sustainability of policies.

Way Forward:
- To address the concerns associated with lateral entry, certain measures can be taken:
  - **Higher Scrutiny:** Appointments at the secretary level should be carefully monitored to ensure they influence policy decisions positively.
  - **Integration with Public Policy:** Even at operational levels like Joint Secretary, Director, and Deputy Secretary, lateral entrants should be in line with public policy objectives.
  - **Balancing Merit with Social Justice:** Appointments should combine technical competence with considerations for reservation and social justice, as emphasized by political philosopher Michael Sandel.

Larger Issues in Indian Bureaucracy:
- **Challenges for Career Bureaucrats:** Despite criticisms of **red-tapism** and **inefficiency**, career bureaucrats operate in a complex environment bound by numerous rules and political interference.
- **Preserving Autonomy:** The effectiveness of bureaucrats depends on their autonomy, particularly regarding postings, tenures, and transfers. **Strengthening Civil Service Boards at the Centre and State levels**, as recommended by the Supreme Court in the T.S.R. Subramanian case (2013), is crucial.

Conclusion:
- While lateral entry brings certain benefits, it should not overshadow the need to address deeper issues within the Indian bureaucracy.
- A balanced approach that includes both career bureaucrats and lateral entrants, with a focus on merit, social justice, and autonomy, is essential for effective governance.

3. Child Adoption in India

Background:
- Of **the 18,179 adoptions recorded since 2019, only 1,404 involved children with special needs even as the absolute numbers of adoptions saw an increase over the next five years, according to official data.**

- Though the number of children with special needs for adoption has risen, the adoption rate is still significantly low, activists pointed out.

What is Adoption in legal terms?
- Adoption is the formal process through which a child is permanently separated from his biological parents to become the lawful child of his adoptive parents.
- The adopted child enjoys all rights, privileges and responsibilities attached to a biological child.

Legal Provisions w.r.t Adoption in India:
- **In India, two legislations deal with the adoption of a child:**
  - The **Hindu Adoption and Maintenance Act, 1956** (HAMA)
  - The **Juvenile Justice (Care and Protection of Children) Act, 2015**
    - This includes Juvenile Justice (Care and Protection of Children) Model Rules, 2016 and Adoption Regulations, 2017.
  - **The fundamental principles that govern adoption state that –**
    - Interests of the child are most important and
    - Preference is to be given to place the child in adoption with Indian citizens with "due regard to the principle of placement of the child in his socio-cultural environment, as far as possible".
  - **CARA functions as the nodal agency for adoption in India.**
  - A database of children and registration of prospective parents is done on a centralised Child Adoption Resource Information and Guidance System (**CARINGS**), which is maintained by CARA.

About Central Adoption Resource Authority (CARA):
- CARA is a **statutory body established under the Juvenile Justice (Care and Protection of Children) Act, 2015.**
- CARA functions as the nodal body for adoption of Indian children and is mandated to monitor and regulate in-country and inter-country adoptions.
- It primarily deals with **adoption of orphan, abandoned and surrendered children through its associated/recognised adoption agencies.**
- CARA is designated as the Central Authority to deal with inter-country adoptions in accordance with the provisions of the **Hague Convention on Inter-country Adoption, 1993**.

Who can be Adopted?
- An orphan, abandoned, or surrendered child who has been declared legally free for adoption by the Child Welfare Committee (CWC) can be adopted.
  - This only **happens under the provisions of the JJ Act 2015.**
- A child of a relative — paternal uncle or aunt, a maternal uncle or aunt or paternal and maternal grandparents — can be adopted.
- According to CARA, children of the spouse from earlier marriage surrendered by the biological parent(s) can also be adopted by the step-parent.

Who can Adopt?
- The Ministry of Woman and Child Development states that irrespective of marital status and whether or not they have a biological son or daughter, a person can adopt if:
  - The **prospective adoptive parent (PAP) is physically, mentally stable, financially capable** and should not have any life-threatening medical condition,
  - In the **case of a married couple, two years of stable marital relationship and consent of both spouses are required for adoption.**
  - While a single woman can adopt a child of any gender, a single male is not eligible to adopt a girl child.
  - The **minimum age difference between the child and either of the prospective adoptive parents should not be less than 25 years.**
  - Couples with three or more children are not considered except in the case of adoption of children with special needs or hard-to-place children.

Reasons Behind Low Level Adoption in India:
- India has a significant number of orphaned and abandoned children living in Child Care Institutions (CCIs), yet the adoption rates remain low.
- Despite over 28,000 prospective parents registered with the CARA, only about 2,200 children are legally available for adoption. This discrepancy is due to several factors.
- **Lengthy and Exhausting Process:**
  - Many prospective parents face years of waiting with no assurance of when they will be able to adopt.
  - The process is emotionally draining, with little communication from CARA, leading to frustration and disappointment.
- **Systemic Delays:**
  - The journey from finding an orphaned child to placing them in an adoptive home involves multiple steps, including legal formalities that can take years to complete.
  - Even after being identified, many children in CCIs do not make it to the adoption pool due to incomplete paperwork or other procedural delays.
- **Social and Cultural Barriers:**
  - Historically, **Indian society has been resistant to adoption due to social issues like caste, class, and genetics.**
  - However, the growing number of prospective adoptive parents indicates a shift in societal attitudes, with more people now embracing adoption as a way to build a family.
- **Special Needs and Older Children:**
  - A significant challenge is the adoption of older children, siblings, and those with disabilities.
  - These categories often remain unadopted in India, although foreign adoptive parents are more open to adopting children with special needs.

Conclusion:
- While there is an increasing awareness and acceptance of adoption in India, the process remains fraught with delays and systemic issues that need urgent reforms.
- Ensuring timely legal procedures, better communication, and a more inclusive approach to adoption can help address these challenges and provide homes for many more children.

4. PM Modi's Visit to Ukraine

Why in news?
PM Modi met Ukrainian **President Volodymyr Zelenskyy in Kyiv**, marking a significant diplomatic milestone amidst the Russia-Ukraine war.
It was the first-ever visit to Ukraine by an Indian prime minister after Ukraine became independent in 1991.

India – Ukraine Bilateral Relation
- **Political Relation**
  - **India recognized Ukraine as a sovereign country in December 1991** and established diplomatic relations in January 1992.
  - The **Embassy of India in Kyiv was opened in May 1992.**
  - India and Ukraine enjoy warm and friendly relations and cooperate in areas like Education, Mutual Legal Assistance and Outer Space cooperation.
- **Economic relation**
  - In the first half of 2024 the volume of bilateral trade amounted to 1.07 billion USD. Export of goods from Ukraine – 0.41 billion USD, import of goods from India – 0.66 billion USD.
    - The **negative trade balance for Ukraine amounted to 0.25 billion USD.**
    - The top commodities exported from Ukraine to India were fats and oils of vegetable origin, maize, hard coal, anthracite.
    - Main Indian commodities imported to Ukraine were pharmaceutical products, mineral fuels, petroleum and distillation products, flat-rolled steel, electrical machinery.
- **Defence Relation**

- o Ukraine has been a source of military technology and equipment for India since its independence.
- o Ukraine manufactures the R-27 air-to-air missiles which are in use by the IAF on its SU-30MKI fighters.
- **Cultural Relation**
  - o There is a great interest in Indian culture in Ukraine at the public level, covering various aspects such as dances, yoga, philosophy, Ayurveda and spirituality.
  - o There were about 18,000 Indian students studying in Ukraine, mainly in the field of medicine.

Key highlights of the visit
- **Reiterated India's support for peace**
  - o PM Modi reiterated India's support for peace, mentioning that **India is not neutral but is in favour of peace**.
  - o He highlighted India's tradition of non-violence from Buddha and Gandhi.
- **Expressed sorrow over the loss of innocent children in the conflict**
  - o Modi visited the Martyrologist Exposition at the National Museum of History of Ukraine and expressed sorrow over the loss of innocent children in the conflict.
- **India presented four BHISHM Cubes to Ukraine**
  - o PM Modi presented four BHISHM Cubes to Ukraine, which include medical equipment and supplies for emergency treatment and surgery.
  - o **BHISM stands for Bharat Health Initiative for Sahyog Hita & Maitri**. It is a mobile hospital aimed at providing emergency medical care to Ukraine.
  - o Bhishm was initiated under the umbrella of **Project Aarogya Maitri**, a programme to provide crucial medical supplies to developing nations for humanitarian aid.
  - o The **purpose of the initiative is to deliver all basic facilities and equipment for providing emergency medical care in an easy to use and rapidly deployable manner.**
  - o This **mobile hospital** consists of all essential medicines and equipment in cubical boxes that are each of 15 inches, in a well-organised manner.
    - ▪ They are arranged in accordance with the type of medical assistance and injuries that could happen in a war or natural disaster.
  - o These mini cubes are said to be then positioned on a **strong, adjustable, which allows multi-mode transportation -by air, sea, land and drone.**
  - o In addition to this, the cubes can be carried by an individual too as their maximum weight is 20 kg.
  - o As per the officials, one cube can manage about 200 emergency situations of diverse nature including trauma, bleeding, burns, fractures, shock, along with managing initial triage and classification.
  - o They also said that the cubes also provide the ability to support basic surgeries and can generate power and oxygen in limited amounts and duration.
- **Four landmark agreements were reached**
  - o India and Ukraine signed four agreements to provide for cooperation in agriculture, medicine, culture & humanitarian assistance.

Significance of this visit
- PM Modi's visit to Kyiv marks a significant diplomatic shift for India, as it re-engages with Ukraine and asserts itself in the global geopolitical landscape amid the ongoing Russia-Ukraine war. This visit highlights three key developments:
- **India's Role in European Peace Efforts**
  - o Modi's engagement with Ukrainian President demonstrates India's commitment to understanding Ukraine's concerns and contributing to global peace efforts.
  - o This **positions India as a more active participant in resolving the conflict, especially in the Global South**.
- **Diplomatic and Strategic Space**
  - o Modi's visit signals India's intention to play a more proactive role in shaping global power dynamics, particularly in Europe.
  - o This is contrasted with China's growing influence in the region and the U.S.'s evolving stance on its involvement in European security.
    - ▪ Ukraine is not only about renewed contest between Russia and the West but also about the role of Delhi and Beijing in Europe.

- **Reviving India-Ukraine Relations**
  - Modi's visit also seeks to restore and enhance India's ties with Ukraine, which had been neglected post-Soviet Union.
  - The commitment to a strategic partnership, along with economic, defense, and cultural cooperation, represents a significant renewal of the relationship between the two nations.

5. How to Ensure Dignity for the Terminally-ill

Context
- **A Supreme Court (SC) judgment concerning the withdrawal of a Ryles tube** of a terminally-ill patient **highlights the ongoing legal and ethical confusion surrounding euthanasia** in the country.
- The SC's decision, which denied the removal of the tube, **brings into focus the complexities of passive euthanasia, the interpretation of life-support systems,** and the broader ethical implications of such decisions.
- After SC's decision, **it is important to analyse all aspects, considering the medical, legal, and ethical dimensions of the case.**

The Case of Harish Rana: Petition Before the Court, Legal Confusion and Ethical Dilemmas
- **Petition Before the Court**
  - **Harish Rana, a 32-year-old man, has been in a persistent vegetative state for over 11 years,** with no chance of recovery.
  - His condition, which leaves him **entirely dependent on a Ryles tube for nutrition, has not only devastated his life** but also placed an **immense emotional and psychological burden on his ageing parents.**
  - They **approached the SC seeking permission to remove the Ryles tube**, hoping to allow their son a dignified death after years of what they perceive as futile suffering.
  - This **case serves as a stark illustration of the legal and ethical confusion** surrounding euthanasia in India.
- **Legal Confusion**
  - **The Definition and Scope of Life Support**
    - The **SC's decision to deny the removal of the Ryles tube primarily hinges on the interpretation of what constitutes life support.**
    - The court, led by Chief Justice, **ruled that a Ryles tube is not a life support system,** distinguishing it from other interventions like ventilators or dialysis machines, which are more traditionally recognised as life-sustaining.
    - This **distinction is crucial because, under the SC's 2018 judgment, the withdrawal of life support is permissible in cases where the patient is terminally ill and beyond recovery.**
  - **The Ambiguity Surrounding the Ryles Tube**
    - However, **this interpretation creates a significant legal conundrum**.
    - Clinically-assisted nutrition and hydration, which includes the use of a Ryles tube, is widely recognised in the medical community as a form of life support.
    - The **purpose of a Ryles tube is to sustain life by providing essential nutrition** to a patient who cannot eat by normal means.
    - By **categorising the Ryles tube differently, the court has introduced a grey area** in the legal framework governing end-of-life care.
    - This **ambiguity not only complicates the legal landscape but also poses ethical dilemmas for both healthcare providers and families** facing similar situations.

Ethical Dilemmas: Beneficence, Non-Maleficence, and Autonomy
- **Beneficence**
  - **Beneficence** requires that **any action taken should be in the best interest of the patient.**
  - For Harish Rana, who has no prospect of recovery, **the question arises: Is it truly in his best interest to continue being fed through a Ryles tube,** thereby prolonging a life that lacks any semblance of quality?
  - The **continuous use of the Ryles tube might keep him alive, but it also prolongs a state of existence** that many would argue is devoid of dignity and purpose.

- This **brings into question whether the court's decision truly aligns with the principle of beneficence.**
  - o **Non-maleficence**
    - **Non-maleficence**, the **obligation to do no harm, is another critical ethical consideration**.
    - While the **intent behind maintaining the Ryles tube might be to avoid causing death by starvation, it inadvertently causes prolonged suffering.**
    - Living with a Ryles tube involves considerable physical discomfort, including the pain of insertion and the need for regular replacement, which adds to the distress of an already dire situation.
    - **By refusing to allow the removal of the tube, the court may be perpetuating harm,** contrary to the ethical obligation to minimise suffering.
  - o **Autonomy**
    - **Autonomy**, **the right of the patient to make informed decisions about their own care**, is severely compromised in this case.
    - **Since Harish Rana is in a vegetative state and unable to express his wishes, the responsibility falls on his parents,** who sought to act in what they believed to be his best interest.
    - The **court's decision to deny their request effectively overrides their judgment and their son's autonomy,** replacing it with a legal standard that may not fully consider the unique circumstances of the case.

The Role of Cultural Perceptions in the SC's Judgment and Broader Implications of the Judgement
- **The Role of Cultural Perceptions in the SC's Judgment**
  - o The SC's decision **reflects a broader cultural discomfort** with death and dying in India.
  - o **Death, particularly through passive euthanasia, is often seen as a form of murder** rather than a release from prolonged suffering.
  - o This **cultural perception is further complicated by the symbolic significance of feeding**, which is intertwined with caregiving, hospitality, and love in many cultures.
  - o The **denial of food, even in a medically assisted form like a Ryles tube, is taboo** at both a social and existential level.
  - o However, **the reality of living with a Ryles tube is far from compassionate**. **The procedure is painful and requires regular,** distressing changes every few weeks.
  - o **Extending such a life, with no hope for recovery, is a burden not only for the patient but also for their caregivers.**
- **Broader Implications of SC's Judgement**
  - o The **SC's rationale that removing the Ryles tube would result in death by starvation overlooks the profound suffering involved in maintaining a life of such poor quality,** calling into question the ethical foundation of the court's decision.
  - o The **SC's ruling in Harish Rana's case does more than just settle a legal matter**; it sets a precedent that could affect countless others in similar situations.
  - o The **decision to categorise the Ryles tube as separate from other forms of life support may complicate future cases**, where families and medical professionals are left uncertain about the legality of withdrawing certain treatments.

Way Forward
- **The Need for Legal Clarity**
  - o The Harish Rana case **highlights the urgent need for legal clarity regarding the distinction between euthanasia and the withdrawal of futile life-sustaining interventions.**
  - o Involving medical and ethical experts in such decisions is essential to ensure that judgments are based on sound medical understanding and ethical principles.
  - o **Until such legal clarity is achieved, it is crucial to educate the public about their rights** and the options available through mechanisms like Advance Care Planning and Advance Medical Directives.
- **Ethical Reform**
  - o **A good quality of life and death is a fundamental right** that should not be compromised by ethical ambiguities.
  - o Therefore, **the court must investigate the ethical side of the judgement** and must try to reform these principles.

- o **The SC's judgment, while well-intentioned, reveals the need for a more nuanced understanding of euthanasia and life support**, one that respects the dignity and autonomy of the patient while ensuring that medical and ethical standards are upheld.

Conclusion
- **The SC's judgment** in Harish Rana's case serves as a **poignant reminder of the complex legal and ethical landscape surrounding euthanasia in India.**
- The **denial of permission to remove the Ryles tube**, despite the patient's vegetative state and lack of recovery prospects, **underscores the need for greater legal clarity and ethical reform.**
- **As India continues to grapple with these issues, it is imperative to involve medical and ethical experts in decision-making processes** and to ensure that the rights to a dignified life and death are respected for all individuals

6. Steps for Implementing Land Reforms in India

Why in News?
The Centre has decided to provide states with Rs 10,000 crore in incentives for implementing land-related reforms in rural and urban areas, and Rs 5,000 crore for creating a Farmers' Registry during the financial year 2024-25 (FY25). The funds will be provided under the Scheme for Special Assistance to States for Capital Investment 2024-25.

Promises Related to the Land Reforms Made in the Union Budget 2024-2025:
- **Land-related reforms in the rural areas:** These will include -
  - o Assignment of unique land parcel identification numbers (ULPIN) or **Bhu-Aadhaar** for all lands,
  - o Digitisation of cadastral maps,
  - o Survey of map subdivisions as per current ownership,
  - o Establishment of land registry, and
  - o Linking to the farmers registry.
- **Land-related reforms on the urban front:** These will include -
  - o Digitisation of land records with GIS mapping.
  - o Establishing an IT-based system for property record administration, updating, and tax administration.
  - o These will facilitate **improving the financial position of urban local bodies**.
- **Implementation of the Digital Public Infrastructure (DPI) in agriculture:**
  - o The Indian government (in partnership with States) will facilitate the implementation of the DPI in agriculture for coverage of farmers and their lands in 3 years.
  - o This programme will include a "**digital survey**" of the kharif crop in 400 districts and the land details being brought into a "**land registry**".
  - o These actions will facilitate credit flow and other agricultural services to rural land.

Significance of Actions on Reforms around Land:
- It points towards a **recognition that States are the key actors** on these issues, and that **approaches and constraints can vary across States**.
- Overall better land registries and cadastral maps are key -
  - o **To understanding land-use around the country**,
  - o To enforce building codes, and
  - o To evaluate the risks due to various hazards, including **natural disasters.**
- Information about land-use and land-use change are also key to understanding India's **emissions inventory.**

Challenges Towards Implementing Actions on Land Reforms:
- India has been trying to develop such land maps since the 1980s, with limited success.
- One particular pitfall has been **lack of standards**.
  - o These maps have been made by **manual digitisation** and are **not properly georeferenced**, i.e. the digital data is not mapped to fixed geographical coordinates.

- o The States have used **different mapping projections,** so maps prepared by one State's processes are not directly compatible with those of another.
- Thus, it is important to develop GIS data standards and interoperability for various end applications first.
- These efforts also **need technology support and upgrading**, while appropriate and enabling institutional arrangements will need to be worked out at state and city levels.

What is the Scheme for Special Assistance to States for Capital Investment 2024-25?
- In view of a **higher multiplier effect** of capital expenditure and in order to provide a boost to capital spending by States, the scheme was **announced in the Union Budget 2024-25.**
- The scheme (first launched in 2020-21) **provides financial assistance to state governments** in the form of 50-year interest-free loans for capital investment projects.
- In 2024-25, the scheme was redesigned with an overall allocation of ₹1.30 lakh crore, and includes 2 mandatory conditions for the next fiscal year:
- o With many states tweaking the names of centrally sponsored schemes (CCSs), the Centre has made it mandatory that to avail of the capex loan, **states would have to retain the official name of all schemes.**
- o The Centre has now mandated that states have to deposit the central share of interest earned in SNA accounts till March 31 (2024), in the Consolidated Fund of India.
  - ▪ **The single nodal agencies (SNA) model** requires states to notify an SNA for each CSS to receive funds from both the Centre and from state budgets.

7. Australia, U.S., U.K. sign nuclear transfer deal for AUKUS submarines

Why in news?
Australia has signed a deal with the United States and Britain to exchange nuclear secrets and materials, advancing its plan to equip its navy with **nuclear-powered submarines** as part of the 2021 AUKUS security accord.
This agreement binds the three countries to secure arrangements for transferring sensitive nuclear material and know-how.

AUKUS partnership
- **About**
- o Signed in September 2021, the new enhanced trilateral security partnership for Indo-Pacific between **Australia, the United Kingdom, and the United State**s is named as **"AUKUS"**.
- o The **first major initiative** of AUKUS would be to deliver a nuclear-powered submarine fleet for Australia.
- o These countries, however, made it clear that their **aim is not to arm the new submarines with nuclear weapons**.
- o This is because Australia is a signatory to the Nuclear Non-proliferation Treaty (NPT) which bans it from acquiring or deploying nuclear weapons.
- **Key highlights of the deal**
- o The United States intends to sell Australia three US Virginia class nuclear-powered submarines, in the early 2030s, with an option for Australia to buy two more if needed.
- o The multi-stage project would culminate with British and Australian production and operation of a **new submarine class – SSN-AUKUS**.
  - ▪ SSN-AUKUS will be a trilaterally developed vessel based on Britain's next-generation design.
  - ▪ It would be built in Britain and Australia and include cutting edge U.S. technologies.

Significance of this deal
- o **For US**
  - ▪ US has only shared nuclear submarine technology once before in 1958 with Great Britain.
- o **For Indo-Pacific Region**
  - ▪ Under this partnership, technology, scientists, industries and defence forces of these three countries will work together to deliver a safer and more secure region.
  - ▪ Some analysts feel that this partnership will lead to intensified arms race in the region**.**

- o **For Australia**
  - Australia has never had nuclear-powered submarines.
  - Hence, this step will give Australia naval heft in the Pacific, where China has been particularly aggressive.
  - Critics, on the other hand, claim that this **deal would antagonise Beijing** which will not be good for Australia.
  - Australia is now set to join **an elite group of only six countries** – India, US, UK, France, Russia and China – that operate nuclear-powered submarines.
  - It will also be the only country to have such submarines without having a civilian nuclear power industry.
- o **For India**
  - The new pact will add to the global efforts to balance China in the region.
  - It should be noted that Australia and India are close strategic partners in the Indo-Pacific region.
  - Australia is also a member of **QUAD group**. A stronger Australia would lead to further strengthening of QUAD.
- o **For France**
  - France is not happy with the deal and has termed this deal a "stab in the back".
  - Australia had signed a contract to buy 12 Attack-class submarines from France in 2016. The first submarine was expected to be operational around 2034.
  - As a result of the current deal, Australia ditched the contract.

How China views this agreement?
- o China denounced a new Indo-Pacific security alliance saying such partnerships should not target third countries.
- o It claims that the current cooperation would gravely undermine regional peace and stability, aggravate arms race and hurt the international non-proliferation efforts.
- o China claimed that western powers are using **nuclear exports for geopolitical gaming tools**.
- o Under this deal, highly-sensitive nuclear powered submarine technology will be exported to Australia.

8. Parties, Serious Crimes, and the Need for Judicial Clarity

Context
- **Two recent observations** from different Benches of the Supreme Court of India **in the bail petitions of Delhi CM and former Delhi Deputy CM highlight critical issues** that warrant in-depth analysis.
- These **observations pertain to the involvement of political parties in criminal cases under the Prevention of Money Laundering Act (PMLA)** and the distinction between policy-making and criminality.
- Therefore, **it is necessary to explore these observations, analysing their legal implications and the potential consequences for India's political and judicial landscape.**

A Legal Analysis of Implication of Political Parties Under PMLA, Section 70 and ED's Argument to Implicate Under PMLA
- **Can a Political Party be Implicated Under PMLA?**
  - o The **observation by the SC Bench has sparked a broader debate** on the legal and constitutional implications of treating political parties as entities liable under criminal law, particularly in the context of the PMLA.
- **Understanding Section 70 of the PMLA**
  - o **To analyse this issue, it is essential to first understand the legal framework of the PMLA,** particularly Section 70, which the Enforcement Directorate (ED) invoked to include the Aam Aadmi Party (AAP) as an accused in the case.
  - o **Section 70 of the PMLA deals with offenses by companies,** stating that if a contravention of the Act is committed by a company, then every person in charge of and responsible for the company at the time of the offense is deemed guilty.
  - o The **section also includes an explanation that defines a company as any body corporate and includes a firm** or other association of individuals.
  - o At first glance, **this provision appears to apply broadly to various types of entities**, including firms and associations of individuals.
  - o However, the **question arises whether this definition extends to political parties.**

- The **explanation within Section 70 is primarily aimed at business entities engaged in economic activities**, which are often involved in generating and handling funds that could potentially be laundered.
- **Political Parties: Distinct from Business Entities**
  - **Political parties, by their very nature, are distinct from the types of entities** typically **covered under Section 70 of the PMLA.**
  - Unlike companies or firms, which are transactional and profit-driven, **political parties are ideological organisations.**
  - Their primary function is to mobilise citizens, contest elections, and form governments to implement policies reflecting their platforms.
  - **They do not engage in business activities in the traditional sense**, nor do they generate revenue through commercial transactions.
- **ED's Argument to Implicate AAP Under PMLA**
  - **The ED's argument is based on the definition of political parties from the Representation of the People Act (RPA) 1951**, posits that a political party can be considered an association of individuals under Section 70 of the PMLA.
  - **Section 29A of the RPA defines a political party as any association or body** of individual citizens of India calling itself a political party.
  - **While this definition aligns with the broad language of association of individuals in Section 70 of the PMLA**, it does not necessarily mean that political parties should be treated the same as business entities under criminal law.
  - The **distinction becomes clearer when considering the purpose and context of the PMLA.**
  - The **Act is designed to prevent the laundering of money** obtained from illegal activities, primarily targeting economic offenses where illicit funds are concealed or integrated into the formal economy.
  - **Political parties, however, do not operate within the same framework** as companies or firms.
  - They receive donations from individuals and corporations, which are regulated by election laws, not by laws governing economic transactions.

The Debate on Policy-Making vs. Criminality and the SC's Role
- **Policy Making vs Criminality**
  - **The second observation, made by a Bench** raised the critical question of **where to draw the line between policy-making and criminality.**
  - This question is particularly relevant in cases arising from policies framed by a cabinet, which, under the Indian Constitution, holds exclusive and final authority in policy matters.
  - Under the British system of parliamentary democracy adopted by India, **the cabinet, led by the PM at the Centre and CMs in the States, directs national policy.**
  - **While a policy may be subject to public or legislative disapproval, the judiciary traditionally does not assess the correctness or motivation behind cabinet decisions.**
  - Consequently, **criminal charges against an individual Minister for decisions made collectively by the cabinet are legally unsustainable** and have no precedent in the history of cabinet governments.
- **The Supreme Court's Role**
  - The **SC has consistently upheld the principle that policy decisions are beyond judicial scrutiny** unless they violate fundamental rights or are otherwise unconstitutional.
  - This **position underscores the need to protect the decision-making autonomy** of the executive branch.
  - **Charging Ministers with criminality for policies approved by the cabinet would undermine this autonomy** and could lead to a paralysis of governance.
  - **The judiciary, therefore, has a crucial role in ensuring that the line between policy and criminality is clearly defined and respected.**

Way Forward: The Need for Judicial Clarification
- The recent SC observations concerning the application of the PMLA to political parties and the distinction between policy-making and criminality highlight critical legal and constitutional issues.
- **Bringing political parties within the purview of the PMLA could have far-reaching and potentially destabilising consequences** for India's political system.

- Similarly, **blurring the line between policy-making and criminality could jeopardise the functioning of the cabinet** and the broader executive branch.
- In this context, **it is imperative for the judiciary to clarify the law regarding these matters.**
- **Such clarification would ensure that political parties are not unfairly targeted** under the PMLA and that Ministers are not wrongfully accused of criminality for collective cabinet decisions.
- **Upholding these principles is essential to maintaining the integrity of India's democratic processes** and ensuring the effective functioning of its government.

Conclusion
- **The SC's observation** in the case involving Arvind Kejriwal and the subsequent inclusion of the Aam Aadmi Party as an accused under the PMLA **represents a significant legal development with potentially wide-ranging implications.**
- **The application of Section 70 of the PMLA to political parties raises complex legal and constitutional questions** about the nature of political parties, their role in a democracy, and the limits of criminal liability under the PMLA.
- **It is imperative for the judiciary to clarify whether political parties can be equated with business entities for the purposes of the PMLA** and, if so, under what circumstances.

9. Waqf Amendment Bill

Why in the News?
- The Union government has referred the Waqf Amendment Bill 2024 to a Joint Parliamentary Committee (JPC), after opposition from various political parties.

What is Waqf?
- In Islamic law, a "waqf" refers to a **property dedicated to God for religious or charitable purposes**.
- This can include **both movable and immovable assets set aside to serve the public good**.
- Establishing a waqf is seen as an act of piety that allows Muslims to continue their charitable contributions even after death.
- A waqf can be formally created through a deed or may be recognized as such if a property has been used for religious or charitable activities over a long period.
- The income generated from these properties is typically used for maintaining mosques, funding educational institutions, or supporting the poor.
- Notably, once a property is designated as waqf, it **cannot be inherited, sold, or transferred**.
- **Non-Muslims can also establish a waqf**, provided the purpose aligns with Islamic principles.

Regulation of Waqf in India:
- In India, waqf properties are governed by the **Waqf Act of 1995.**
- The identification and documentation of these properties are carried out through a survey conducted by the State government.
- **A survey commissioner, appointed under the Act, investigates the properties, gathers witness testimonies, and reviews public documents to identify waqf assets.**
- Once identified, these properties are officially recorded in the State's gazette, and a detailed list is maintained by the State Waqf Board.
- The management of each waqf is overseen by a mutawalli, or custodian, who is responsible for its administration.
- While similar to trusts established under the Indian Trusts Act of 1882, waqfs differ in that they cannot be dissolved by a governing board.

Role of Waqf Board:
- **State Waqf Boards:**
  - The **Waqf Act of 1995 establishes Waqf Boards in each State to oversee the management of waqf properties within their jurisdiction.**

- o These Boards are legal entities with the ability to sue or be sued in court.
- o Each State Waqf Board is led by a chairperson and includes representatives from the State government, Muslim legislators, recognized Islamic scholars, and mutawallis of waqfs.
- o The **Act mandates the appointment of a full-time Chief Executive Officer (CEO) for each Board**.
- o The CEO must be a Muslim and hold at least the rank of Deputy Secretary in the State government.
- **Powers & Responsibilities:**
  - o The Waqf Board is empowered to manage waqf properties and recover any assets that have been lost.
  - o It can **approve the transfer of immovable waqf property through sale, gift, mortgage, exchange, or lease, but such actions require the approval of at least two-thirds of the Board members.**
  - o Amendments made to the Waqf Act in 2013 further strengthened the Board's authority, making it **nearly impossible to sell waqf properties, as neither the mutawalli nor the Board can sell waqf assets without stringent conditions**.
- **Central Waqf Council:**
  - o In addition to the State Waqf Boards, the legislation also establishes the Central Waqf Council, a national advisory body under the Ministry of Minority Affairs.
  - o This Council, **headed by the Union Minister of Minority Affairs**, ensures uniform administration of waqf properties across India.
  - o It advises the Union government on various waqf-related issues, including policy development, implementation of waqf laws, and resolving inter-State disputes.
  - o This structured framework aims to preserve the religious and charitable intent behind waqf properties, ensuring their proper management and protection under Indian law.

Amending the 1995 Waqf Act:
- The **Union government on August 8 introduced a Bill in the Lok Sabha to amend the 1995 Act (to be renamed as the Unified Waqf Management, Empowerment, Efficiency, and Development Act).**
- The proposed amendments seek to significantly reform the law by enhancing the Centre's regulatory authority over waqf properties and, for the first time, permitting the inclusion of non-Muslim members in Waqf Boards.

Key Changes Proposed in the Amendment Bill:
- **Revised Definition of 'Waqf':**
  - o Only lawful property owners who have practiced Islam for at least five years can now create waqf properties through formal deeds.
  - o The **concept of 'waqf by use,' which allowed properties to be deemed waqf based on usage even if the original deed was disputed, has been abolished**.
  - o Government properties cannot be recognized as waqf.
  - o Widows, divorced women, and orphans can benefit from waqf proceeds.
- **Role of District Collectors:**
  - o **District collectors (or equivalent officers) will now survey waqf properties, replacing survey commissioners.**
  - o A centralized registration system for waqf properties will be established, and all details must be uploaded within six months of the law's enactment.
  - o New waqf properties must be registered through this system.
  - o The **district collector will have the final say on whether a property is waqf,** and a Waqf Board cannot control disputed land until the collector submits the final report.
- **Inclusion of Non-Muslim Members:**
  - o **Non-Muslims can now be included in key waqf institutions like the Central Waqf Council, State Waqf Boards, and waqf tribunals.**
  - o The Central Waqf Council will include three Members of Parliament, who do not necessarily have to be Muslim.
  - o State Waqf Boards must now include two non-Muslims and two women.
  - o Waqf tribunals will now be reduced to a two-member body, consisting of a district judge and a State government officer, and must resolve disputes within six months.
- **Financial Oversight:**
  - o The Centre can order audits of any waqf property by an auditor appointed by the Comptroller and Auditor-General of India.

- o Waqf Boards must audit their accounts annually, using auditors from a State government panel.
  - o Penalties will be imposed on mutawallis (custodians) who fail to maintain proper accounts.
- **Judicial Review:**
  - o **Courts can now intervene in waqf disputes**, allowing appeals to be made directly to the High Court, increasing judicial oversight over waqf decisions.

10. Sheikh Hasina's exit and impact on India

Why in news?

A week after protests in Bangladesh led to the ousting of former Prime Minister Sheikh Hasina, who fled to India, her future remains uncertain. The **Indian government, under Narendra Modi, has provided her with refuge while simultaneously beginning to engage with the new regime that replaced her Awami League government**. India is also assessing the impact these political changes in Bangladesh will have on its bilateral relations.

India – Bangladesh Relation during Hasina's tenure
- Sheikh Hasina's removal from power in Bangladesh marks a significant setback for India, given the strong bilateral ties forged over the past 15 years.
- From her return to office (2009), Ms. Hasina made her intentions of strong ties with Delhi clear.
  - o She **began a nationwide crackdown to shut down terror camps, a campaign against religious radicalisation, and extradited over 20 most wanted men accused of terrorism and crime to India.**
  - o **Hasina also worked on ending border tensions caused by illegal immigration into India,** particularly the 2001 incident where brutal BDR-BSF clashes left 15 dead.
  - o Several border patrolling agreements and the signing of the historic 2015 land boundary agreement followed.
- **India, in turn, supported Bangladesh through trade concessions, Lines of Credit, and various connectivity projects, helping transform the country's economy.**
  - o The Manmohan Singh and Modi governments provided Bangladesh with trade concessions and low-interest Lines of Credit.
  - o It **supported Sheikh Hasina's efforts to transform the country from a struggling economy into a developing nation that surpassed its neighbors in human development indices.**
- Hasina's government, despite becoming increasingly authoritarian, maintained strong relations with India.
- **She stood with India on every issue, from boycotting SAARC (South Asian Association for Regional Cooperation) over terrorism from Pakistan, to the Citizenship Amendment Act that set off protests in Bangladesh.**
- Bangladesh has become crucial to India's regional connectivity plans and energy exports.
- However, with her ouster, there is concern that many of the agreements and progress made, including recent power deals with the Adani group, may now be re-evaluated under the new regime.

Can India Build Strong Relations with Bangladesh's New Leadership?
- India continues to engage with Bangladesh's interim government led by Muhammad Yunus, as demonstrated by the Indian High Commissioner's attendance at the swearing-in ceremony.
- However, **several challenges complicate India's relationship with the new regime**.
- Firstly, Sheikh Hasina's presence in India is causing suspicion in Dhaka, and India may prefer her to leave India until tensions ease.
  - o If the new government demands her extradition, it could create further complications.
- **Secondly, potential elections could bring the BNP to power**, and India has had a difficult experience with the BNP government from 2001-2006, when Bangladesh harbored anti-India groups and aligned with China and Pakistan.
- **Lastly, PM Modi's appeal for the safety of Hindus and minorities in Bangladesh**, along with the establishment of a committee to ensure their protection, is being viewed as partisan in Dhaka, potentially straining relations further.

Impact on Bangladesh's ties with other countries
- The recent changes in Dhaka will likely affect Bangladesh's international relations, especially with the **U.S., which has been critical of the Hasina government and may have played a role in her downfall.**

- The U.S**. had implemented a special visa policy to promote democracy in Bangladesh**, targeting Hasina and her party, so ties with the new government are expected to improve.
- Relations with Pakistan, strained under Hasina, might also improve.
- Despite Hasina's close ties with China, including joining the Belt and Road Initiative, Beijing is expected to establish strong relations with the new government as well.

11. Performance of Ayushman Bharat Scheme

Why in the News?
Beneficiaries aged 70 years and above made up over 12 per cent of all admissions under the government's flagship Ayushman Bharat health insurance scheme, according to data presented in Parliament by the Union Ministry of Health and Family Welfare.

About Ayushman Bharat Scheme:
- Ayushman Bharat, a flagship scheme of Government of India, was launched in 2018 as recommended by the **National Health Policy 2017**.
- **Objective**: To achieve the vision of Universal Health Coverage.
- This initiative has been designed to meet **Sustainable Development Goal number 3** and its underlining commitment, which is to "leave no one behind."
- Ayushman Bharat adopts a continuum of care approach, comprising of two inter-related components, which are:
  - **Pradhan Mantri Jan Arogya Yojana (PM-JAY)**
    - It provides **health insurance cover of Rs. 5 lakhs per year** to over 10 crore poor and vulnerable families for seeking secondary and tertiary care.
  - **Health and Wellness Centres (HWCs)**

About Ayushman Bharat Health and Wellness Centres (HWCs):
- In February 2018, the Government of India announced the creation of 1,50,000 Health and Wellness Centres (HWCs) by transforming the existing Sub Centres and Primary Health Centres.
- The goal is **to ensure access to quality healthcare closer to the community**, thereby improving health outcomes and reducing out-of-pocket healthcare expenditures for individuals and families.
- These centres provide free essential medicines and diagnostic services, teleconsultation, and health promotion including wellness activities like Yoga.
- The **HWCs also offer annual screening for those 30 years or older for Non Communicable Diseases** such as:
  - Hypertension, Diabetes, and three of the most common Cancers in India — oral, breast and cervical.

Progress/Achievements under Ayushman Bharat Scheme:
- The scheme crossed the milestone of **30 crore Ayushman cards** in January2024.
- In order to reach out to the last mile, NHA has launched 'Ayushman App' for Ayushman Card creation.
- With 4.83 crore Ayushman Cards, Uttar Pradesh tops the list of States with the highest number of Ayushman Cards crated. Madhya Pradesh and Maharashtra stand at number two and three positions with 3.78 crore and 2.39 crore Ayushman cards respectively.
- 48% of treatment provided under the scheme has been availed by the female; thus, gender equity is part of core design of the scheme.

- Further, **Ayushman Bharat has successfully catered to 6.2 crore hospital admissions worth more than Rs. 79,000 crores**.

Performance of Ayushman Bharat Scheme:
- The Ayushman Bharat health insurance scheme data presented in Parliament reveals that **beneficiaries aged 70 years and above constituted over 12% of all admissions and nearly 14% of the total expenditure till January 2024**.
- Of the nearly 6.2 crore approved hospital admissions till January 2024, 57.5 lakh were for senior citizens aged 70 years and above, with treatment costs amounting to more than Rs 9,800 crore out of the **total Rs 79,200 crore spent over the last six years**.
  - The government's plan to expand Ayushman Bharat to include all individuals over 70, irrespective of economic status, is set to add nearly 4 crore new beneficiaries.
- Expanding coverage to older people of means will likely increase the policy's utilization and costs.
- The interim budget in February **extended the scheme to ASHA and Anganwadi workers, but no further expansion was mentioned in the July budget, with a slight increase in allocation to Rs 7,300 crore**.
- **India's ageing population is projected to rise from 8.6% in 2011 to 19.5% by 2050**, tripling in absolute numbers from 103 million in 2011 to 319 million in 2050.
- Hospital admissions for older individuals exceeded their population share in several states, with Maharashtra leading at 20.49%.
  - In contrast, Tamil Nadu recorded the lowest proportion of admissions (3.12%) but had higher treatment costs for the elderly.
- States **like Maharashtra, Kerala, Haryana, Himachal Pradesh, Bihar, and others had the highest proportions of spending on elderly care.**
- Treatments for the elderly are costlier due to longer healing times, higher likelihood of secondary infections, need for ICU care, and multiple comorbidities.

12. Supreme Court Verdict on Caste Sub-Classification is a Landmark and Benchmark

Context
- The **recent Supreme Court ruling permitting the subdivision of reservation quotas for Scheduled Castes (SC)** and Scheduled Tribes (ST) **marks a significant shift in India's approach to social justice policies.**
- This **7-judges bench decision has not only allowed state governments to sub-divide these reservation quotas but also opened the door for identifying and excluding the creamy layer** within SC and ST categories from the benefits of affirmative action.
- Therefore, **it is crucial to examine the implications of this landmark judgment, its legal background, and its potential impact on social justice policies** in India.

An Overview of the Constitutional Framework of Reservation and States' Power
- The **foundation of the reservation system** in India lies in the Indian Constitution, **specifically in Articles 15(4), 16(4), 46, and 341.**
- **Article 15(4) empowers the state to make special provisions** for the advancement of socially and educationally backward classes or for the SCs and STs.
- **Article 16(4) allows the state to make provisions for the reservation of appointments or posts in favour of any backward class of citizens** that, in the opinion of the state, is not adequately represented in the services under the state.
- **Article 46 promotes the educational and economic interests of SCs, STs,** and other weaker sections.
- **Article 341 defines and provides the procedure for the classification of SCs.**
  - According to Article 341(1), the President, after consultation with the Governor of a state, specifies the castes and classes as SCs in relation to that state or union territory.
  - **Article 341(2) states that Parliament may by law include or exclude from the list of SCs** specified in a notification under Article 341(1).

Historical Context and Legal Background of Recent Supreme Court's Judgement

- **The E V Chinnaiah Judgment (2004)**
  - o In **2004, the Supreme Court addressed the issue of sub-classification** within the SC category in the E V Chinnaiah case.
  - o The **case arose from Andhra Pradesh, where the state government had created sub-quotas within the SC reservation** to address the varying levels of disadvantage among different SC communities.
  - o The **five-member bench of the Supreme Court ruled against this move**, holding that SCs are a homogeneous class and should not be subdivided.
  - o The **Court's ruling was based on a strict interpretation of Article 341,** arguing that any sub-classification would violate the intent of the constitutional provision, which treated SCs as a single, unified group.
  - o The **judgment emphasised legal formalism, stating that allowing sub-categorisation would lead to administrative complexities** and potential inequalities within the SC category.

- **Criticisms of E V Chinnaiah Judgment**
  - o The **E V Chinnaiah judgment faced significant criticism** for its lack of consideration of the social realities faced by different SC communities.
  - o Critics argued that **the judgement failed to recognise the inherent inequalities within the SC category.**
  - o Historically, **different SC communities have experienced varying degrees of social and educational disadvantage,** often based on their traditional occupations and geographical locations.
  - o For example, **educational attainment among SC communities varies widely.** Data from caste surveys in states like Bihar and Tamil Nadu reveal stark disparities.
  - o **In Bihar, higher education attainment among SC communities like Dhobis was significantly higher** compared to the Musahar community.
  - o **In Tamil Nadu, the Arunthathiyars, despite constituting a significant portion of the SC population, were grossly underrepresented** in government employment.

- **The Path to the Davinder Singh Case**
  - o In response to the criticisms and the apparent need for a more nuanced approach to affirmative action, **state governments continued to advocate for the ability to sub-classify SCs.**
  - o The **State of Punjab vs. Davinder Singh case emerged as a critical legal battle,** representing the culmination of efforts to revisit and potentially overturn the E V Chinnaiah ruling.
  - o **In 2014, Chief Justice R.M. Lodha observed the need for a reconsideration of the sub-classification issue**, and in 2020, a five-member bench referred the matter to a seven-member bench for final adjudication.
  - o The **legal discourse surrounding this issue emphasised the necessity of aligning constitutional interpretation** with social realities and the principles of distributive justice.

- **The Supreme Court's Progressive Judgment**
  - o The **7-judges bench,** led by Chief Justice D.Y. Chandrachud, **delivered a landmark judgment that overturned the E V Chinnaiah ruling.**
  - o The **Court held that state governments have the authority to sub-classify SCs** to identify and provide more focused benefits to the most disadvantaged groups within the category.
  - o This **decision was rooted in the recognition that SCs are not a homogeneous group** and that equitable affirmative action requires addressing internal disparities.
  - o The **judgment emphasised the principle of distributive justice**, arguing that equal protection under the law must account for the varying degrees of disadvantage faced by different SC communities.
  - o **By prioritising substance over form, the Court demonstrated a commitment to social justice** and the need for evidence-based policies.

Impact of Supreme Court's Judgement on Social Policies in India

- **Addressing Intra-Category Inequality**
  - o The judgment acknowledges that the SC and ST categories are not homogeneous and that there are significant disparities within these groups.
  - o **By allowing the subdivision of reservation quotas, the Court has paved the way for more granular and equitable distribution** of benefits.
- **Enhancing Policy Formulation and Implementation**

- o **By advocating for the subdivision** of quotas and the potential exclusion of the "creamy layer," **the Court has emphasised the need for policies grounded in empirical data.**
- o This approach can lead to more effective and targeted interventions.
- **The Creamy Layer Concept and its Extension**
  - o Historically, **the exclusion of the creamy layer**, those members of the OBC category who are relatively better off, has been applied to ensure that the **benefits of affirmative action reach the truly disadvantaged within the OBCs.**
  - o Extending this concept to SCs and STs is a contentious but potentially transformative idea.

Potential Challenges and Political Ramifications
- Despite its progressive stance, **the judgment is likely to face challenges both legally and politically.**
- **Critics may argue** that sub-classifying SCs and STs and **excluding the creamy layer could dilute the affirmative-action regime.**
- **There may be concerns that these changes could create divisions within the SC and ST communities** or be used for political manoeuvring.
- Politically, **the judgment could be seen as aligning with the current regime's efforts to refine and perhaps limit the scope of affirmative action.**
- **Some political factions may interpret the decision as an attempt to fragment the Dalit community** or weaken the overall impact of reservation policies.

Way Forward: Ensuring Equitable Implementation
- For the judgment to achieve its intended impact, **it is crucial that state governments and policymakers adopt a transparent and evidence-based approach.**
- This **involves conducting comprehensive surveys and detailed socio-economic surveys** to identify disparities within SC and ST communities.
- The **government would need to establish clear and context-specific criteria** for sub-classification and the exclusion of the creamy layer.
- **Implementing robust monitoring and evaluation mechanisms is crucial** to assess the impact of these changes and make necessary adjustments.
- The **government should ensure that affected communities are aware of these changes** and have a voice in the implementation process.

Conclusion
- **The Supreme Court's recent judgment on subdividing reservation quotas for SCs and STs represents a pivotal step** in refining India's social justice policies.
- By acknowledging the heterogeneous nature of these categories and advocating for data-driven, equitable affirmative action, **the Court has paved the way for more nuanced and effective social justice measures.**
- As India continues to grapple with the complexities of caste-based inequalities, **this judgment offers a robust framework for ensuring that the benefits of affirmative action reach those who need them the most.**

General Studies III

1. Organic Farming in India

Why in the News?
- Union Home and Cooperation Minister Amit Shah said that it has been proven now that chemicals present in fertilizers are the source of several health ailments such as hypertension, diabetes, thyroid and even cancer.

Organic Farming in India:
- Organic farming is an agricultural practice that **relies on natural processes and inputs to cultivate crops and rear livestock**, avoiding the use of synthetic fertilizers, pesticides, genetically modified organisms (GMOs), and growth regulators.
- It emphasizes sustainability, environmental health, and the conservation of biodiversity.

Benefits of Organic Farming:
- **Enhanced Soil Fertility:**
  o Use of compost, green manure, and crop rotation improves soil structure and fertility over time.
- **Pest and Disease Control:**
  o Natural pest predators and organic pesticides help manage pests without harming beneficial insects or the environment.
- **Water Conservation:**
  o Organic farming practices promote better water retention in soil, reducing the need for irrigation.
- **Reduced Greenhouse Gas Emissions:**
  o Lower use of chemical fertilizers and pesticides results in reduced carbon and nitrous oxide emissions.
- **Improved Farmer Livelihoods:**
  o Access to premium markets and reduced input costs can lead to better income stability for farmers.
- **Health Benefits:**
  o Produces food free from harmful chemical residues, ensuring safer and healthier consumption.
  o Enhances nutritional quality of produce, often resulting in higher levels of vitamins and minerals.
- **Economic Advantages:**
  o Opens up premium markets for organic products, potentially increasing farmers' income.
  o Reduces dependency on expensive chemical inputs, lowering production costs in the long run.

Government Initiatives & Policies:
- **Paramparagat Krishi Vikas Yojana (PKVY):**
  o Launched in 2015, PKVY is a **flagship program aimed at promoting organic farming in clusters to ensure uniformity and quality.**
  o The scheme encourages farmers to adopt traditional agricultural practices, reducing the use of chemical fertilizers and pesticides.
- **Mission Organic Value Chain Development for North Eastern Region (MOVCDNER):**
  o Launched in 2015, this scheme focuses on the organic agriculture potential of the North Eastern region, aiming to make it a hub for organic produce.
- **Jaivik Kheti Portal:**
  o Launched in 2018, the portal is a dedicated online platform to facilitate organic farming practices and marketing.
- **National Programme for Organic Production (NPOP):**
  o Launched in 2001, NPOP aims at establishing standards for organic products, certifying organic products, and promoting their export.
- **Organic Certification:**
  o **Participatory Guarantee System (PGS)**: A locally-focused quality assurance system for organic products, which is farmer-friendly and less costly.

- o **National Certification System for Organic Products (NCSOP)**: A more formal certification system to ensure that products labelled as organic meet the required standards.

Challenges Faced:
- **Certification Costs:**
  - o High costs and complex procedures for organic certification deter many small and marginal farmers from adopting organic practices.
- **Lack of Awareness and Training:**
  - o Limited knowledge about organic farming techniques and benefits hampers widespread adoption.
- **Market Access:**
  - o Insufficient infrastructure and limited market linkages restrict the ability of organic farmers to sell their produce at premium prices.
- **Supply Chain Issues:**
  - o Inadequate storage and transportation facilities can lead to post-harvest losses, affecting the profitability of organic farming.
- **Transition Period:**
  - o Farmers need to undergo a transition period (typically two to three years) to convert from conventional to organic farming, during which they may experience reduced yields without immediate financial returns.

2. Global Fintech Fest (GFF) 2024

Why in news?
PM Modi addressed the Global Fintech Fest (GFF) 2024 at the Jio World Convention Centre in Mumbai, Maharashtra. GFF is jointly organized by the Payments Council of India, the National Payments Corporation of India and the Fintech Convergence Council. It aims to showcase India's strides in Fintech and bring together key stakeholders of the sector.

Fintech
- **About**
  - o Fintech, or financial technology, refers to **the use of technology to deliver financial services in a more efficient, accessible, and user-friendly way.**
  - o It encompasses a broad range of innovations that aim to improve and automate the delivery and use of financial services, often through digital platforms.

Applications
- o **Digital Payments**
  - ▪ Platforms that allow people to make payments, transfer money, and conduct financial transactions online or through mobile devices (e.g., UPI, Google Pay).
- o **Lending and Borrowing**
  - ▪ Online platforms that offer loans to individuals or businesses, often using data-driven algorithms to assess creditworthiness (e.g., peer-to-peer lending, digital loan apps).
- o **Wealthtech**
  - ▪ Platforms and tools for investment management and financial planning, including robo-advisors, online brokerage services, and digital asset management.
- o **Blockchain and Cryptocurrency**
  - ▪ Technologies that facilitate secure, decentralized financial transactions, including cryptocurrencies like Bitcoin and blockchain-based financial services.
- o **Regtech**
  - ▪ Technologies that help financial institutions comply with regulations in an efficient and cost-effective manner, often using AI and big data.
- o **Neobanking**
  - ▪ Digital-only banks that offer banking services without physical branches, often through mobile apps or online platforms.

Benefits
- o **Financial Inclusion**
    - Through digital platforms, **fintech companies have brought banking and financial services to the underserved and unbanked populations, especially in rural and remote areas.**
    - Mobile banking, digital wallets, and micro-lending platforms have empowered millions of people, enabling them to participate in the formal economy, save money, access credit, and invest.
- o **Job Creation and Economic Growth**
    - The **fintech sector has become a major driver of job creation in India**, offering opportunities in technology, finance, marketing, and customer service.
    - As fintech companies grow, they **contribute to the economy by generating employment** and stimulating demand for various ancillary services.
    - Additionally, by streamlining financial processes and reducing transaction costs, fintech has improved business efficiency.
    - It supported the growth of small and medium-sized enterprises (SMEs), further boosting economic development.
- o **Digital Payments Revolution**
    - India's fintech revolution is perhaps best exemplified by the widespread adoption of digital payments.
    - It has increased transparency, reduced corruption, and made financial transactions more secure and efficient.
- o **Impact on Urban and Rural Divide**
    - **Fintech has helped bridge the urban-rural divide by providing equal access to financial services regardless of geographic location.**
    - Through mobile technology, people in rural areas can access the same financial tools and resources as those in urban centers, thereby promoting economic equity and reducing regional disparities.

Concerns
- o **Fintech Companies and Money Laundering Concerns**
    - A Parliamentary Committee highlighted that fintech companies were being exploited by scamsters for money laundering purposes.
    - An example cited was the **Abu Dhabi-based app called Pyppl, which was reportedly administered by Chinese investment scamsters.**
    - This situation posed challenges for Indian law enforcement agencies in tracking the flow of illicit funds gathered through scams on the platform.
- o **Fraud Trends and Ratio**
    - Despite an increase in the volume of transactions over the past five years, the ratio of fraudulent transactions to total transactions has remained relatively low.
- o **Impact on UPI Users**
    - The percentage of UPI users affected by frauds stood at 0.0189%.
    - Despite concerns about fintech platforms being used for illegal activities, the overall impact on users remained relatively low compared to the total volume of transactions.

Key highlights of speech delivered by PM Modi at GFF 2024
- **India's Fintech Revolution**
    - o **Global Recognition**: Modi emphasized how India's fintech diversity is now as impressive as its cultural diversity to foreign visitors.
    - o **Investment and Growth**: The sector has seen over $31 billion in investments in the last decade and a 500% growth in startups.
    - o **Infrastructure Development**: The increase in broadband users from 60 million to 940 million and the widespread adoption of Aadhaar and Jan Dhan accounts have been key drivers of this revolution.
- **Jan Dhan, Aadhaar, and Mobile Trinity**
    - o **Digital Transactions**: The combination of Jan Dhan accounts, Aadhaar, and mobile technology has facilitated half of the world's digital transactions in India.
    - o **Impact of UPI**: India's Unified Payments Interface (UPI) has revolutionized 24/7 banking, even in rural areas.

- **Financial Empowerment**
  - **Women Empowerment**: Modi highlighted the role of Jan Dhan Yojana in empowering women, with over 29 crore bank accounts for women and significant benefits for rural women through self-help groups.
  - **Mudra Yojana**: The scheme has disbursed Rs 27 trillion, benefiting 70% women, demonstrating the role of fintech in financial inclusion.
- **Transparency and Governance**
  - **Curbing Parallel Economy**: Fintech has introduced transparency in financial transactions, particularly through Direct Benefit Transfer (DBT) in government schemes, reducing leakages.
- **Social Impact of Fintech**
  - **Urban-Rural Gap Bridging**: Fintech has transformed access to financial services, enabling farmers, fishermen, and middle-class families to manage their finances through mobile phones.
  - **Democratization of Financial Services**: Fintech has made credit, investments, and insurance more accessible, benefiting even small vendors through schemes like PM SVANidhi.
- **Advancements in Digital Banking**
  - **Neobanking and Digital Only Banks**: Modi discussed modern concepts like neobanking and the shift from currency to QR codes, highlighting innovations such as Digital Twins technology and Open Network for Digital Commerce (ONDC).
  - **Account Aggregators and e-RUPI**: These tools are improving financial management for small businesses and are applicable globally.
- **Cybersecurity and Regulation**
  - **Policy Support**: The government is facilitating fintech growth by removing Angel Tax, investing in research, and implementing the Digital Personal Data Protection Act.
  - **Cyber Fraud**: Modi emphasized the importance of digital literacy and robust regulatory measures to combat cyber fraud.
- **Sustainable Economic Growth**
  - **Green Finance**: The government prioritizes sustainable growth, focusing on green finance and financial inclusion to strengthen markets with advanced technologies.
- **Future Outlook**
  - Modi expressed confidence in the future of India's fintech ecosystem, predicting it will significantly enhance the quality of life globally and committed to participating in the 10th edition of GFF.

3. Incentivising Semiconductor Manufacturing in India

Why in News?
The Indian government, having nearly exhausted the $10 billion subsidy under its ambitious semiconductor manufacturing incentive policy, is planning a second phase with a $15 billion outlay.
This **expansion aims to provide capital support for raw materials and gases used in chip manufacturing, while reducing subsidies for assembly and testing plants.**

India's Semiconductor Ambitions:
- **Background:**
  - In today's world, semiconductors constitute the **backbone of modern electronics**, indispensably situated at the junction of a wide range of industries.
  - Given their broad applicability, countries across the globe are strategising to mitigate risks associated with over-reliance on a single supply source of semiconductor chips.
  - This also serves to fortify national security and economic well-being, considering recent geopolitical conflicts.
- **Advantages to India:** India has 20% of the world's semiconductor design **workforce**, a rapidly evolving **technology** landscape and a thriving domestic **market**, all of which are conducive in building an indigenous semiconductor ecosystem.

  How to sustain the growing momentum?
- **Pacing up of initiatives:**

- In the last few decades (prior to the current push), India made multiple attempts to join the global semiconductor industry but fell short primarily due to the lack of proactiveness in policy implementation.
    - Drawing lessons from the past, the government can ensure swift execution of policies under its freshly formulated strategy.
- **Inching up the value chain:** To establish an end-to-end semiconductor ecosystem, India can consider strategically moving across the industry value chain.
- **Leveraging the talent edge:** Estimates say that India will require 1.2 million skilled people in the semiconductor sector by 2032. The clock is ticking, and India must develop its talent ecosystem fast.

India's Major Leap into Semiconductor Manufacturing:
- The government is aiming for India to be among the top five global destinations (on the lines of the United States, Taiwan and South Korea) for semiconductor manufacturing by **2030**.
- **Government initiatives**, such as the National Electronics Policy or the USD10 billion production linked incentive (PLI) scheme for semiconductor manufacturing, are also boosting India's chipmaking aspirations.
- India has been luring foreign companies to set up operations in the country. **For example**,
    - The country has approved a fabrication plant worth $11 billion being set up by Tata Electronics in partnership with Taiwan's Powerchip.
    - 3 different chip assembly plants are being set up by the Tatas, US-based Micron Technology, and Murugappa Group's CG Power in partnership with Japan's Renesas.
- Hence, with the right blend of proactive actions, tech skills, infrastructural acceleration and fiscal investments, India has the potential to achieve this target.

The Semiconductor Manufacturing Incentive Policy:
- **In the first iteration** of the incentive policy released in 2021,
    - The Centre had offered a 30% capex subsidy for chip packaging and testing plants.
    - However, the Centre had increased the subsidy for such plants to 50% in 2022.
- **The Semiconductor Manufacturing Incentive Policy 2.0:**
    - **Focus on chip fabrication:**
        - India wants to go up (beyond assembly and packaging facilities) the complexity ladder in the semiconductor ecosystem, where nations like Malaysia already have a stronghold.
        - Therefore, the new scheme could see an **increased focus on fabrication plants, and more advanced display technologies.**
    - **Technology transfer costs:**
        - Under the new incentive scheme, the government **does not want to support** technology transfer costs.
        - This implies that companies that collaborate with others to use their technology for chip fabrication may have to pay for it themselves.
    - **Capital equipment and ecosystem support:**
        - Under the new scheme, the government could also offer capital equipment and ecosystem support such as gases, chemicals, and raw materials needed at assembly and testing plants.
        - It could also look at incentivising fabrication of micro-LED displays.

4. Centre Redesigns Agricultural Infrastructure Fund to Cover FPOs

Why in the News?
The Union Cabinet has expanded the scope of the Agricultural Infrastructure Fund (AIF). The scheme, worth ₹1 lakh crore, would be redesigned to include financial support for Farmers' Producers Organisations (FPOs) to enhance their financial security and creditworthiness.

About Agricultural Infrastructure Fund (AIF):
- It is an initiative launched by the Government of India in July 2020 as part of the Atmanirbhar Bharat Abhiyan.
- The primary objective of this fund is **to provide financial support to create and modernize agricultural infrastructure**, thereby enhancing the overall efficiency of the agricultural sector in the country.

Key Features of the Agricultural Infrastructure Fund:

- **Financial Support:**
  o The AIF provides medium to long-term debt financing to develop post-harvest management infrastructure and community farming assets.
  o The scheme aims to attract investments for agricultural infrastructure development, with a total allocation of Rs 1 lakh crore to be distributed through banks and financial institutions until 2025-26.

- **Interest Subvention:**
  o The scheme offers an interest subvention of 3% per annum on loans up to ₹2 crore. This subvention is available for a maximum of seven years.

- **Credit Guarantee:**
  o Credit guarantee coverage is provided through the Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE) scheme for eligible borrowers.
  o This ensures that the risk is mitigated for lending institutions, encouraging them to extend loans to farmers and agribusinesses.

- **Eligible Entities:**
  o The fund is accessible to a wide range of entities including farmers, Primary Agricultural Credit Societies (PACS), Farmer Producer Organizations (FPOs), Self Help Groups (SHGs), and entrepreneurs engaged in agriculture.

- **Infrastructure Development:**
  o The fund supports the development of critical infrastructure such as cold storage facilities, warehouses, grading and sorting units, processing units, and other post-harvest management facilities.
  o It also encourages the development of community farming assets like organic input production units, custom hiring centres, and renewable energy assets.

- **Digital Integration:**
  o The AIF is integrated with digital platforms such as the **e-NAM** (National Agriculture Market), ensuring better market access for farmers and reducing inefficiencies in the supply chain.

Benefits of the Agricultural Infrastructure Fund:

- **Reduction of Post-Harvest Losses:**
  o By improving storage and processing facilities, the AIF aims to reduce post-harvest losses, which are a significant concern in Indian agriculture.

- **Increased Farmers' Income:**
  o Enhanced infrastructure and better market access through e-NAM are expected to increase farmers' income by reducing waste and improving the value realization of their produce.

- **Rural Employment:**
  o The creation and modernization of agricultural infrastructure will generate rural employment, contributing to the economic development of rural areas.

- **Sustainable Agriculture:**
  o The focus on modern infrastructure also promotes sustainable agricultural practices, ensuring long-term benefits for the sector.

What is a Farmer Producer Organization (FPO)?

- A Producer Organisation (PO) is a legal entity formed by primary producers, viz. farmers, milk producers, fishermen, weavers, rural artisans, craftsmen.
- The main aim of PO is **to ensure better income for the producers through an organization of their own**.
- The ownership of the PO is with its members. It is an organization of the producers, by the producers and for the producers.
- **FPO is one type of PO where the members are farmers.**
- FPO operatives provide education and training for their farmer-members, elected representatives, managers, and employees so that they can contribute effectively to the development of their FPOs.

Centre Redesigns Agricultural Infrastructure Fund to Cover FPOs:

- The Union Cabinet has announced an expansion of the Agricultural Infrastructure Fund (AIF).

- The redesigned scheme will now include financial support for Farmers' Producers Organisations (FPOs) to enhance their financial stability and creditworthiness.
- The government highlighted that the **expanded AIF will make the scheme more attractive and inclusive, thereby strengthening agricultural infrastructure across the country**.
- So far, **₹47,575 crore has been sanctioned for 74,508 projects under the AIF, leading to a total investment of ₹78,596 crore in the agriculture sector**, with ₹78,433 crore coming from private entities.
- These projects have also **generated over 8.19 lakh rural jobs**.
- The **expansion of the AIF is expected to further boost agricultural growth, improve productivity, increase farm incomes**, and contribute to the sustainability of agriculture in India.

5. Drug money endangering country's security, economy

Why in news?
Union Home Minister and Minister of Cooperation virtually inaugurated the Zonal Unit Office of the Narcotics Control Bureau (NCB) in Raipur, Chhattisgarh.
Reaffirming Prime Minister Narendra Modi's commitment to a drug-free India by 2047, the Home Minister emphasized that drugs not only devastate the nation's youth but also undermine national security and the economy. The revenue generated from illegal drug trade fuels terrorism and left-wing extremism, posing a serious threat to the country.

Narcotics Control Bureau (NCB)
- **About**
  - NCB is the apex drug law enforcement and intelligence agency of India, established in 1986 under the **Narcotic Drugs and Psychotropic Substances Act (NDPS Act), 1985**.
  - The NCB is responsible for combating drug trafficking and the abuse of illegal substances.
- **Nodal ministry:** NCB operates under the Ministry of Home Affairs, Government of India.
- **Performance of NCB**
  - Between 2014 and 2024, 4,150 drug cases were registered, a 230% rise from the 1,250 cases between 2004 and 2014.
  - Arrests surged from 1,360 to 6,300, and drug seizures grew by 257%.
  - The value of drugs seized between 2004 to 2014 was ₹5,900 crore while the value of drugs seized between 2014 to 2024 was ₹22,000 crore.
  - In terms of volume, 5,43,000 kg of drugs were seized between 2014 and 2024.

Drug menace in India - Reasons for Widespread Drug Abuse in India
- **To escape from hard realities of life –**
  - The disintegration of the old joint family system, decline of old religious and moral values etc. lead to a rise in the number of drug addicts who take drugs to escape hard realities of life.
- **Loosening of the traditional methods of social control**
  - The loosening of the traditional methods of social control left an individual vulnerable to the stresses and strains of modern life.
- **Peers pressure**
  - Many youths start using drug under the pressure from their friends, seniors at educational institutions, or by members of their informal groupings.
- **Easy Availability**
  - India is situated in the sense that on its west is the 'Golden Crescent' and on east is the 'Golden Triangle'.
    - Golden Crescent - Iran-Afghanistan-Pakistan
    - Golden Triangle - Thailand, Laos, and Myanmar
  - The usage of drugs in India is increasing, particularly in the border areas due to their porous nature.
- **Economic prosperity**
  - The agricultural reforms and other industrial activity have led to increase in income in regions like Punjab, Haryana, Maharashtra etc.
  - Increase in disposable money and easy availability of drugs has led to increase in its use.

Fight against drug menace – India's regulatory framework

- **Article 47 of the Indian Constitution**
  - The National Policy on Narcotic Drugs and Psychotropic Substances is based on the Directive Principles, contained in Article 47 of the Indian Constitution.
  - The Article directs the State to endeavour to bring about prohibition of the consumption, except for medicinal purposes, of intoxicating drugs injurious to health.
- **Signatory to international conventions**
  - India is a signatory to:
    - the single Convention on Narcotic Drugs 1961, as amended by the 1972 Protocol, the Conventions on Psychotropic Substances, 1971 and the UN Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances, 1988.
- **Existing Laws**
  - The broad legislative policy is contained in the three Central Acts:
    - Drugs and Cosmetics Act, 1940,
    - NDPS Act, 1985, and
    - The Prevention of Illicit Traffic in Narcotic Drugs and Psychotropic Substances Act, 1988.
- **Institutions involved**
  - **Narcotics Control Bureau (NCB)** was created in 1986 as a nodal agency to fight against this menace.
  - Ministry of Health and Family Welfare (MoHFW) and Ministry of Social Justice and Empowerment (MSJE) are involved with alcohol and drug demand reduction policies and drug de-addiction programme.
  - In order to prevent misuse of dual-use drugs, a **permanent inter-ministerial committee** has been formed with the ministry of health and family welfare and the ministry of chemicals.
- **Technological intervention**
  - The NCORD (Narco Coordination Centre) portal has been launched as an effective mechanism for information exchange between various institutions/agencies.
  - A toll-free helpline called **MANAS (Madak Padarth Nishedh Asuchna Kendra)** with the number 1933 has been launched.
- **Other measures**
  - The government aims to achieve **drug-free India by 2047** through a 3 points strategy - strengthening of institutional structure, coordination among all narco agencies and extensive public awareness campaign.
  - As part of this strategy a number of steps have been taken which includes:
    - Establishment of a dedicated Anti-Narcotics Task Force (ANTF) in each state/UTs.
    - High priority to Drug Disposal drive.
    - **Launch of NIDAAN Portal** for Narco offenders.
    - Creation of canine squads for drug detection.
    - Strengthening the forensic capabilities.
    - Establishment of Special NDPS Courts and Fast Track Courts.
    - **Nasha Mukt Bharat Abhiyan** (NMBA) for generating Awareness against drug Abuse.

6. India To Be Free of Naxalism By 2026

Why in news?

Union Home Minister Amit Shah declared that the final battle against Maoists is imminent and will be ruthless, with the goal of eradicating Left-Wing Extremism (LWE) in India by March 2026.

After a meeting in Raipur with officials from Chhattisgarh and neighboring states, the minister emphasized the need for a strong strategy to deliver a decisive blow to LWE, which he described as the biggest challenge to India's democracy.

Left Wing Extremism (LWE)

- Left-wing extremism is the **single internal security threat that affects the largest number of States in India**.
- **LWE aims to overthrow the existing democratic state structure with violence as their primary weapon, and mass mobilization and strategic united fronts as complementary components.**

- o They plan to usher in So-called 'New Democratic Revolution' in India.
- Left-wing extremists are popularly known as Maoists worldwide and as Naxalites in India.

Reasons for the spread of LWE
- **Land Related Factors:**
  - o Encroachment and occupation of Government and Community lands (even the water-bodies) by powerful sections of society.
  - o Lack of title to public land cultivated by the landless poor.
  - o Poor implementation of laws prohibiting the transfer of tribal land to non-tribals in the Fifth Schedule areas.
  - o Non-regularisation of traditional land rights.
- **Displacement and Forced Evictions:**
  - o Eviction from lands traditionally used by tribals.
  - o Displacements caused by irrigation and power projects without adequate arrangements for rehabilitation.
  - o Large scale land acquisition for 'public purposes' without appropriate compensation or rehabilitation.
- **Livelihood Related Causes:**
  - o Lack of food security – corruption in the Public Distribution System
  - o Disruption of traditional occupations and lack of alternative work opportunities.
  - o Deprivation of traditional rights in common property resources.
- **Social Exclusion:**
  - o Denial of dignity.
  - o Continued practice, in some areas, of untouchability in various forms.
  - o Poor implementation of special laws on prevention of atrocities, protection of civil rights and the abolition of bonded labour etc.
- **Governance Related Factors:**
  - o Corruption and inadequate provision/non-provision of essential public services including primary health care and education.
  - o Misuse of powers by the police and violations of the norms of law.
  - o Perversion of electoral politics and unsatisfactory working of local government institutions.

Current LWE situation in India
- **Maoist violence came down**
  - o **According to the Ministry of Home Affairs:**
    - ▪ Maoist violence in the country has gone down by 77% since 2010;
    - ▪ The number of resultant deaths (security forces + civilians) has come down by 90 % from the all-time high of 1,005 in 2010 to 98 in 2022.
- **Number of districts declared to be Naxal-affected**
  - o The government has cut the number of districts declared to be Naxal-affected from over 200 in the early 2000s to just 90 now.
  - o It claims that the geographical spread of violence is actually restricted to just 45 districts.
    - ▪ According to the MHA, the arc of violence has been considerably restricted with just 25 districts accounting for 90% of the LWE violence.
  - o The presence of Naxals is said to be minimal to zero in Andhra Pradesh, Telangana, Odisha, Jharkhand, and Bihar, which were at one time their strongholds.

Response by Centre
- **Different schemes to support LWE states**
  - o **Security Related Expenditure (SRE)** - focuses on equipping security forces to fight Maoists;
  - o **The Special Infrastructure Scheme** (SIS) - aims to strengthen local police and intelligence set ups;
  - o **Special Central Assistance** for building infrastructure such as roads in LWE districts.
- **Massive presence of the CRPF**
  - o The Centre has maintained a massive presence of the CRPF in the affected states for almost two decades.
- **Erection of mobile towers**

- o Centre is pushing for the erection of mobile towers in the interiors, which would help the local people connect with the mainstream, and also generate technical intelligence.
- **Maoists sympathisers on the radar of Centre**
  - o The Centre has also unleashed the counter-terrorism National Investigation Agency (NIA) and the Enforcement Directorate on CPI(Maoist) cadres, leaders, and sympathisers with the aim to choke their funding.

India To Be Free Of Naxalism By 2026

- **About the news**
  - o Union Home Minister Amit Shah has set a target to eliminate Maoist activities in India by March 2026.
  - o He emphasized the need for a strong and ruthless strategy for the final assault against these groups.
- **Decline in Maoist violence**
  - o The minister highlighted the significant decline in Maoist violence over the past decade, with incidents dropping by 53% and related deaths by 70%.
  - o The number of LWE-affected districts has decreased from 96 to 45, and the number of LWE-hit police stations has reduced from 495 to 176.
- **Factors behind this decline**
  - o The minister noted the government's efforts to address the security vacuum in LWE-affected areas through coordinated operations and development work.
  - o He credited the joint efforts of state and Central Armed Police Forces, the National Investigation Agency, and the Enforcement Directorate for their role in combating Maoist extremism.
  - o The Home Ministry's LWE Division, established in 2006, plays a crucial role in this effort, monitoring the situation and implementing countermeasures.

7. The Road to 2047 for Indian Agriculture

Context
- India's centennial year of independence in 2047 marks an ambitious milestone, **with the goal of becoming a developed nation and a crucial aspect of achieving this status involves a significant transformation of the agricultural sector.**
- This **transformation is not just about enhancing productivity, but also about adopting sustainable practices** to ensure long-term environmental health and economic stability.
- **As India strives to increase its per capita Gross National Income (GNI) to six times the current level, the agricultural sector**, which employs nearly 46% of the workforce, **plays a pivotal role in this journey.**

A Closer Examination of Challenges in Agricultural Sector
- **Climate Change and Environmental Stress**
  - o The **increasing frequency of extreme weather events** such as unseasonal rains, droughts, floods, and heatwaves severely **impacts crop yields and agricultural productivity.**
  - o For example, **the 0.7% growth in agri-GDP in 2023-24 was primarily due to unseasonal rains,** which damaged crops and reduced yields.
- **Land Degradation and Fragmentation**
  - o **Overuse of land for agricultural purposes,** coupled with deforestation and unsustainable farming practices, **has led to significant soil erosion**, loss of arable land, and declining soil fertility.
  - o This **not only reduces the land's productive capacity but also increases the cost of farming**, as more inputs are required to maintain yields.
  - o **Fragmentation of agricultural land due to inheritance laws and population growth further compounds the problem.**
  - o As land is divided among heirs, **the average size of farms decreases, making it challenging to achieve economies of scale.**
- **Market Access and Price Realisation**
  - o **Despite the introduction of initiatives like the Electronic National Agriculture Market (eNAM)**, many **farmers still face difficulties in accessing markets** where they can sell their produce at fair prices.

- o The **integration of 1,361 mandis into eNAM by September 2023 is a positive step**, but it only covers a fraction of the agricultural markets in the country.
- o **Farmers often rely on traditional, local markets where they are subject to middlemen** who take a significant portion of the profits, leaving the farmers with low returns.
- o The **lack of infrastructure, such as roads, storage facilities, and transport systems, further exacerbates this issue,** as farmers are unable to store their produce for better prices or transport it to more lucrative markets.
- **Financial Challenges and Risk Management**
  - o **Many farmers are trapped in a cycle of debt due to high input costs**, low productivity, and fluctuating market prices.
  - o **The Pradhan Mantri Fasal Bima Yojana (PMFBY) has been instrumental in providing financial assistance to farmers in the event of crop losses,** with claims totalling over ₹1.45 lakh crore since its inception.
  - o However, **the scheme's effectiveness is often hampered by delays in claim settlements**, inadequate coverage, and challenges in assessing crop damage.

Analysis of Population Growth, Food Demand and the Imbalance of Contribution to the GDP
- **Population Growth and Food Demand**
  - o India's population is **projected to reach 1.5 billion by 2030 and 1.59 billion by 2040**, according to United Nations projections.
  - o This **increasing population will place immense pressure on the agricultural sector** to meet the growing food demand.
  - o With an estimated expenditure elasticity of food at 0.45, **the demand for food is expected to grow by approximately 2.85% annually,** considering the population growth rate of 0.85%.
  - o India's **real per capita income increased by 41% from 2011-12 to 2021-22** and is projected to accelerate further.
  - o However, **the expenditure elasticity post-2023 is anticipated to be lower**, correlating a 5% rise in per capita expenditure to a 2% growth in demand.
  - o The **anticipated food demand will vary among commodities, with meat demand growing by 5.42%** and **rice demand by a mere 0.34%.**
- **The Imbalance: Agriculture Contribution to the GDP**
  - o A stark imbalance exists in the Indian economy, **where agriculture employs nearly 46% of the workforce but contributes only about 18% to the GDP.**
  - o If current growth trends continue, this disparity will only worsen. Since 1991-92, while the overall GDP has grown at an annual rate of 6.1%, agricultural GDP has lagged at 3.3%.
  - o **Under the Narendra Modi administration, overall GDP growth was 5.9%, while agriculture grew at a modest 3.6%**.
  - o This **growth is insufficient for a sector that is so critical to the nation's socio-economic fabric.**
  - o **By 2047, the share of agriculture in GDP might shrink to 7%-8%,** yet it could still employ over 30% of the workforce if significant structural changes are not implemented.
  - o The anticipated 7.6% overall GDP growth for 2023-24 is promising, but **the anaemic growth of 0.7% in the agri-GDP, primarily due to unseasonal rains, is alarming.**

Government Initiatives to Boost Agricultural Growth
- **The Pradhan Mantri Kisan Samman Nidhi (PM-KISAN)**
  - o The PM-KISAN, **launched in 2019, disburses ₹6,000 annually to farmers in three instalments.**
  - o This scheme has already benefited over 11.8 crore farmers, offering much-needed financial support.
- **Soil Health Card (SHC) Scheme**
  - o Another critical initiative, the SHC scheme, **aims to optimise soil nutrient use, thereby enhancing agricultural productivity.**
  - o Over **23 crore SHCs have been distributed**, providing farmers with crucial insights into soil health and nutrient management.
- **Promotion of Nutritious Coarse Grains and Agricultural Infrastructure Fund**
  - o The **government also championed the International Year of Millets in 2023,** promoting nutritious coarse grains, both domestically and internationally.

- o **The Agriculture Infrastructure Fund, with a ₹1 lakh crore financing facility**, supports the **development and modernisation of post-harvest management infrastructure.**
- o Within three years, **over 38,326 projects have been sanctioned, mobilising ₹30,030 crore in the agricultural infrastructure sector.**
- o These **projects have created employment for more than 5.8 lakh individuals** and improved farmer incomes by 20%-25% through better price realisation.
- **Survey of Villages and Mapping with Improvised Technology in Village Areas (SVAMITVA)**
  - o Moreover, the SVAMITVA initiative **aims to ensure transparent property ownership in rural areas.**
  - o As of September 2023, **over 1.6 crore property cards have been generated**, enhancing land security, and facilitating credit access for farmers.

Government's Strategic Planning Towards the Vision for 2047 and the Balanced Path Forward
- **Strategic Planning**
  - o The government's strategic planning for agriculture, leading up to 2047, **focuses on several key areas:** anticipated future demand for agricultural products, insights from past growth catalysts, existing challenges, and potential opportunities in the agricultural landscape.
  - o **Projections indicate that the total demand for food grains in 2047-48 will range from 402 million tonnes to 437 million tonnes**, with production anticipated to exceed demand by 10%-13% under the Business-As-Usual (BAU) scenario.
- **The Balanced Path Forward**
  - o However, to meet this demand sustainably, **significant investments in agricultural research, infrastructure, and policy support are required.**
  - o The **Budget for 2024-25, with an allocation of ₹20 lakh crore for targeted agricultural credit** and the launch of the Agriculture Accelerator Fund, **highlights the government's proactive approach to creating agricultural innovation and growth.**

Conclusion
- **By embracing sustainable practices,** leveraging technological innovations, and implementing strategic initiatives, **India can enhance farmer incomes, meet the food demands of its growing population, and achieve inclusive, sustainable development.**
- The **road to 2047 will require a concerted effort to address the existing challenges, correct the imbalances in the economy, and ensure that the agricultural sector receives the support it needs** to thrive in the coming decades.
- With **careful planning and robust policy interventions, India can transform its agricultural landscape,** paving the way for a prosperous and developed nation by 2047.

8. Discussion on E-commerce Sector in India

Why in News?

Aiming at the largest online retailer in the world - Amazon, the Union Minister of Commerce and Industry voiced concerns about the rapid expansion of the e-commerce sector in India.

What is E-commerce?
- **Meaning:** E-commerce (electronic commerce) is the buying and selling of goods and services, or the transmitting of funds or data, over an electronic network, primarily the internet.
- **Advantages:**
  - o **No geographical barrier:** Delivery of products is taking place in the remotest part of the country, which has brought suppliers and customers closer together - boosting output and creating ideal competition.
  - o **Lower cost:** Due to decrease in miscellaneous expenses and increase in economy of scale, cost of the products also gets reduced.

- o **Personalization and product recommendation:** Customers can learn more about the products thanks to the feedback and remarks system.
  - o **For business:** Advantages include an expanded customer base, increased sales, extended business reach, and the convenience of recurring payments and instant transactions.
- **Disadvantages:**
  - o **Security and privacy issues:** The general acceptance of e-commerce buying habits is hampered by the lack of strong encryption techniques to protect identification, personal data, and financial transactions.
  - o **Limited customer service:** Compared to e-commerce websites, physical storefronts make it easier to resolve concerns and determine whether a product is suitable.
  - o **Regulatory concerns:** The lack of clarity regarding the laws governing online sales creates mistrust between consumers and sellers.
  - o **Limited understanding of product suitability:** Buying things online eliminates the opportunity to physically handle them. Instead, one must rely exclusively on digital photos.
  - o **There is lesser accountability on part of e-commerce companies:** The product quality may or may not meet the expectations of the customers.

Key Factors Promoting the Growth of E-Commerce in India:
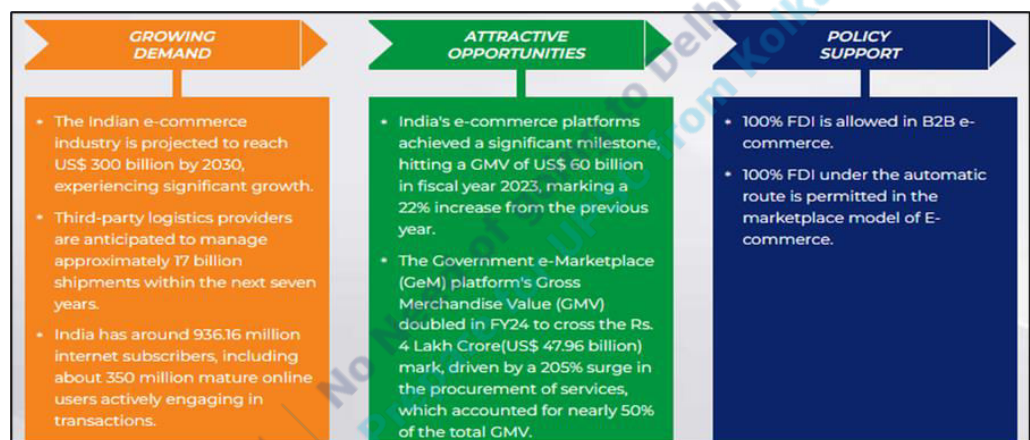
- **Price - A trump card for Indian e-commerce players:** As most of the products that are available online are cheaper than the same products available offline.
- **Payment options:**
  - o The Government of India's **Digital India** initiative has been a key factor in enhancing internet penetration across the country.
  - o With the advent of digital wallets and **UPI** (Unified Payments Interface), the payment options have grown over the years.
  - o However, the **Cash on Delivery (COD)** is prevalent in India due to a large amount of cash being circulated in the economy.
- **Domestic consumption:** India's growth story driven by domestic demand and the high consumption of the aspirational Indian consumer has ensured the growth of e-commerce.
- **Language:** Most e-commerce portals in India are in English and that has played a big role in the growth of the industry, as India has the largest English-speaking middle-class population.

Government Initiatives to Promote E-commerce in India:
- Since 2014, initiatives like **Digital India, Make in India, Start-up India, Skill India, and Innovation Fund** have supported the growth of E-commerce in the country.
- **Government e-Marketplace (GeM):** It is an online platform for public procurement in India that was launched in 2016 by the Ministry of Commerce and Industry.
  - o Its objective is to create an inclusive, efficient, and transparent platform for the buyers and sellers to carry out procurement activities in a fair and competitive manner.
- **National Retail Policy:** In order to administer offline retail and e-commerce in an integral manner, the government had identified five areas in its proposed national retail policy -
  - o Ease of doing business,
  - o Rationalisation of the licence process,
  - o Digitisation of retail,
  - o Focus on reforms and
  - o An open network for digital commerce (ONDC).

- **ONDC:**
  - o It has been built to promote open networks for all aspects of the exchange of goods and services over digital or electronic networks.
  - o It uses open specifications and open network protocols independent of any specific platform.
    - **The Consumer Protection (e-commerce) Rules 2020:** It directed e-commerce companies to display the country of origin alongside the product listings.
      - o In addition, the companies will also have to reveal parameters that go behind determining product listings on their platforms.
    - **5G:** Heavy investment made by the Government in rolling out a fibre network for 5G will help boost E-commerce in India.

Concerns Regarding E-Commerce Sector in India:
- According to a Pahle India Foundation's report 'Net Impact of E-Commerce on Employment and Consumer Welfare in India',
  - o E-commerce is growing at an annual rate of **27%**, meaning that e-commerce **will double every three years.**
  - o Online vendors have **generated 15.8 million jobs** in India (including 3.5 million for women), with about 1.76 million retail enterprises participating in e-commerce activity.
- The Union Minister of Commerce and Industry (at the launch of the report) claimed that this growth of the e-commerce sector in India would be the consequence of "**predatory pricing**".
  - o **Predatory pricing is a practice** (generally by a new player in the market) of keeping prices superficially low to undercut competition and gain market share.
  - o He singled out **Amazon** for indulging in predatory pricing and selling products directly to consumers even though it isn't allowed to do so.
- According to the minister, this might cause "**social disruption**" because it would **negatively affect an estimated 100 million small retailers nationwide.**

9. Steady in the Storm: 25 Years After It Was Drafted, Why India's Nuclear Doctrine Still Remains Relevant

Context
- **In the aftermath of the Pokhran II nuclear tests in 1998, India moved swiftly to draft its nuclear doctrine**, underscoring its vision as a nuclear weapons state.
- **On August 17, 1999, the National Security Advisory Board, led by K. Subrahmanyam, presented a draft of this doctrine** to the then National Security Advisor.
- **After 25 years, it is crucial to examine the historical context, evolving security threats, and ongoing relevance of India's nuclear doctrine**, arguing that it remains a beacon of stability despite the changing global and regional security landscape.

Historical Context and Core Principles of India's Nuclear Journey and Need for a Doctrine
- **India's Entry into the Nuclear Club**
  - o India's journey toward becoming a nuclear weapons state culminated with the **Pokhran II tests in May 1998, a significant milestone** that demonstrated its capability and resolve.
  - o These tests, **conducted under a shroud of secrecy, marked India's entry into the exclusive club of nuclear-armed states.**
  - o However, **the tests were not just about showcasing technological prowess; they were a strategic signal to the world**, especially to neighbouring Pakistan and China, about India's readiness to defend its sovereignty.
- **International Response and the Need for a Doctrine**
  - o The global community, **particularly Western powers, viewed India's nuclear ambitions with suspicion and concern.**
  - o **It was within this context that India needed to articulate a clear and responsible nuclear doctrine** that would allay fears of a potential arms race in South Asia, while simultaneously asserting its right to self-defence.

- o The **development of a draft nuclear doctrine was a response to this necessity.**

An Analysis of the Components of India's Draft Nuclear Doctrine and Evolving Threat Landscape
- **The Draft Doctrine: Transparency and Democratic Ethos**
  - o **On August 17, 1999,** Subrahmanyam, a prominent strategist and the convenor of the first National Security Advisory Board (NSAB), **presented the draft nuclear doctrine.**
  - o This **document was significant for several reasons.** Firstly, it was one of the few instances where **a nuclear weapons state publicly shared its nuclear strategy** before finalising it, reflecting a commitment to transparency.
  - o **Secondly, by making the draft public**, the Indian government, led by PM Vajpayee, **sought to ensure that the doctrine would be thoroughly debated and understood,** both domestically and internationally, before it was officially adopted.
  - o This **move was in line with India's democratic ethos**, where major policy shifts are subject to public discourse and scrutiny.
- **Conceptualising Nuclear Weapons as Political Instruments**
  - o The draft doctrine laid out the foundational principles that would guide India's nuclear policy.
  - o **Central to these principles was the conceptualisation of nuclear weapons** as primarily political instruments, rather than tools of warfighting.
  - o This **perspective was rooted in the belief that nuclear weapons, by their very nature, are weapons of mass destruction** that should be used solely for deterrence and not for actual combat.
  - o The **doctrine emphasised that India's nuclear weapons were intended to deter aggression,** particularly nuclear aggression, by maintaining a credible minimum deterrent.
  - o This **meant that India would build and maintain a nuclear arsenal that was sufficient to inflict unacceptable damage on an adversary** in the event of a nuclear attack, thereby deterring such an attack in the first place.
- **The No-First-Use Policy: A Reflection of Restraint**
  - o This **policy stated that India would not be the first to initiate a nuclear strike but would retaliate massively** if attacked with nuclear weapons.
  - o The **NFU policy reflected India's strategic culture**, which has traditionally been marked by restraint and non-aggression.
  - o **By committing to NFU, India sought to position itself as a responsible nuclear power,** one that would use nuclear weapons only in retaliation and not as a tool of coercion.
- **Building a Diverse and Flexible Nuclear Force**
  - o The **draft doctrine also advocated for a nuclear force that was effective, enduring, diverse, flexible, and responsive.**
  - o This **implied that India's nuclear arsenal would be designed to survive a first strike and retaliate effectively**, ensuring that any adversary contemplating a nuclear attack would be deterred by the certainty of a devastating response.
  - o The **emphasis on diversity and flexibility highlighted the need for a mix of delivery systems, including land-based missiles, aircraft, and sea-based platforms**, to ensure the survivability and credibility of India's deterrent.
- **Evolving Threat Landscape**
  - o The **security environment in South Asia has evolved since the doctrine's conception.**
  - o Pakistan's frequent assertions of its full spectrum deterrence and China's rapid expansion of its nuclear capabilities pose significant challenges.
  - o **Pakistan's use of cross-border terrorism and China's increasingly assertive behaviour have emerged as primary security threats** for India.
  - o The possibility of these two nuclear-armed neighbours collaborating against India further complicates the strategic calculus.

Criticisms of Draft Doctrine and Reasons Why India Does Not Need to Abandon the Core Principles of Draft Doctrine
- **The Debate on No-First-Use Policy**
  - o **Critics argue that this policy is overly reactive** and cedes strategic initiative to adversaries, particularly considering Pakistan's and China's aggressive postures.
  - o **Some advocate for adopting a first-use strategy** or at least maintaining strategic ambiguity to keep adversaries uncertain.

- o **However, this argument falters when scrutinised** because **a credible first-use strategy would necessitate an extensive and sophisticated nuclear arsenal**, capable of delivering a disabling strike on an adversary's nuclear forces.
- o This **would require significant investments in accurate delivery systems, ISR capabilities, and ballistic missile defences**—none of which would come easily or cheaply.
- o Moreover, **the risk of miscalculation and escalation inherent in a first-use policy could lead to catastrophic consequences,** particularly against adversaries with robust second-strike capabilities.
- **Debate on Tactical Nuclear Weapons and Escalation Control**
  - o The **draft doctrine has also faced criticism for not explicitly incorporating the use of tactical nuclear weapons as a means of deterrence.**
  - o Proponents of this view argue that tactical nuclear weapons, with their purported ability to achieve limited destruction, could provide a more credible deterrent.
  - o However, **the very nature of nuclear weapons makes the concept of 'limited destruction' highly dubious**.
  - o **Even a so-called tactical use could quickly escalate into full-scale nuclear conflict**, with unpredictable and devastating consequences.

Way Forward: Measures to Enhance the Survivability and Resilience of India's Nuclear Arsenal
- Beyond the quantitative aspects of nuclear deterrence, **recent technological advancements by adversaries necessitate a closer examination of India's nuclear strategy.**
- **These include improvements in conventional delivery systems, cyber capabilities targeting nuclear command and control**, and advances in intelligence, surveillance, and reconnaissance (ISR).
- **Such developments could make India's nuclear forces more vulnerable to a first strike,** underscoring the need to enhance the survivability and resilience of its nuclear arsenal.
- **However, these technological challenges do not inherently require a change in the core principles** of India's nuclear doctrine.
- Instead, **they call for an adaptation in numbers and command structures to ensure the continued effectiveness of the deterrence.**
- The emphasis remains on maintaining a credible second-strike capability, rather than shifting towards a first-use policy or altering the foundational doctrine.

Conclusion
- While the evolving security landscape and technological advancements necessitate ongoing adaptations in India's nuclear force structure and capabilities, **the core principles of its nuclear doctrine remain sound.**
- **India's nuclear policy is a pillar of stability in an increasingly volatile world, providing a measured and responsible approach to nuclear deterrence** that contrasts sharply with the aggressive postures of some of its adversaries.

10. Government Initiatives to Bolster Domestic Clean Technology Manufacturing and its Implications

Why in News?
The Ministry of New and Renewable Energy (MNRE) reimposed its mandate requiring solar projects to source (photovoltaic [PV]) modules exclusively from a government-approved list of domestic manufacturers starting April 1. This comes amid concerns over market concentration in India's solar PV module industry and its potential to drive-up household electricity tariffs.
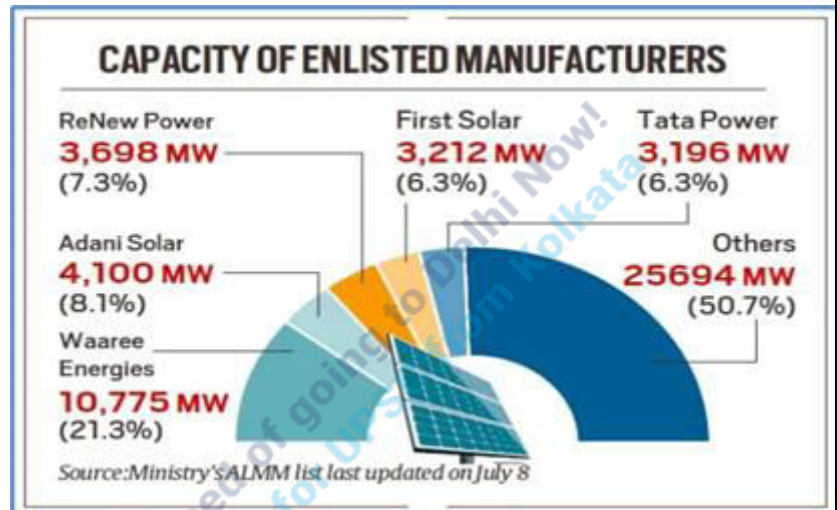
Government Initiatives to Bolster Domestic Clean Technology Manufacturing:
- **The ALMM (Approved List of Model Manufacturers):**
  - o Issued by the MNRE in 2021, it mandates all government-assisted or associated solar projects **to use only enlisted modules**, effectively barring the use of imported modules in most projects.
  - o The order aims to **enhance energy security by reducing import dependence.**
  - o **The order was reimposed recently because** the enlisted capacity of around 50 GW is believed to be sufficient and the duty-free import of solar modules from ASEAN countries is detrimental to domestic producers.

- **The Production Linked Incentive (PLI) scheme for solar PV modules:** Till now, the MNRE has announced incentives for 48.3 GW of module manufacturing capacities under the PLI scheme.

Implications of Market Concentration in India's Solar PV Module Industry:
- **Positive:**
  - The BCD (Basic Custom Duty of 40% on solar module imports) will help g**row the consumption demand** of domestically manufactured products.
  - Manufacturers anticipate a multifold increase in solar panel installations due to the **PM-Surya Ghar Muft Bijli Yojana's** goal of installing one crore household rooftop solar panels.
  - Furthermore, solar panel manufacturers are also hoping for **a policy change in European countries** on the lines of the US which may open the European market for India.
- **Negative:**
  - **Companies linked to just five manufacturers** control nearly half of the current capacity listed on the ALMM.
  - Domestic solar modules are now **90% more expensive than imports**, with prices reaching 18 cents per watt compared to 9.1 cents for imported modules.

CAPACITY OF ENLISTED MANUFACTURERS

ReNew Power **3,698 MW** (7.3%)

First Solar **3,212 MW** (6.3%)

Tata Power **3,196 MW** (6.3%)

Adani Solar **4,100 MW** (8.1%)

Others **25694 MW** (50.7%)

Waaree Energies **10,775 MW** (21.3%)

Source: Ministry's ALMM list last updated on July 8

India's Renewable Energy Prospects:
- **Current situation:**
  - It should be mentioned that India is the **3rd** largest energy consuming country and stands **4th** for total renewable power capacity additions.
  - As of (May) 2024, India's renewable energy capacity stands at **195.01 GW** with solar power capacity of 85.47 GW, wind power of 46.65 GW, small hydro power of 5 GW and large hydro power of around 46 GW.
  - At COP26 India announced its plan to achieve the target of **500GW** of non-fossil fuel-based energy by 2030.
- **Future projections:**
  - India's power consumption is growing at around 10%-12% per annum resulting in an additional power demand of 20-25 GW annually.
  - This increasing demand combined with the government initiatives may create a multi fold increase in the demand for solar installations.
- **Challenges:**
  - In order to reach the 2030 target, **India needs to add about 44 GW annually**, requiring an **investment of US$ 190-215 billion** over seven years.
    - According to the Ministry of Commerce & Industry data, the total solar capacity installed in FY 24 was around 15 GW this far.
  - **Land acquisition** and infrastructure development to establish an **efficient transmission network** are the major challenges that the industry and the government need to address.
  - **India's per capita power consumption** is only around one third of the global average.

11. Reshape the Governance Structures of AI Companies

Context
- **Corporate governance in capitalistic and neo-capitalistic economies has historically prioritised the theory of shareholder** primacy and this model places the goals of profit generation and wealth creation for shareholders above other business objectives.
- However, **recent years have seen a growing movement toward stakeholder capitalism, which seeks to balance the interests of all stakeholders**, including employees, customers, and society at large.

- It is important to **explore the shifting landscape of corporate governance in the context of AI development, examining the challenges and opportunities** presented by stakeholder capitalism.

The Traditional Model: Shareholder Primacy and the Rise of Stakeholder Capitalism

- **The Traditional Model: Shareholder Primacy**
  - The **shareholder primacy model has dominated corporate governance for decades,** driven by the belief that the primary responsibility of a corporation is to maximise profits for its shareholders.
  - This **perspective was famously articulated by economist Milton Friedman in 1970**, who argued that the social responsibility of business is to increase its profits.
  - **Under this model, other objectives,** such as social or environmental considerations, **are secondary to the goal of financial gain.**
  - This **approach has shaped the decision-making processes of countless corporations**, leading to a focus on short-term profits and shareholder returns.
- **The Rise of Stakeholder Capitalism**
  - In contrast to shareholder primacy, **the stakeholder benefit approach to corporate governance advocates for maximising the benefits of all stakeholders**, not just shareholders.
  - **This model recognises that businesses operate within a broader social and environmental context** and that their actions can have far-reaching consequences.
  - The **rise of stakeholder capitalism reflects a growing awareness that corporations have a responsibility to contribute to the public good**, not just to generate profits.
  - This **shift has been particularly evident in industries where the social impact of products and services is significant,** such as the development of AI technologies.

The Need for Alternative Governance Structures for AI Companies

- **The Intrinsic Nature of AI**
  - **AI, especially Generative AI, is fundamentally different from traditional technologies** in that it learns and evolves by processing vast amounts of data.
  - This capability **allows AI systems to generate new content, make decisions, and even predict human behaviour.**
  - However, **this same capability raises significant concerns about the potential for misuse**, bias, and unintended consequences.
  - **Traditional governance models, which prioritise shareholder profits, often overlook these risks** in favour of short-term financial gains.
- **Social and Ethical Implications of AI**
  - **AI technologies are increasingly embedded in critical aspects of daily life**, from healthcare and finance to education and social media.
  - As such, **the decisions made by AI systems can have wide-ranging implications** for individuals and society.
  - **One of the most pressing concerns is the potential for AI to perpetuate and even exacerbate existing social biases** and inequalities.
  - **For example, Amazon's experience with its AI-driven recruiting algorithm highlights how AI can unintentionally embed and amplify gender biases** present in historical data.
  - The **ethical implications of AI extend beyond bias. There is also the concern of AI systems making decisions that affect individuals' lives** without sufficient transparency or accountability.
- **Public Scrutiny and Regulatory Pressures**
  - As AI becomes more pervasive, **there is increasing public scrutiny of how these technologies are developed and deployed.**
  - **Stakeholders, including consumers, employees, and advocacy groups, are demanding greater accountability from corporations** that develop AI technologies.
  - They are **calling for governance structures that prioritise ethical considerations** and protect public interests over mere profit-making.
  - **Regulatory bodies around the world are also responding to the challenges posed by AI**.
  - For example, **the European Union has proposed the Artificial Intelligence Act,** which seeks to regulate AI technologies by imposing strict requirements on high-risk AI systems.

- **The Emergence of Alternative Governance Structures**
  - **In response to these challenges, some corporations are experimenting with alternative governance structures** that aim to balance the profit motive with broader social responsibilities.
  - **One such example is the creation of public benefit corporations,** which are legally required to consider the impact of their decisions on all stakeholders, not just shareholders.
  - **OpenAI and Anthropic, two leading AI firms, have adopted such models** to align their business practices with their ethical commitments.
  - **OpenAI, for instance, was initially founded as a non-profit organisation** with the mission of ensuring that AI benefits all of humanity.
  - However, **as the company grew and its need for capital increased, it transitioned to a hybrid structure** with a capped-profit subsidiary.
  - This **structure allows OpenAI to attract investment** while still maintaining its focus on public benefit.

The Path Forward: A Workable Strategy for Ethical AI Development
- To address the challenges posed by the intersection of AI development and corporate governance, **policymakers must develop innovative regulatory frameworks** that balance the interests of profit and social responsibility.
- **This could involve enhancing the long-term profit potential of companies that adopt public benefit purposes,** incentivising managerial compliance with these objectives, and reducing the costs associated with such compliance.
- **Additionally, establishing ethical standards for AI governance and providing regulatory support through corporate governance reforms will be crucial** in promoting the responsible development of AI technologies.

Conclusion
- **The evolution of corporate governance in the age of AI reflects a broader shift from shareholder primacy** towards stakeholder capitalism.
- **While this transition is still in its early stages, it is clear that the development of AI technologies presents both significant challenges and opportunities** for businesses.
- **By adopting innovative regulatory approaches and ethical standards, it is possible to create a framework that promotes both the responsible development of AI** and the long-term success of businesses in the technological age.

12. Disinformation, AI and Cyber Chakravyuh

Context
- The year **2024 has emerged as a period marked by an escalating sense of threats**, concerning global security.
- **With the rapid advancement of Artificial Intelligence (AI)** and its many manifestations, including Generative AI and Artificial General Intelligence (AGI), **security specialists worldwide have been bracing for an unprecedented wave of attacks.**
- The **spectrum of these threats extends beyond traditional cyber threats** to include the expanding horizons of disinformation, all of which contribute to a distinctly grim outlook for the future.

The Danger Posed by AI in 2024
- **The Threats Surrounding the 2024 Summer Olympic Games**
  - **One of the major concerns in 2024 was the 33rd Summer Olympic Games in France**, held during July and August.
  - These **Games were seen as an attractive target for various digital criminals**, including cyber attackers.
  - The **anticipation of digital assaults of a kind never encountered before was profound** among experts.
  - Despite the Paris Games concluding peacefully without any significant incident, **the absence of a major attack has not alleviated the ongoing fears.**
  - **Security agencies remain on high alert**, fully aware that vigilance is the price they must pay to ensure safety in this new digital age.
- **Disinformation and AI-Generated Deep Fakes during Taiwanese Elections**

- o The **year began with a surge in disinformation, particularly in the context of the Taiwanese elections in January.**
- o The atmosphere was rife with fake posts and videos, leading to widespread confusion and chaos.
- o **While many attributed these actions to China, the reality is that AI has made it significantly easier to spread disinformation** disguised as truth.

The Evolution of Cyberattacks and their National Security Threat
- **Transformation of Isolated Incidents of Digital Mischief into Significant Threats**
  - o The evolution of cyberattacks has transformed them **from isolated incidents of digital mischief into significant threats with the potential to undermine national security.**
  - o In the context of 2024, **this threat has been exacerbated by the integration of AI technologies,** which have enhanced the sophistication, scale, and impact of these attacks.
  - o The **convergence of AI and cyber capabilities has created a new battlefield**, where the **traditional boundaries of warfare are blurred**, and the distinction between state and non-state actors becomes increasingly difficult to discern.
- **Vulnerability of Critical Infrastructure**
  - o At the heart of the national security threat posed by cyberattacks is the **vulnerability of critical infrastructure.**
  - o **In modern societies, essential services** such as electricity, water supply, telecommunications, and transportation **rely heavily on interconnected digital systems.**
  - o **These systems,** while enhancing efficiency and connectivity, **also present a significant point of vulnerability.**
  - o **Cyberattacks targeting these infrastructures can lead to widespread disruption**, economic loss, and even physical harm.
  - o The **conflict in Ukraine is a prime example of how cyber warfare can be used as a tool of statecraft to destabilise a nation**, disrupt critical services, and sow confusion and fear among the populace.
- **Economic Destabilisation and Broader Implications**
  - o In addition to the direct threat posed by cyberattacks on critical infrastructure, **there is also the risk of economic destabilisation.**
  - o **Financial markets, supply chains, and other key components** of the global economy are all **highly vulnerable to cyberattacks.**
  - o A **successful attack on these systems could trigger a cascading effect, leading to significant economic downturns** and undermining the stability of entire regions.
  - o This, in turn, **could create fertile ground for further conflict**, as nations struggle to cope with the economic and social fallout of such disruptions.
- **Undermining Public Trust in Government Institutions**
  - o Moreover, **cyberattacks have the potential to undermine public trust in government institutions.**
  - o **In democracies**, where the legitimacy of the government relies on the trust and confidence of the electorate, **a successful cyberattack that disrupts elections, manipulates public opinion, or exposes sensitive information could have far-reaching consequences.**
  - o The erosion of public trust could lead to political instability, social unrest, and a weakening of the nation's ability to respond to other security challenges.

The Role of AI in Cyberattacks and Ethical and Legal Considerations of AI-Enabled Cyber Threats
- **The Role of AI in Cyberattacks**
  - o AI has further complicated the cyber threat landscape by **enabling more sophisticated and automated attacks.**
  - o **AI algorithms can be used to scan networks for vulnerabilities**, launch attacks, and even adapt in real-time to countermeasures deployed by defenders.
  - o **This level of automation and adaptability makes AI-powered cyberattacks particularly dangerous**, as they can scale rapidly and cause extensive damage before being contained.
  - o Furthermore, **AI can be used to create highly convincing disinformation campaigns, which can be deployed in tandem with cyberattacks to amplify their impact** and create confusion and mistrust within a targeted population.
- **Ethical and Legal Considerations of AI-Enabled Cyber Threats**

- o As AI technologies become more integrated into national defence strategies, **there is a growing debate over the appropriate use of such technologies in warfare.**
- o **Issues such as the potential for collateral damage, the accountability of autonomous systems**, and the implications of AI-driven decision-making in life-and-death situations are **all areas of concern.**
- o **These ethical considerations further complicate the challenge of defending against cyber threats**, as nations must balance the need for effective defence with the responsibility to uphold international norms and human rights.

Microsoft Outage: A Preview of Potential Cyber Disasters
- **In June 2024, the world received a preview of the potential devastation** that could be caused by a massive cyberattack, whether AI-enabled or otherwise.
- **A 'glitch' in a software update concerning Microsoft Windows resulted in a massive outage** that initially affected parts of the United States before spreading globally, including to India.
- **This incident, while not a cyberattack, provided a sobering glimpse of the kind of disruption** that could occur in the event of a genuine cyber onslaught.
- **The scale of the disruption, affecting flight operations, air traffic, and stock exchanges, underscored the vulnerability** of global systems to such threats.

Way Forward
- **The Need for a Comprehensive Cyber defence Strategy**
  - o In response to these challenges, **nations must adopt a comprehensive and multi-layered approach to cyber defence.**
  - o **This includes not only the development of advanced technological solutions but also the strengthening of international cooperation** to share intelligence, coordinate responses, and establish norms of behaviour in cyberspace.
  - o **Public-private partnerships are also essential**, as most of the critical infrastructure is owned and operated by private entities.
  - o **Governments must work closely with these stakeholders to ensure that they have the necessary resources** and expertise to defend against cyber threats.
- **Training, Education and Awareness**
  - o **As cyber threats evolve, so too must the skills and knowledge** of those responsible for defending against them.
  - o **This requires ongoing investment in cybersecurity** training and the **development of a workforce capable of navigating the complexities of the modern threat landscape.**
  - o **It also means educating the public about the risks** and encouraging responsible behaviour online to reduce the likelihood of successful attacks.

Conclusion
- **The struggle against digital threats is not a battle that can be fought in isolation; it requires coordinated action** and a collective realisation that nations, particularly democracies, are under attack from a new and different source.
- **There is an urgent need to counter digital surveillance, disinformation, bullying, and manipulation** to ensure our survival in this increasingly digital world.
- **The year 2024 has shown us the extent of the threats we face, and it is imperative that we remain vigilant** and prepared for the challenges that lie ahead.

13. Five Years After End of Article 370, What is the Pakistan Hand in Kashmir

Context
- **On 5th August 2019, India made a significant constitutional change** regarding the status of Jammu and Kashmir (J&K) by abrogating Art 370 and Art 35A.
- This **move has had profound implications for the region and its relations with Pakistan**.

- Therefore, **it is important to examine whether this change rendered the Kashmir issue irrelevant to the engagement between India and Pakistan.**

The Aftermath of Abrogation of Article 370
- **India's Definite Stand on J&K's Status**
  - By ending the ambiguity surrounding J&K's relationship with India, **Delhi has firmly buried the notion that the internal status of the region is open-ended and negotiable.**
  - This **decisive action has established a clear stance that J&K is an integral part of India,** non-negotiable in any discussions.
  - **India's strengthening partnerships with Western nations** have further **blunted efforts by Pakistan and China to internationalise the Kashmir question,** making it less salient on the global stage.
  - However, **this does not mean the issue has disappeared from the bilateral conflict template between India and Pakistan.**
- **Continued Cross-Border Tensions**
  - Despite the constitutional change, **Pakistan's capacity to meddle in Kashmir remains undiminished.**
  - The **surge in cross-border terrorism, especially noticeable since the day Narendra Modi was sworn in for his third consecutive term as Prime Minister,** underscores the ongoing threat.
  - **Delhi is acutely aware of** the difference between **legal formalism on Kashmir and the practical reality of Pakistan's continued interference.**
- **Political Gains and Persistent Challenges**
  - Post abrogation of art 370, **parliamentary elections in Kashmir have demonstrated significant political gains for Delhi,** yet they also reveal the persistence of separatist sentiments.
  - **There is little room for complacency in Delhi,** as the domestic tasks in Kashmir remain substantial.
  - **While India can take credit for significantly reducing the global salience** of the Kashmir question, the **issue still poses challenges that require careful management.**

International Dimensions and Historical Context of the Kashmir Issue
- **Cold War Era and Geopolitical Alignments**
  - **During the Cold War, Kashmir was not just a bilateral issue** but also a **significant element in the broader geopolitical alignments.**
  - India, with its non-aligned stance, and Pakistan, as a key ally of the United States, found their Kashmir policies influenced by the global power dynamics.
  - **The strategic rivalry between the US and the Soviet Union often played out in the subcontinent**, with each superpower supporting its respective ally.
- **Shimla Agreement and Bilateralism**
  - **The 1971 war**, which led to the creation of Bangladesh, **was a turning point in the Kashmir conflict.**
  - The **subsequent Shimla Agreement in 1972 between India and Pakistan aimed to resolve issues bilaterally** and refrain from altering the Line of Control (LoC) unilaterally.
  - While this agreement was intended to limit third-party intervention, **it did not eliminate international involvement.**
  - The **Pakistan Army's disowning of the Shimla Agreement highlighted the fragility of bilateral resolutions** and the persistent international dimension of the Kashmir issue.
- **Insurgency and Internationalisation in the 1980s and 1990s**
  - The **late 1980s and 1990s saw a renewed insurgency in Kashmir**, which Pakistan supported both overtly and covertly.
  - This **period also witnessed a shift in the global environment post-Cold War**, with a heightened focus on human rights and the diminishing sanctity of state sovereignty.
  - **Pakistan leveraged these global trends,** pushing for international intervention by framing the Kashmir issue in terms of human rights abuses and self-determination.
  - **The frequent military crises during this period, particularly those involving cross-border terrorism, raised international alarm** due to the risk of nuclear escalation between two newly nuclear-armed states.
  - The **narrative of Kashmir as the world's most dangerous nuclear flashpoint gained traction, drawing significant attention from global powers** and international organizations.

- **US-India Relations and the Changing Global Order**
  - The **turn of the millennium brought a significant shift in the international dimension** of the Kashmir issue, primarily due to the evolving US-India relationship.
  - The **administration of President George W. Bush played a pivotal role in de-emphasising Washington's activism on Kashmir and instead focused on building a strategic partnership with India.**
  - This shift was crucial in resolving long-standing issues, such as the nuclear dispute with India, and reducing international pressure on Kashmir.
- **Post-2019 Scenario and China's Role**
  - **The abrogation of Article 370** in August 2019, which revoked the special status of Jammu and Kashmir, **was a decisive move by India that further complicated the international dimensions** of the Kashmir conflict.
  - **Pakistan's immediate reaction was to seek international intervention**, particularly from China, a close ally.
  - **China's interest in Kashmir is partly strategic, given its own territorial claims and its investments in the China-Pakistan Economic Corridor (CPEC),** which runs through Gilgit-Baltistan, a part of the larger Kashmir region claimed by India.

Economic, Diplomatic and Strategic Shift in India

- **Economic and Diplomatic Shifts**
  - **India's steady economic growth** and improved relationship with the US in the 2000s **helped overcome many challenges.**
  - The **George W. Bush administration put an end to Washington's Kashmir activism** and resolved the nuclear dispute with India.
  - However, **Pakistan's cross-border terrorism and its capacity to create political trouble in Kashmir remained significant problems.**
  - The **NDA government, coming to power with a clear objective** to renegotiate terms with Pakistan on Kashmir, aimed to enhance military deterrence, end engagement with militant groups, and **insist that talks and terror cannot coexist.**
  - Changing the constitutional status quo in August 2019 was the capstone of this strategy.
  - **Pakistan's outrage led it to turn to China to put the Kashmir question on the UNSC agenda,** but Delhi, with support from Washington and Paris, blocked the move.
  - **Support from the UAE and Saudi Arabia also helped prevent Pakistan from making it a significant issue** in the Islamic world.
- **India's Strategic Position**
  - **India's new partnerships in the West and the Islamic world** have **neutralised long-standing international support bases for Pakistan.**
  - The **steady evolution of the economic balance of power in favour of India,** whose GDP is nearly ten times that of Pakistan, has further diminished Rawalpindi's challenge.
  - **Pakistan's deepening political divisions and economic weakness have made its position less tenable.**

The Path Forward

- Despite these developments, **Delhi should not assume it can ignore Rawalpindi or that the Kashmir question is irrelevant.**
- The Pakistan army, though down, is not out. **Renewed political trouble in Kashmir will inevitably draw international attention.**
- Thus, **accelerating efforts at internal reconciliation in Kashmir, countering renewed cross-border terrorism, and engaging with diverse elements of the Pakistan polity should be the top priorities** for India's national security strategy.

Conclusion

- **The constitutional change in Kashmir** has significantly **altered the dynamics of India-Pakistan relations.**
- Though **it has rendered some aspects of the Kashmir issue less relevant**, it remains a critical factor in the bilateral engagement.
- Hence, the complex **interplay of domestic and international dimensions necessitates a nuanced and proactive approach from Delhi.**

14. Research & Development in India

Background:
- Research and Development (R&D) is carried out by companies and governments to create new products or services and improve existing ones.
- R&D includes activities that promote innovation, such as developing incubators, scaling innovations, and fostering an innovation-friendly environment within the sector.

Investment in R&D in India:
- According to the Department of Science and Technology's R&D statistics for 2022-23, **India's total investment in R&D reached $17.2 billion in 2020-21**.
- Of this amount, **54% ($9.4 billion) is allocated to the government sector**, primarily utilized by four major scientific agencies:
  - the Defence Research and Development Organisation (30.7%),
  - the Department of Space (18.4%),
  - the Indian Council of Agricultural Research (12.4%), and
  - the Department of Atomic Energy (11.4%).
- Government funding plays a crucial role, with significant allocations directed towards autonomous R&D laboratories that drive strategic research and technological development.

Public vs Private Contribution to R&D:
- Private industry contributions in India lag behind many other economies.
- Indian businesses contribute approximately $6.2 billion, representing 37% of the country's Gross Domestic Expenditure on R&D (GERD), compared to the global average where business enterprises typically contribute over 65%.
- In leading innovative economies such as **China, Japan, South Korea, and the U.S., more than 70% of R&D funding comes from private industries**, driven by market forces and profit motives, with substantial R&D activities conducted in higher education institutions (HEIs).

Comparing India's R&D Funding with Other Countries:
- India's R&D is witnessing significant growth, with a notable increase in Gross Expenditure on Research and Development (GERD) from ₹6,01,968 million in 2010-11 to ₹12,73,810 million in 2020-21.
- However, with research and development investment as a percentage of GDP standing at 0.64%, India falls behind major developed and emerging economies such as China (2.4%), Germany (3.1%), South Korea (4.8%) and the United States (3.5%).

Comparison of research productivity and innovation metrics in selected countries (2021-22)

Country	Researchers per million inhabitants (2021) (FTE)	PhDs produced annually (2021) (Rank)	Publication output (2022) (Rank)	Top 1% most cited articles (% share)	Patents granted (2022) (Rank)
India	262	40,813 (3)	3,06,800 (3)	0.7	30,490 (6)
The U.S.	4,452	69,525 (1)	15,06,000 (1)	1.88	3,23,410 (2)
The U.K.	4,491	27,366 (5)	2,87,200 (4)	2.35	10,578 (15)
China	1,687	53,778 (2)	9,78,100 (2)	1.12	7,98,347 (1)
S. Korea	9,082	13,882 (11)	1,09,200 (16)	1.02	1,35,180 (4)
Japan	5,638	15,804 (10)	1,71,000 (9)	0.88	2,01,420 (3)

- Despite a lower GDP share for R&D, **India has become a significant producer of academic talent, generating 40,813 PhDs annually, ranking third after the U.S. and China**.
- India's research output is also strong, with over 300,000 publications in 2022, placing it third globally.
- In terms of patent grants, India ranks sixth worldwide with 30,490 patents in 2022, showcasing its growing innovation landscape and potential for further intellectual property development.

Budget 2024-25 and R&D:
- Leading Scientists' Opinion on the Budget:
- **N. Kalaiselvi, Director-General, CSIR:**
  - **Focus Areas**: Climate-resilient agriculture, critical minerals, miniature nuclear technology, and energy-efficient technologies.
  - **Budget Priority**: Emphasizes basic research, prototype development, innovation, and industry linkages.

- o **Sectoral Boosts**: Significant focus on space sector, agriculture productivity, energy security, and manufacturing.
- o **Critical Minerals**: Customs duty exemption on 25 critical minerals to enhance research.
- o **Clean Energy and Waste Management**: Prioritized areas with CSIR's involvement in technology development.
- o **Industrial Parks**: "Plug and play" parks and industrial corridor projects to promote CSIR technologies.
- o **Funding**: Rs 6,323 crore allocated for the Department of Scientific and Industrial Research.
- **Rajesh Gokhale, Secretary, DBT:**
  - o **Agriculture Research**: Emphasis on productivity and climate resilience.
  - o **Speed Breeding Platforms**: Initiated in various institutes to shorten crop development cycles.
  - o **Innovation in Biotechnology**: New PhD programs and angel tax abolition to boost startups.
  - o **Anusandhan National Research Foundation (ANRF)**: A Rs 1 lakh crore corpus for private sector-driven research and innovation.
- **Subhash Lakhotia, Distinguished Professor, Banaras Hindu University:**
  - o **Budget Allocation**: Similar to 2022-2023 with less than 10% increase, offset by inflation.
  - o **Funding Concerns**: Competition due to increased institutions, with per capita funding decreasing.
  - o **Zero Budgeting System**: Issues with mandated quarterly reports affecting research quality.
- **Others:**
  - o **ANRF and Space Technology**: Operationalization and venture capital fund for space startups.
  - o **Clean Energy**: Measures for solar and nuclear energy, reduced taxation on raw materials.
  - o **Pharmaceutical Manufacturing**: Increased allocation for PLI scheme.
  - o **Space Technology Fund**: Rs 1,000 crore venture capital fund for space technology.
  - o **Nuclear Technology**: Push for R&D in new nuclear technology and small reactors.
  - o **ANRF Clarification Needed**: Unclear on the focus of prototype development in basic research.
  - o **Funding Disparity**: Need for mechanisms to address funding disparities between central and state-run institutions.

About Anusandhan National Research Foundation (ANRF):
- The ANRF is a major initiative by the Government of India aimed at fostering a robust research and innovation ecosystem within the country.
- It aims to support and promote high-quality research across various disciplines, including science, technology, social sciences, and humanities.
- It seeks to bridge the gap between academia and industry by encouraging private sector investment in research and innovation.

Key Features:
- o **Support for Higher Education Institutions (HEIs)**:
  - ANRF aims to address funding disparities by providing support to state-run higher education institutions, which have traditionally received less funding compared to centrally run institutions like IITs.
- o **Focus on Innovation and Industry Linkages**:
  - The foundation will facilitate collaboration between research institutions and industries, promoting the commercialization of research and fostering innovation.
- o **Strategic Research Areas**:
  - Priority will be given to areas of national importance, including clean energy, critical minerals, climate resilience, and advanced technologies.
- **Operational Framework**:
  - o The ANRF will be operationalized to provide grants and funding for research projects, with a particular focus on strategic and high-impact areas.
- **Corpus Fund**:
  - o The **foundation has been allocated a substantial corpus of Rs 1 lakh crore**, aimed at providing sustained funding for research activities.

PRELIMS BOOSTER-THE HINDU & INDIAN EXPRESS

1ST AUGUST

1. Dividend Equalisation Fund (DEF)

Reserve Bank of India (RBI) asked UCBs to stop the practice of setting up a DEF.

About DEF

DEF are set **up by UCBs through appropriation of profits to pay dividends** in future years, when profits are insufficient or where the bank has posted a net loss. However, current rules distinctly prohibit making such payments from previously accumulated profits or reserves. **As a one-time measure, RBI also permitted UCBs to transfer the money in the DEF to general reserves/free reserves to provide better treatment of these balances for regulatory capital purposes.**

2. Sturgeon

World-Wide Fund for Nature report found four species of sturgeon, among the most endangered fish species globally.

These include **Stellate sturgeon, Russian sturgeon & beluga (Critically Endangered on IUCN list), and sterlet (Endangered on IUCN list)**

About Sturgeon

Sturgeons are **large, freshwater, or anadromous fishes of north temperate regions.** These fishes evolved 250 million years ago in Jurassic period and are **considered genetically "living fossils".** Sturgeons are heavily exploited globally for their roe/eggs (caviar) and meat. Since 1998, **international trade in all species of sturgeons has been regulated under CITES.**

3. World Heritage Committee (WHC)

46th Session of the World Heritage Committee (WHC) concluded successfully in New Delhi. WHC is responsible for the implementation of the World Heritage Convention of UNESCO. Also, it **defines the use of the World Heritage Fund**. It has the final say on whether a property is inscribed on the World Heritage List.

Major Outcomes/Developments of 46th WHC

- Addition of Moidams (from Assam) raises India's total number of World Heritage sites to 43.
- India pledged $1 million to the UNESCO World Heritage Centre.
- India and US signed the first **ever 'Cultural Property Agreement' to prevent and curb the illicit trafficking of antiquities from India to the USA.**

4. Seine River

Men's triathlon in Paris Olympics 2024 postponed due to high levels of pollution in Seine river in Paris.

About Seine River

Second longest river of France, after the Loire. **Rises from Burgundy** wine region of northeastern France. Flows north-westerly to the Normandy coast, where it empties into the English Channel. Drainage network of this river carries most of the French inland waterway traffic.

2ND AUGUST

1. Privilege motion

If a member believes that its privilege has been breached or misused, a motion or complaint can be raised to the Chairman or Speaker. **Parliamentary privileges are certain rights enjoyed by each House collectively and by members of each House individually, such as freedom of speech, etc.**

Article 105 deals with Powers, privileges, etc., of the Houses of Parliament and of the members and committees.

Question of privilege can be raised subject to 2-conditions:

- Question shall be restricted to a specific matter of recent occurrence.
- Matter requires intervention of the House.

2. Nirbhaya Fund

It was created **for the implementation of initiatives aimed at enhancing the safety and security for women in the country.** It is a non-lapsable corpus fund administered by the Ministry of Finance. **Ministry of Women and Child Development (MWCD) is the nodal**

Ministry to appraise/recommend proposals and schemes to benfunded under Nirbhaya Fund.
Funding pattern: 60:40 for all States; 90:10 for States with difficult terrains; 100% for UTs.
Covers One Stop Centres scheme, a component under Mission Shakti.

3. Nano-MIND

Researchers from South Korea have successfully demonstrated the ability to control specific brain regions in mice using magnetic fields, known as **Nano - Magnetogenetic Interface for Neuro Dynamics (Nano-MIND) technology.**

About Nano-MIND

It uses **magnetic fields and magnetized nanoparticles to selectively activate targeted brain circuits,** allowing for its wireless, remote, and precise modulation.
Significance: Can pave way for better understanding and manipulating complex brain functions such as cognition, emotion, and motivation; improve understanding sophisticated artificial neural networks, etc.

4. Alzheimer Disease

As per a study, Alzheimer's drug Leqembi slowed disease progression in patients over three years. **Leqembi is an antibody intravenous (IV) infusion therapy that targets and removes beta-amyloid from the brain.**

About Alzheimer Disease

It is **the most common type of dementia. It begins with mild memory loss and possibly leads to loss of the ability to carry on a conversation and respond to the environment**. Symptoms can first appear after age 60, and the risk increases with age.

5 AUGUST

1. Schistura Sonarengaensis

Recently a new species of loach fish has been found in **Sonarenga, Nakama, and Chiabol caves of Meghalaya's South Garo Hills district.**

About Loach fish:

These **are small elongated freshwater fishes of family Cobitidae** and are native to central and southern Asia. Usually nocturnal fishes that inhabit both still and flowing waters. Use their barbels (Sensory Organs) to comb the bottom for worms, larvae, and other food.

About Schistura Sonarengaensis

Morphological Features: Prominent eyes & dull white or pale-beige body.
Distinction: They are not blind like other cave species found in Jaintia and Khasi Hills.

2. Axiom Mission 4 (Ax-4)

India selected **Shubhanshu Shukla and Prasanth Balakrishnan Nair** (Group Captains in the IAF) for Axiom-4 mission.
They will train in U.S. and experience gained during the mission will be beneficial for human space programme.

Axiom Mission 4 (Ax-4)

It is the **fourth private astronaut mission of NASA** and a private US company Axiom Space. It is expected to dock with the International Space Station (ISS) for fourteen days. **Axiom Space has contracted SpaceX as a launch provider.**

3. Sovereign Green Bond (SGrB)

Second sovereign green bond auction of current financial year (FY25) received low response as traders refused to pay greenium. **Greenium refers to pricing benefits based on logic that investors are willing to pay extra/accept lower yields for sustainable impact.**

About SGrB:

Green bonds are used to **finance or refinance eligible green projects, resulting in environmental benefits.**
Union Budget 2022-23 announced SGrB for mobilising resources for green infrastructure.
Framework for the SGrBs was issued by the government in 2022

4. Surrogate Advertisement

Ministry of Health asked Sports Authority of India and BCCI to prevent surrogate advertisement of tobacco alcohol by sportspersons.

Surrogate advertising

It **involves advertising a product that cannot be advertised openly due to legal restriction**. Advertisers create ads that help in building a brand, and without naming the actual product that is being indirectly advertised. For example, a Tobacco company selling

stationary products. These advertising came into India after the Cable Television Networks (Regulation) Act, 1995 and its rule banned direct liquor, tobacco and cigarette advertisement. They are **banned under the Guidelines for Prevention of Misleading Advertisements and Endorsements for Misleading Advertisements, 2022.**

6 AUGUST

1. Flag Code of India
Union Minister for Home Affairs urged the countrymen to hoist the Tricolour at their homes under 'Har Ghar Tiranga' campaign. Hoisting/ display of the Indian National Flag are governed by the Flag Code of India, 2002 [as amended in 2021 & 2022].

Salient Provisions of the Flag Code of India, 2002
National Flag shall be made of **hand spun and hand woven machine-made, cotton/polyester/ wool/ silk/ Ichadi bunting**. Public can display National Flag day and Night. National Flag shall be rectangular in shape. **The Flag can be of any size but the ratio of the length to the height (width) of the Flag shall be 3:2**

2. Forest Advisory Committee:
Forest Advisory Committee (FAC) has exempted surveys involving drilling and felling of up to 100 trees for hydro and other developmental projects in forest areas from taking prior forest clearance.

About FAC
It is a **statutory body under Forest (Conservation) Act, 1980 under the Union Ministry of Environment, Forest and Climate Change (MoEF&CC).** FAC approves diversion of forest land for non-forest purposes. FAC assesses land request validity, evaluates impact minimization plans, and considers potential damage to local ecology and wildlife habitats. **Role of FAC is recommendatory in nature so far as diversion of forest land for purpose of non-forestry use is concerned.**

3. AstroSat and Vampire star
Researchers, using data from AstroSat, discovered a vampire star (named WOCS 9005) in star cluster M67. **Vampire Stars, known as Blue Straggler Stars (BSS), defy simple models of stellar evolution and show characteristics of younger stars.** They rejuvenate by eating up material from a binary companion star in a process known as mass-transfer in a binary system.

AstroSat
Launched in 2015, AstroSat is India's first dedicated space observatory. It is aimed at studying celestial sources in X-ray, optical and UV spectral bands simultaneously.

4. Substantive Equality
The Chief Justice of India has underlined the concept of Substantive Equality in the **State of Punjab v. Davinder Singh Case 2024 (Sub-classification in SC/ST reservation).**

About Substantive Equality
It refers to the principle that **the law must account for the different backgrounds and historical injustices faced by persons or groups.** It focuses on equality of outcomes and impacts of laws and policies.
While formal equality applies consistent rules, **substantive equality aims for social redistribution through moral principles.**

7 AUGUST

1. PARIVESH Portal:
Centre's PARIVESH portal crosses 50,000 clearances milestone

About Parivesh Portal
Parivesh stands for Pro Active and Responsive Facilitation by Interactive and Virtuous Environmental Single-window Hub. **Developed by Ministry of Environment, Forest and Climate Change through NIC. Objective:** Acts as a single window portal for Environment, Forest, Wildlife and Coastal Regulation Zone (CRZ) clearances and monitor their subsequent compliance across the nation.

2. Zinc Air Batteries
Type of metal-air battery that consists of a **zinc negative electrode and an air (oxygen) positive electrode.**
CSIR developed Zinc air Battery:
It has been **developed by combining an efficient durable cathode catalyst and an anti-freezing electrolyte fabricated for zinc-air batteries.** It used CoFe/Fe3C alloy/carbide hybrid structure which

enhances durability and efficacy in both liquid and solid-state zinc-air batteries.

Benefits: Portable, flexible, lightweight and can be used in extreme cold conditions.

3. Methanotrophs

Agharkar Research Institute has described India's first cultures of **indigenous methanotrophs named Methylocucumis oryzae.** Name 'methane eating cucumbers' has been given to this novel genus.

About Methanotrophs (Methane-utilizing bacteria)

These bacteria **oxidize methane and build up their biomass.**

Habitat: Wetlands, rice fields, ponds and other water bodies

Biofiltering: These **bacteria can oxidize methane produced in anaerobic environments**. When oxygen is present in soils, atmospheric methane is also oxidized. **These bacterias are natural methane mitigating agents.**

AUGUST 8

1. Godavari River (Dakshin Ganga)

Largest river of peninsular India.

Origin: Trimbakeshwar in Nashik district, Maharashtra.

It **falls into Bay of Bengal forming a delta**. It is known as **Akhanda Godavari** at Rajahmundry (Andhra Pradesh) before splitting into distributaries.

Basin states: Maharashtra, Andhra Pradesh, Chhattisgarh, Odisha, Madhya Pradesh, Karnataka and Puducherry.

Major Tributaries: Pravara, Dharna, Indravati, Pranahita, Dudhna, Manjira, Sabari.

Bounded by Satmala Hills (North), Ajanta Range and Mahadeo Hills (South), Eastern Ghats (East) and Western Ghats (West).

Hydropower projects: Nizam Sagar, Pochampad, Polavaram etc.

2. Kasturi Cotton Bharat

Ministry of Textiles empowered all ginners (who operate cotton gins which separate cotton fibre from seeds) in India to produce Kasturi Cotton Bharat brand. **Kasturi Cotton is premium quality Cotton from India with 100% traceability & certification, utilizing blockchain technology for traceability.**

About Kasturi Cotton Bharat

Joint initiative by the **Ministry of Textiles, Cotton Corporation of India, Trade Bodies & Industry.**

Aim: To work on the **principle of self-regulation by owning complete responsibility of Branding, Traceability and Certification of Indian Cotton** to enhance its global competitiveness and create a sustainable ecosystem.

Implementing Agency: Cotton Textiles Export Promotion Council (TEXPROCIL).

3. Infrastructure Investment Trust (InvIT)

Recently, NHAI made a successful pre-payment of a Rs. 15,700 crore loan from InvIT proceeds. **InvIT monetization proceeds are exclusively used for NHAI debt repayment.**

About InvIT

Collective Investment Scheme like mutual funds, enabling direct investment of money from individual and institutional investors in infrastructure projects to earn a portion of the income as return. Regulated by the SEBI (Infrastructure Investment Trusts) Regulations, 2014. Dividend and Interest income from InvITs is completely taxable as per the slab rate of the investor. **InvITs are classified as borrowers under the SARFAESI Act.**

4. Mpox:

'Deadliest' Mpox Virus has spread across African countries

About Mpox

Mpox (formerly known as monkeypox) is a disease caused by infection with a **virus, known as Monkeypox virus (MPXV).** MPXV is an enveloped double-stranded DNA virus of the Orthopoxvirus genus. **Mpox is a zoonotic disease, meaning it can be spread between animals and people.** It is **endemic, or found regularly, in parts of Central and West Africa.** The **virus that causes Mpox has been found in small rodents, monkeys, and other mammals that live in these areas.**

Symptoms: Skin rashes, headaches

Significance: Tackling Global Warming by reducing methane concentration in soil & atmosphere.

9 AUGUST

1. Tantalum

Central Government notified **Tantalum as a Critical and Strategic Mineral under the Mines and Minerals (Development and Regulation) Act, 1957.**

About Tantalum

Tantalum is a rare metal with the **atomic number 73** It's grey, heavy, very hard, and corrosion-resistant.

Characteristics:

When pure, **tantalum is ductile** (can be stretched, pulled, or drawn into a thin wire). Extremely high melting point.

Uses: Making capacitors in electronic devices, surgical equipment & implants, components for chemical plants, nuclear power plants, aeroplanes and missiles etc.

2. Hypervirulent Klebsiella pneumoniae (hvKp)

WHO has warned against superbug hypervirulent Klebsiella pneumoniae (hvKp).

About hvKp

It is a **type of drug-resistant bacteria that can cause rapidly progressing, deadly infections, even in people with healthy immune systems.** It can be found in the environment (soil and water) as well as in the upper throat and gastrointestinal tract of various animals and humans. It causes **pneumonia, urinary tract infections, bloodstream infections, and the nervous-system infection meningitis.**

3. Tribo-Electric Nanogenerator (TENG) technology

IIT Indore has developed footwear for military personnel based on TENG technology.

About TENG Technology

It **converts the mechanical energy generated from walking into electrical energy using the triboelectric effect**, which is then stored in a device embedded in the system. The **triboelectric effect refers to a charge of electricity generated by friction. It is considered as a portable and renewable energy source**. The stored energy can power small electronic devices, wearable devices, IoT (Internet of Things) devices, medical devices etc.

4. e-Sankhyiki Portal

It is designed to **create a comprehensive system for managing and sharing data, facilitating the easy dissemination of official statistics across the country.**

About e-Sankhyiki Portal

Aim: To provide timely and valuable data inputs for policymakers, researchers, and the general public.

Launched by: Ministry of Statistics and Programme Implementation (MoSPI)

It comprises two modules:

➢ **Data Catalogue Module:** It enables searching within datasets and tables, downloading relevant data, and enhancing its value and reusability.

➢ **Macro Indicators Module:** It provides time series data on key macro indicators, featuring tools for filtering and visualising data.

13 AUGUST

1. Neelakurinji

It has been included on the **IUCN (International Union for Conservation of Nature) official Red List of threatened species under the Vulnerable category.**

Neelakurinji (Strobilanthes kunthiana)

About: Shrub known for massive blooming every 12 years. **Semelparous, i.e., single reproductive episode before death.**

Location: Shola grasslands of Western Ghats - the Nilgiri hills, Palani hills and the Eravikulam hills of Munnar, also Shevaroy hills in the Eastern Ghats. The name Nilgiris (blue mountains) was derived from the colors of these flowers.

Major Threats: tea and softwood plantations, urbanization, invasion of exotic species like eucalyptus, black wattle, etc.

2. Dysbiosis

Irrational use of antibiotics is associated with dysbiosis.

About Dysbiosis

Dysbiosis refers to an imbalance of microbial species and a reduction in microbial diversity within certain bodily microbiomes. As a result, beneficial bacteria are usually minimized, whereas other bacteria that may be harmful increase in number. It **disturbs the immune function leading to inflammation** and sensitization of the immune system and causing autoimmune diseases

3. Meteorite Shower

The Perseid meteor shower started in July and peaked recently. Perseid meteors are debris left behind by the comet Swift-Tuttle.

About Meteorite Shower

It is a **celestial event in which several meteors hit Earth's atmosphere over a short period**. Meteors are space rocks that enter Earth's atmosphere. The bright streak seen with meteor showers is not actually rock but glowing hot air. **Meteor showers are usually named after a star or constellation** that is close to where the meteors appear in the sky.

4. Arecanut

Central Plantation Crops Research Institute (CPCRI), issued an advisory to control 'kole roga' (fruit rot disease) in arecanut plantations.

About Arecanut

Major Producers: Parts of Karnataka (largest producer), Kerala, Assam, Meghalaya, West Bengal and Andaman and Nicobar Islands.

Significance: Commercial crop, called betelnut or supari, essential ingredient of tobacco.

Altitude: 1000 m from mean sea level.

Temperature: between 4°C and 40°C.

Rainfall: Abundant and well distributed. Can grow in as low as 750 mm rainfall to as high as 4500 mm.

Soil: Laterite, red loam and alluvial soils are most suitable with pH range from 5.2 to 7.0.

14 AUGUST

1. PM Mudra Yojana

Type: Central Sector Scheme

Purpose: To create an inclusive, sustainable and value based entrepreneurial culture

Loan categories:

➢ Shishu (loans up to INR 50,000)

➢ Kishore (loans above INR 50,000 and up to INR 5 lakhs)

➢ Tarun (loans above INR 5 lakhs and up to INR 20 lakhs)

Credit Guarantee: To eligible micro units through CGFMU

2. Housing Finance Companies (HFCs)

Reserve Bank of India (RBI) tightened norms related to public deposit acceptance by HFCs. Ceiling for quantum of public deposits has been reduced from 3 times to 1.5 times of HFC's net owned fund (NoF).

About HFCs:

They are **corporate entities incorporated under Companies Act, 1956.**

Aim: providing housing loans and finance in a streamlined manner.

Regulation: Regulated by the RBI. (earlier regulated by National Housing Bank (NHB))

Types: Deposit-taking HFCs and Non-deposit taking HFCs

There are 97 HFCs in the country.

Advantages: Flexible loan approval compared to banks, consideration of lower credit scores.

3. Gurmar (Gymnema sylvestre)

Researchers have discovered anti-diabetic medicinal herb **Gurmar on Gaya's Brahmayoni Hill.**

About Gurmar

It is a **slow-growing, perennial, woody climber** found in central and southern India and tropical Africa.

Pharmacological Properties: Gymnemic acid an active component isolated from leaves of G. sylvestre has antiobesity and antidiabetic properties; It causes decrease in body weight and inhibits glucose absorption.

Applications:

Used in **dietary supplements for reducing body weight, blood cholesterol, and triglyceride levels.**

Council of Scientific and Industrial Research (CSIR) utilized Gurmar to develop anti-diabetic drug BGR-34. **Earlier, first diabetes drug Metformin was also derived from a medicinal plant, Galega.**

4. Silicosis

Researchers claim that present limits of daily exposure to silica dust can pose serious risks of developing silicosis. **Permissible Exposure Limit for silica dust in India is set at 0.15 mg/m3, which is high.**

About silicosis:

It is a **long-term lung disease, caused by prolonged inhaling of crystalline silica dust**. It causes hardening of lungs, shortness of breath and can be fatal. Silicosis is a progressive disease and has no cure.

About Silica:

Silica is naturally found in various types of rocks like quartz, soil etc.

Industries associated: Construction, mining, oil and gas extraction, pottery and sculpting, glass manufacturing etc.

19 AUGUST

1. Cabinet Secretary
Appointments Committee of the Cabinet (ACC) approved the appointment of new Cabinet Secretary with a 2-year tenure starting from Aug 30, 2024.

About Cabinet Secretary (CS)
Appointed by the ACC on seniority-cum-merit basis. Responsible for administration of Government of India (Allocation of Business) Rules, 1961 and Government of India (Transaction of Business) Rules, 1961.

Functions: Ensures inter-ministerial coordination, irons out differences among ministries and departments, etc. **CS is also the ex-officio Chairman of Civil Services Board (CSB).** CS has no authority over working departments, as CS is regarded as primus inter pares among secretaries of the Union Government.

2. Eri Silk
North Eastern Handicrafts and Handlooms Development Corporation successfully obtained Oeko-Tex certification for its Eri Silk. **Oeko-Tex certification is standard that ensures textiles are tested for harmful substances and produced in environment friendly conditions.**

About Eri Silk
Renowned as world's only vegan silk as moth inside the cocoon is not killed. Instead moth naturally exits the cocoon. It is produced by **silkworm Philosamia ricini which is multivoltine** and reared indoors 5-6 times a year.

NOTE: India produces all the five types of silk: **Mulberry, Eri, Tropical & Temperate Tasar, and Muga.**

3. Serosurvey
Indian Council of Medical Research (ICMR) has been conducting serosurvey since last year to determine exposure to Mpox among India's high-risk population.

About Serosurvey
It is the **collection and testing of blood (or proxy specimen such as oral fluid) from a specimen of a defined population over a specified period of time**.

Objective: To estimate prevalence of IgG antibodies against an infectious pathogen as an indicator of exposure to a pathogen.

Significance: Can be used to estimate prevalence of infection, immunity gap, key parameters for infectious disease modeling, etc.

4. NBFC-P2P leading
RBI **issued a master circular to tighten norms for Non-Banking Financial Companies (NBFCs)-** P2P lending platforms.

P2P lending involves **individual lending and borrowing money directly through digital platforms, without the involvement of traditional financial institutions like banks.**

Key Regulation
NBFC—P2P lending platforms are supposed to act as an intermediary for P2P lending participants. Limiting exposure of a lender across all P2P platforms to Rs.50,00,000 **Prohibits P2P platforms from promoting P2P lending as an investment product and cross-selling any insurance product.**

21 AUGUST

1. Purandar Figs
The Agricultural and Processed Food Products Export Development Authority (APEDA) facilitated the export of **India's first ready-to-drink fig juice, made from Purandar Figs, to Poland.**

About Purandar Figs
It was **awarded the GI Tag in 2016**. The fig is cultivated in many villages of **Purandar Taluka in Pune district. Maharashtra has the highest area 2242 hectares under fig plantation**. It is bell-shaped, larger in size than other varieties, and has a distinctive violet skin colour that differentiates itself from other varieties.

2. Zoopharmacognosy
Recently scientist highlighted a case of Zoopharmacognosy in Sumatran orangutan. **Orangutan treated a wound on his body by using local plant Fibraurea tinctoria.**

About Zoopharmacognosy
Process by which wild animals use medicinal plants for treatment of diseases and protection from parasites.

Examples of Zoopharmacognosy

Dogs: Chew grass and vomit it to get rid of infections in the stomach.

Pregnant lemurs: Nibble on tamarind leaves to aid milk production.

Pregnant elephants: Eat leaves of plants of Boraginaceae family to induce delivery.

3. AI Guardrails

Media reports have raised concerns around lack of guardrails in recently launched two AI models, **Grok-2 and Grok-2 mini by Elon Musk's xAI.**

About AI Guardrails:

These are frameworks and mechanisms designed to ensure **ethical, legal, and technical compliance with AI systems.** They prevent AI from causing harm, making biased decisions, or being misused. **AI guardrails are a critical component of AI governance and the development, deployment and use of responsible AI.**

4. Foot and Mouth Disease (FMD)

Union Minister of Fisheries, Animal Husbandry & Dairying recently reviewed measures taken towards achieving the goal of FMD-Mukt Bharat by 2030.

About FMD

It is a highly contagious viral vesicular disease of cloven-hoofed animals such as cattle, buffaloes, sheep, goats and pigs etc. It does not affect horses, dogs, or cats. **FMD is caused by an Aphthovirus of the family Picornaviridae**.

Symptoms: Fever and blisters on tongue and lips, in and around mouth, on mammary glands, and around hooves

Impact: Reduced milk yield, reduced growth rate, infertility, trade restrictions on animal products etc.

Steps taken: National Animal Disease Control Programme: For eradicating FMD and Brucellosis.

22 AUGUST

1. Super Blue Moon

Recently, super blue moon, an occurrence that happens on average every 10 years, was observed.

About Super Blue Moons

A **Super Blue Moon is the convergence of a Supermoon and a Blue Moon**. When the Moon is at or near its closest point to Earth (perigee) at the same time as it is full, it is called a Supermoon.

There are two types of Blue Moon.

A monthly blue moon occurs when a full moon is seen twice in a single month. A seasonal blue moon occurs when there are four full moons in a single season instead of the usual three.

2. Jan Poshan Kendras

Union Minister of Consumer Affairs, Food and Public Distribution launched pilot project for transformation of 60 Fair Price Shops (FPS) into Jan Poshan Kendras. **FPSs are shops licensed to distribute essential commodities issued under the Essential Commodities Act (1955)** to the ration card holders under the Targeted Public Distribution System.

About Jan Poshan Kendras

Kendras will offer a diverse range of **nutrition-rich food items to consumer as well as provide an additional source of income to the FPS dealers.** They have to store 50% products under the category of nutrition while the rest for keeping other household items. **The pilot will cover states of Gujarat, Rajasthan, Telangana, and Uttar Pradesh.**

3. Exotic Animal Species

Six-month period to report possession of exotic animal species as per Living Animal Species (Reporting and Registration) Rules, 2024 is set to expire in August 2024. **Exotic animal species are those species that are moved from their original range (location) to a new one.** As per rules, every person who is in possession of any living specimen of species listed in Schedule IV of the Wild Life (Protection) Act 1972, is required to report the details of such animals. **A licence is required for dealing in animal articles under Schedule IV and their hunting is prohibited.**

AUGUST 23

1. International Criminal Court (ICC)

Ukraine parliament votes in favour of joining the ICC.

About ICC

It is **an independent judicial body**. It may exercise jurisdiction over persons charged with genocide, crimes against humanity, war crimes and the crime of aggression. It is not part of the UN. **However, it is governed by the Rome Statute negotiated within the UN.** Also, the UN Security Council can refer certain situations to the Prosecutor of the ICC. **The International Court of Justice is the principal judicial organ of the UN.**

Members: 124 countries (India, China, Russia, and the US are not members)

2. Tera Hertz (THz) waves

TRAI has recommended establishing **Tera Hertz Experimental Authorisation** to develop innovative new technologies and services in the Tera Hertz band.

About Tera Hertz (THz)

THz radiation generally refers **to electromagnetic waves at the frequency of 0.1–10 THz**, which lies between the microwave and infrared regions of the spectrum.

Applications of THz

Space-based communication like Ea**rth Exploration-Satellite Service (EESS), radio astronomy service, etc.** Short-range wireless communication Security applications (like solid explosive material detection). Biomedical imaging and body surface diagnoses.

3. Hayflick limit

Leonard Hayflick passed away recently. He introduced the 'Hayflick limit' that fundamentally changed the understanding of aging.

About Hayflick limit

It is the **number of times a cell population can divide until it attains a cell cycle arrest**. It depends on the length of chromosomal telomeres, which decreases in standard cells with every cell division. The telomere is the region of repetitive DNA sequences at the end of a chromosome. **The "Hayflick limit", is around 125 years for humans**. Beyond this, no amount of diet, exercise, or genetic tweaking against diseases can extend the human lifespan.

4. Waterspout

Waterspout was **reported near the coast of Sicily (Italy).**

About Waterspout

A **waterspout is a column of cloud-filled wind rotating over a water body**. Despite its name, it is not filled with water from the ocean or lake. Instead, it **descends from a cumulus cloud**. The water inside it is formed by condensation in the cloud.

Types:

➢ Tornadic waterspouts (the most powerful and destructive type)
➢ Fair-weather waterspouts (rarely dangerous).

Conditions for formation: High levels of humidity and relatively warm water temperatures compared to the overlying air.

Regions for formation: Most common in tropical and subtropical waters.

27 AUGUST

1. Scrub Typhus

Recently, Chief Minister of Meghalaya tested positive for Scrub Typhus.

About Scrub Typhus

Also known as bush typhus, it is a **disease caused by bacteria called Orientia tsutsugamushi**. It is spread to people through bites of infected chiggers (larval mites).

Symptoms: Fever, headache, body aches, and rash, a scab-like region at the chigger bite site (eschar) etc.

No vaccine is available for scrub typhus.

Most cases of scrub typhus occur in rural areas of **South East Asia, China, Indian subcontinent, Northern Australia, etc.**

2. Atacama Salt Flat

A study by Researchers at the University of Chile found that Chile's Atacama salt flat is sinking due to lithium brine extraction.

About Atacama Salt Flat

Also known as **Salar de Atacama, it is the biggest salt deposit in Chile.** It has a rough white surface below which there is a large salt lake. Lake under the salt flat has one of the largest lithium reserves in the world. **It lies in Chile's Atacama Desert, probably the driest place on the planet**. The northern part of the basin is the San Pedro River delta.

3. Sonoluminescence

Pistol shrimp (family Alpheidae) exhibit Sonoluminescence by rapidly snapping their claws.

About Sonoluminescence:

It **refers to the phenomenon of producing light through the irradiation of liquids with ultrasonic waves**. It is formed when bubbles formed by cavitation in liquids interact with powerful sound waves. The alternating high and low pressure of sound waves leads to rapid expansion and contraction of bubbles. This **results in intense temperature rise, ionization of gases within the bubble and release of light energy.**

AUGUST 28

1. Unified Lending Interface (ULI)

Reserve Bank of India to launch ULI.

About ULI

It is a **technology platform which would enable frictionless credit**. It will facilitate a seamless and consent-based flow of digital information, including land records of various states, from multiple data service providers to lenders. It will have a common and standardised Application Programming Interface designed for a 'plug and play' approach.

Benefits of ULI

Enables borrowers to get benefit of seamless delivery of credit, quicker turnaround time without requiring extensive documentation. Addresses credit demand gaps for agriculture and MSME sectors.

2. Plea Bargaining

As per the Ministry of Law and **Justice, only 0.11% of cases were resolved through plea bargaining in 2022.**

About Plea Bargaining:

It is an agreement between defense and prosecution where accused pleads guilty for a lesser offense or a reduced sentence. **Introduced in 2006 as part of a set of amendments to CrPC.** In **section 290 of Bharatiya Nagarik Suraksha Sanhita, 2023 (BNSS),** plea bargaining has been made time bound and application can be made within 30 days from date of framing of charge.

Application: Applies only to offenses punishable by up to seven years of imprisonment, with further restrictions excluding cases involving crimes against women, children or socio-economic offenses.

3. Leptospirosis (Rat Fever)

A surge in Leptospirosis cases has affected almost all districts in Kerala.

About Leptospirosis

Infectious disease caused by **pathogenic bacteria called leptospires** that are transmitted directly or indirectly from animals to humans. **Thus, it is a zoonotic disease**. Bacteria enter body through cuts or abrasions on skin. Human-to-human transmission occurs very rarely. Most common in tropical and subtropical areas with high rainfall.

Initiative taken to control: Programme for Prevention and Control of leptospirosis by Ministry of Health and Family Welfare.

4. Mass wasting

Environmental scientists raised concern in a new study on high frequency of mass wasting events in Sedongpu Gully of Tibetan Plateau since 2017.

About Mass wasting

A geological event, **mass wasting is the gravity-influenced movement of rock and soil down a slope**. Rapid earth movements triggered by rain or seismic activity E.g., Rock falls, slumps, and debris flows.

About Sedongpu Gully

Located in Tibetan Plateau near Arunachal Pradesh Border. It's found in catchment of the Sedongpu glacier and its valley. It **drains into the Yarlung Zangbo or Tsangpo river.**

29 AUGUST

1. Perpetual bonds:

They **are fund-raising instruments that do not carry any maturity date as bonds usually do**. Instead, they offer to pay their buyers a coupon or interest at a fixed date for perpetuity. Investors can get the principal back by selling the bond in the secondary market, or when the issuer decides to redeem the bonds. These **bonds**

have an obligation only to pay interest and are not required to repay the debt.

2. Solar Paraboloids

Solar Paraboloid technology is being seen as the frontier technology in improving solar energy efficiency.

About Solar Paraboloids:

It is an **advanced form of Concentrating Solar Power (CSP) and operates using a Parabolic Trough Collector (PTC).** It consists of parabolic mirrors focussing sunlight onto the receiver tube placed at the focal line.

Advantages over traditional PV system: Ability to operate at high temperatures, higher thermal efficiency, reduced heat losses.

Challenges: high upfront costs, infrastructure requirements.

3. Cholera

Bharat Biotech launched its Oral Cholera Vaccine (OCV), Hillchol. **Hillchol vaccine is an inactivated, single-strain oral vaccine suitable for children older than one year**. It will address the global shortage of cholera vaccines

About Cholera

It is an **acute diarrheal infection of the intestine caused by bacteria Vibrio Cholerae.**

Sources: Faecal contamination of water and food (poverty related disease). It causes severe diarrhea and dehydration.

4. Axis of Resistance

It is a **network of autonomous militant Islamist groups led by Iran** and its roots go back to the Iranian Revolution of 1979. It includes **Hezbollah, (Lebanese Shia militant organization) Hamas, (Palestinian Sunni militant group) Palestinian Islamic Jihad, Houthis (Yemen militant group)** Hezbollah (meaning 'Party of God') which was founded in the early 1980s in Lebanon is the biggest and most capable member of the "axis of resistance".

5. Codon De-optimisation Technology (CDT)

Indian Immunologicals Limited in collaboration with Griffith University has developed a needle-free intra-nasal booster vaccine against SARS-CoV-2 using CDT

About CDT

It is a **technology which involves decreasing the frequency of underrepresented codon pairs (genetic determinants for amino acids) without changing the amino acid sequences**.

Benefits:

Efficient virus attenuation strategy, where the degree of attenuation can be regulated as required. Attenuated(weakened/thinned) strains of viruses are used as vaccines as they stimulate a protective immune response while causing no/mild disease. Extremely Safe and takes less time.

30 AUGUST

1. Finternet

Recently, former chairperson of UIDAI Nandan Nilekani talked about "Finternet" as the future of financial systems at the Global Fintech Fest 2024

About Finternet

It is a **vision for the future financial system:** multiple financial ecosystems interconnected with each other– much like the internet. It is **user-centric concept introduced in a paper by Agustin Carstens (former head of Bank of International Settlements) and Nandan Nilekani (UIDAI).** Leverages innovative technologies such as tokenization and unified ledgers, including all kinds of asset classes into a robust regulatory framework.

Comprises of 3 U's: User; Unified; Universal.

2. Piezoelectric Polymer

Researchers from the Centre for Nano and Soft Matter Sciences (CeNS) have developed a security alert system based on Piezoelectric Polymer nanocomposite. **CeNS is an autonomous institute of the Department of Science and Technology.**

About Piezoelectric Polymer

Piezoelectric polymers are **class of material that can generate electric charges on the surface under pressure or strain, thus converting mechanical energy into electrical energy, i.e. energy harvesting.**

Advantages: They are widely used due to their **flexibility, lightweight, and processability**. They can be easily shaped into large areas and curved surfaces.

Applications: Sensors, wearables, medical implants, consumer electronics, etc.

3. Quasar

Astronomers have discovered the brightest quasar ever observed, named J0529-4351, using European Southern Observatory's (ESO) Very Large Telescope (VLT).

About Quasar

The word quasar is short for **"Quasi-stellar Radio Source".** Quasars are the **active galactic nuclei (bright cores of distant galaxies) and they are powered by supermassive black holes.** They are among the most luminous objects in the known Universe. Despite their brightness, due to their great distance from Earth, no quasars can be seen with an unaided eye. They emit **radio waves, visible light, UV rays, infrared waves, M X-rays, and gamma-rays.**

4. Northern Bald Ibis

Once extinct from Europe, Northern Bald Ibis have now returned to the continent.

About Northern Bald Ibis (Geronticus eremita)

Geographical range: Historically located in the European Alps, Northern Africa, and the Middle East.

Habitat: Semi-arid desert, steppe regions. They feed on rocky areas or cliffs that are located near a stream or river. **Reproduction:** Monogamous birds that only have one mate during their lifetime. They find their mate by using their croop call.

Behaviour: Colonial bird that migrates seasonally. **They live in groups that also flock together to the migrating habitat.** Don't instinctively know which direction to fly to migrate without guidance of wild-born elders.

IUCN Conservation Status: Endangered.

PRESS INFORMATION BUREAU (PIB)

2ND AUGUST

1. National Pharmaceutical Pricing Authority:
It was **set up in 1997** to fix and revise the prices of controlled bulk drugs, and formulations and to enforce prices and availability of the medicines in the country, under the **Drugs (Prices Control) Order, 1995**. It is an **independent regulator for pricing of drugs** and to ensure availability and accessibility of medicines at affordable prices.

Functions:
- To implement and enforce the provisions of the **Drugs (Prices Control) Order in accordance with the powers delegated to it.**
- To deal with all legal matters arising out of the decisions of the Authority.
- To monitor the availability of drugs, identify shortages, if any, and to take remedial steps
- To collect/ maintain data on production, exports and imports, market share of individual companies, profitability of companies etc, for bulk drugs and formulations
- To undertake and/ or sponsor relevant studies in respect of pricing of drugs/ pharmaceuticals
- To render assistance to the Central Government in the parliamentary matters relating to the drugs

Nodal Ministry: It is an attached office of the Department of Pharmaceuticals (DoP), Ministry of Chemicals and Fertilizers.

2. National Apprenticeship Training Scheme:
It is one **of the flagship programmes of Government of India for Skilling Indian Youth in Trade disciplines.** The National Apprenticeship Training Scheme under the provisions of the **Apprentices Act, 1961 amended in 1973.** It offers Graduate, Diploma students and Vocational certificate holders; practical, hands-on On-the-Job-Training (OJT) based skilling opportunities.
Duration: Ranging from 6 months to 1 year.
During the period of apprenticeship, the apprentices are paid a stipend amount, 50% of which is reimbursable to the employer from the Government of India. At the end of the training period the apprentices are issued a Certificate of Proficiency by the Government of India which can be registered at all employment exchanges across India as valid employment experience. There is **no guarantee of employment after completion of training as an apprentice.**

National Apprenticeship Training Scheme (NATS) 2.0 Portal
It **facilitates the registration and application process for apprenticeships, allowing industries to manage vacancies and contracts**. This provides young graduates and diploma holders with essential employability skills and a guaranteed monthly stipend. It manages the entire apprenticeship lifecycle, including student registration, vacancy advertisements, applications, contract creation, certification, reporting, and stipend disbursal through DBT. **It is developed by the Ministry of Education with AICTE and the Board of Apprenticeship Training/Practical Training (BoATs/BoPT).**

3. Exercise 'Tarang Shakti:
India will host the international air exercise 'Tarang Shakti' in two phases, taking place in **Tamil Nadu and Rajasthan.** It will be the **largest international air exercise ever conducted in India**, with invitations extended to **51 countries**. This exercise aims to strengthen strategic relations with our friends from the international community.
Objective: The plan is to **invite friendly foreign countries** with whom the IAF interacts regularly and has a certain degree of interoperability.
Participating countries: Fifty-one countries were invited to take part in the exercise and nearly **30 of them will be taking part in it.**

4. Jhumur:
It is a **traditional dance of the tea tribe communities of Assam**. The **dance is usually performed during the Autumn season in Assam**. This dance is also found in a few parts of West Bengal. This dance is performed by young girls mostly in an open area like a field or under a tree. The girls performed this dance, accompanied by male members to maintain the rhythm and vocals and play musical instruments. **The dance is performed to the rhythmic accompaniment of the Madal, a popular two-headed hand drum**. Further accompanying the drums are flute, and a pair of Taals that make the music

more harmonious. The girls mostly perform the dancing part, holding each other's waist and moving hands and legs forward and backward synchronously. **This dance incorporates songs and dialogues, which depict the joys and sorrows, yearning and aspirations of the everyday lives of the common peopl**e. Sometimes this dance is performed as a ritual worship, sometimes for courting and lovemaking, and sometimes for prayer for rainfall by the tea tribe communities of Assam. It is **believed that Jhumur was originally a means of recreation between phases of tedious agricultural work**

5 AUGUST

1. Genetic Screening:

It is a tool used to identify individuals who are at a higher risk of developing a particular disorder or who carry a specific gene for a disorder. It is a **type of genetic testing, used to identify changes in an individual's genetic material, such as their chromosomes, genes, or proteins**. Genetic material carries information that is important for determining various traits, like one's hair or eye color and can be passed down from parents to children. Some genes may be altered in an individual, which may then increase an individual's risk of developing a certain disease/condition. **Genetic screening seeks to identify altered genes in individuals in order to determine any risk and provide preventive measures and early treatment options accordingly.**

Genetic Testing in Sports:

Genetic tests, initially used for detecting diseases or predispositions, entered the s**porting world in the late 1990s,** when scientists began to gather evidence that genes influence various aspects of athletic performance, including endurance, flexibility and psychological traits. Scientists study genetic variants, which are differences that arise from mutations in specific DNA sequences. These mutations contribute to unique athletic characteristics and traits. **On average, 66 percent of differences in athlete status can be explained by genetic factors, with the remaining shaped by environmental factors such as practice, nutrition, birthplace, and the availability of medical and social support.**

2. Price Monitoring System App:

The **Price Monitoring Division (PMD) in the Department of Consumer Affairs is responsible for monitoring prices of selected essential commodities**. To improve the quality of price data, the department launched a Mobile App in 2021 - the PMS App - for the reporting of daily prices by the price reporting centres.

Source of price data: Retail and wholesale prices of commodities from 550 centers are received daily from the State Civil Supplies Departments of the respective State Governments through Mobile App. **At present the price is monitored for 22 essential commodities** (Rice, Wheat, Atta, Gram Dal, Tur (Arhar) Dal, Urad Dal, Moong Dal, Masur Dal, Sugar, Gur, Groundnut Oil, Mustard Oil, Vanaspati, Sunflower Oil, Soya Oil, Palm Oil, Tea, Milk, Potato, Onion, Tomato and Salt). The newly added 16 items included are Bajra, Jowar, Ragi, Suji (wheat), Maida (wheat), Besan, Ghee, Butter, Brinjal, Egg, Black Pepper, Coriander, Cummin seed, Red chillies, Turmeric powder and Banana. **The 38 commodities constitute close to 31% of the total CPI weights as against 26.5% of CPI weights captured by the 22 commodities.**

Significance: The price data monitored by the Department provides advance inputs for policy decisions for the Government, RBI and analysts regarding CPI inflation.

3. WHO Global Traditional Medicine Centre (WHO GCTM):

WHO GCTM in Jamnagar, Gujarat, is a knowledge centre for traditional medicine. The Indian Prime Minister laid the foundation stone for the centre in the presence of the WHO Director-General in April 2022. It is **the first global outpost centre for traditional medicine across the globe and was established under the Ministry of AYUSH.** The primary objective of WHO GCTM is to **harness the potential of traditional medicine from across the world through modern science and technology and improve the overall health of the communities the world over**. It will concentrate on building a solid evidence base for policies and standards on traditional medicine practices and products and help countries integrate it as appropriate into their health systems and regulate its quality and safety for optimal and sustainable impact.

The new centre focuses on four main strategic areas:

➢ Evidence and learning.
➢ Data and analytics
➢ Sustainability and equity
➢ Innovation and technology to optimise the contribution of traditional medicine to global health and sustainable development.

At the same time, **respect for local heritages, resources, and rights is a guiding principle.**

4. Mahila Samman Savings Certificate (MSSC) Scheme:

This is **a one-time scheme announced in Budget 2023 and will remain available for a two-year period, i.e., up to March 2025.** It is a risk-free scheme dedicated towards women and girls of all age groups. The scheme offers a maximum deposit facility of up to Rs 2 lakh in the name of women or girls for a tenure of 2 years.

Benefit: It will encourage more women to adopt formal financial saving instruments.

Eligibility: Any individual women. The minor account can also be opened by the guardian.

Investment: The deposit amount under this scheme is limited. A minimum of Rs. 1000 and any sum in multiples of one hundred rupees may be deposited in an account subject to a maximum of Rs. 2 lakhs.

Interest Rate: It offers a fixed interest rate of 7.5 percent. Interest shall be compounded every quarter and credited to the account.

The M**aturity period/Lock-in period of the scheme is 2 years from the date of opening of the account**. However, the account holder can withdraw up to 40% of the account balance after one year from the account opening date as a partial withdrawal. There is **a provision for multiple account opening under this scheme with a condition that a woman can open a second MSSC account after a minimum gap of three months** from the opening of the existing account. However, the total deposit, including all the accounts, should not exceed Rs 2 lakh. **There are no tax benefits.**

6 AUGUST

1. Climate Finance Action Fund:

Azerbaijan, which will host the 29th Conference of Parties to the United Nations Framework Convention on Climate Change, announced a new fund called the 'Climate Finance Action Fund'. It will be capitalised with contributions from fossil fuel producing countries and companies across oil, gas and coal, and Azerbaijan will be a founding contributor. It was launched within a package of 14 initiatives under the framework of the COP29 thematic days. **It will be a catalytic public-private partnership fund, mobilising the private sector and de-risking investment**. The fund will also contain special facilities with concessional and grant-based support to rapidly address the consequences of natural disasters in the developing countries in need. It will become operational at the conclusion of the initial fundraising round, which seeks to capitalise the fund with $1 billion, and when 10 contributing countries committed as shareholders. **Fifty percent of the capital will be directed towards climate projects in developing countries that rely on support, across mitigation, adaptation, and research and development. Fifty percent of the contributions will be allocated to helping meeting members' the next generation of Nationally Determined Contributions (NDCs) to keep the 1.5C temperature target within reach**. Twenty percent of the revenues generated from investments will be deposited in a Rapid Response Funding Facility (2R2F) providing highly concessional and grant-based support**. The fund will be headquartered with its secretariat in Baku, Azerbaijan.**

2. Astra Missile:

Astra is a Beyond-Visual-Range (BVR) air-to-air missile designed to be mounted on fighter aircraft. **It is indigenously developed by the Defence Research and Development Organisation (DRDO) and manufactured by Bharat Dynamics Ltd. (BDL) for the Indian Air Force (IAF).** The missile was built to engage and destroy aerial targets, which have high maneuverability and supersonic speed. The **missile is capable of advanced air combat, which allows it to engage in multiple high-performance targets.** It is the best in its class of weapon systems in the world in the category of air-to-air missiles. The missile is being developed in multiple variants to meet specific requirements.

Features:

➢ It has a **range of 80 to 110 km** in a head-on chase and can travel at 5 Mach speed (almost hypersonic).

- The missile uses an inertial guidance system driven by a fibre optic gyroscope with terminal guidance through active radar homing.
- It offers the pilot the option to choose between "**Lock on Before Launch – LOBL" and "Lock on After Launch – LOAL"** and later allows the aircraft to shoot and scoot to safety after firing the missile in the direction of the target.
- It is based on an **advanced solid-fuel ducted ramjet (SFDR) engine technology.**
- It is capable of operating under all weather conditions, both day and night and offers high overall reliability and a very high "Single Shot Kill Probability – SSKP".

3. Bailey bridge:

It is a **type of modular bridge**, one whose parts are pre-built so that they need minimal construction work and can be assembled quickly when needed.

Origin: A US Army Engineer School manual notes that the Bailey bridge originated during wartime. **Donald Coleman Bailey, an English civil engineer, invented it during World War 2 (1939-45).**

The **pre-fabricated parts in a Bailey bridge include light steel panels linked through pins, which are big, screw-like objects. These help establish the guardrails of the bridge**. Through the guardrails on either side, workers place beams to form the deck or path of the bridge. All beams were constructed such that they would lock in on the guardrails to ensure stability. After that, the bridge can be extended, and the lightness of the parts allows it to be mobile. No heavy installation equipment is needed. In disaster relief situations, this is ideal because parts can be transported in small trucks — something also of use during wartime.

4. Glioblastoma:

It is a **type of cancer that starts as a growth of cells in the brain or spinal cord.** Like all cancers, glioblastoma is caused by DNA mutations that result in uncontrolled cell growth. The underlying causes for these genetic cell mutations are largely unknown. **Glioblastoma forms from cells called astrocytes that support nerve cells**. Astrocytes help give your brain the nutrients it needs. **Glioblastoma tumors make their own blood supply, which helps them grow**. It's easy for them to invade normal brain tissue. It grows quickly and can invade and destroy healthy tissue. It can happen at any age. However, it tends to happen more often in older adults. It accounts for almost half of all cancerous brain tumors in adults.

Symptoms:
- Glioblastoma symptoms may include headaches that keep getting worse, nausea and vomiting, blurred or double vision, trouble speaking, altered sense of touch, and seizures.
- There also may be trouble with **balance, coordination, and moving parts of the face or body.**

Treatment:
- **There's no cure for glioblastoma**. Treatments might slow cancer growth and reduce symptoms.
- The main treatments for glioblastomas are **surgery, radiotherapy and chemotherapy**

7 AUGUST

1. Miombo Forest:

Recently, the United Nations Food and Agriculture Organization (FAO) and the Italian Agency for Development Cooperation (AICS) have signed two agreements for the implementation of projects aimed at protecting the Miombo forest. The **Miombo is a biome that includes tropical and subtropical grasslands, bushlands and savannahs**. It is a vast African dryland forest ecosystem **covering close to 2.7 million square kilometres across southern Africa, including Angola, the Democratic Republic of the Congo, Malawi, Mozambique, Tanzania, Zambia and Zimbabwe**. The woodlands are characterized by the **dominance of Brachystegia species**, either alone or in association with Julbernardia and Isoberlinia species. It also **encompasses four bio-regions and is responsible for maintaining the Greater Zambezi, one of the most important transnational river basins**. It is facilitating trade in the border region between Mozambique and Zimbabwe.

Significance of this forest: This forest is vital for millions of people in rural areas, providing essential resources such as firewood, food, and water.

2. VIRAASAT:

It is organized by the National Handloom Development Corporation Ltd (NHDC) under the Ministry of Textiles**.
The series "VIRAASAT"- the "Exclusive Handloom**

Expo" is a continuation of celebrations held during the previous year around the **National Handloom Day.**

Focus: The event focuses on the glorious tradition of Handloom and Handicrafts. It also provides a market connection to the handloom weavers and artisans.

The unique products such as **Banarasi, Jamdani, Baluchari, Madhubani, Kosa, Ikkat, Patola, Tussar Silk, Maheshwari, Moirang Phee, Baluchari, Phulkari, Laheriya, Khandua and Tangaliya will be featured.**

National Handloom Day:

Historical context: The **Swadeshi Movement which was launched on 7th August 1905** had encouraged indigenous industries and in particular handloom weavers. Since 2015, the Government of India decided to commemorate the 7th of August every year as National Handloom Day. **The first National Handloom Day was held on 7th August 2015 in Chennai. It aims to recognise the efforts and skills of the community of weavers engaged in this sector.**

3. Global Alliance for Improved Nutrition (GAIN):

It is a **Swiss-based foundation launched at the United Nations in 2002 to tackle the human suffering caused by malnutrition.**

Headquartered in Geneva, Switzerland, GAIN has offices in countries with high levels of malnutrition. Working with governments, businesses, and civil society, G**AIN aims at making healthier food choices more affordable, more available, and more desirable. GAIN's purpose is to improve nutrition outcomes by improving the consumption of nutritious and safe food for all people, especially the most vulnerabl**e. It mobilizes public-private partnerships and provides financial and technical support to deliver nutritious foods to those people most at risk of malnutrition. The organization also supports improved maternal and infant health by promoting breastfeeding and specialised products for infants over six months and young children. In addition, they partner with local businesses to improve the quality of food along agricultural value chains. **GAIN-supported nutrition programs are reaching an estimated 667 million vulnerable people in more than 30 countries.**

4. Indian Siris:

Indian Siris, also known as Albizia lebbeck, is a tropical tree native to India and Southeast Asia. **It belongs to the Fabaceae family and is a deciduous tree** with a wide range of uses. They require a warm and humid climate and can be grown in a variety of soil types, including clay, loam, and sandy soil.

Features:
➢ It grows up to a **maximum height of 15-20 meters** and has a wide-spreading, umbrella-shaped canopy.
➢ The tree trunk is typically straight. Its leaves are green and fern-like.
➢ It has a moderate to dense branching pattern, with branches that spread outwards and upwards from the trunk.
➢ It produces small, white and fragrant flowers in clusters.

Ecological Role: The **tree is capable of fixing nitrogen from the atmosphere, which helps to enrich the soil and support other plant species.** The extensive, shallow root system makes it a good soil binder and suited to soil conservation and erosion control.

9 AUGUST

1. Guru Ghasidas-Tamor Pingla Tiger Reserve:

The Chhattisgarh government on Wednesday announced that it would establish a new tiger reserve and named it as **Guru Ghasidas-Tamor Pingla Tiger Reserve**. It is located in the northern part of the state of Chhattisgarh, bordering Madhya Pradesh and Jharkhand. This will **be the fourth Tiger Reserve in Chhattisgarh, after the Udanti-Sitanadi, Achanakmar and Indravati Reserve**s. It is spread across the combined areas of the Guru Ghasidas National Park and Tamor Pingla Wildlife Sanctuaryin Chhattisgarh.

Fauna: This area is home to various mammal species, including tigers, leopards, hyenas, jackals, wolves, sloth bears, barking deer, chinkara, and chital.

Rivers: It serves as the origin of significant rivers such as Hasdeo Gopad and Baranga and a catchment area for rivers like Neur, Bijadhur, Banas, Rehand, and numerous smaller rivers and rivulets.

2. National Coastal Mission Scheme:

It was **launched in 2014**. It has been envisaged under the **National Action Plan on Climate Change**. It **aims to address the impact of climate change on coastal and marine ecosystems**, infrastructure and communities in coastal areas through a combination of adaptation and

mitigation measures. It is **under the National Coastal Management Program and is implemented with the following components:**

➢ Management Action Plan on Conservation of Mangroves and Coral Reefs
➢ Research & Development in Marine and Coastal ecosystem
➢ Sustainable Development of Beaches under Beach Environment & Aesthetic Management Service
➢ Capacity Building / Outreach
➢ Programme of Coastal States/UTs on conservation of marine and coastal ecosystems including beach cleaning drive.

Implementation: The implementing agencies of NCM are the State Governments of Coastal States and Union Territory (UT) Administrations.

3. Waqf:

Under the **Waqf Act of 1954, a Waqf refers to a property dedicated in the name of God for religious and charitable purpose**s. Legally, it is the permanent dedication by a Muslim of any movable or immovable property for purposes recognised by Muslim law as pious, religious or charitable. **A Waqf can be established through a deed or instrument, or a property can be considered a Waqf if it has been used for religious or charitable purposes over a long period.** The proceeds from Waqf typically fund educational institutions, graveyards, mosques, and shelter homes. **Once a property is designated as a Waqf, it becomes non-transferable** and is detained perpetually as a charitable act toward God, essentially transferring ownership to God. **Waqfs can be either public, serving charitable ends, or private, benefiting the property owner's direct descendants.** To create a Waqf, one must be of sound mind and hold valid ownership of the property. **The creator of a Waqf, known as the Waqif, does not have to be a Muslim, as long as they profess belief in Islamic principles.**

Regulation of Waqf:

Waqfs in India are regulated by the Waqf Act, 1995. A survey commissioner lists all properties declared as Waqf by conducting local investigations, summoning witnesses and requisitioning public documents. The Waqf is managed by a mutawali, who acts as a supervisor. Unlike trusts established under the Indian Trusts Act, 1882, which can serve broader purposes and be dissolved by the board, **Waqfs are specifically for religious and charitable uses and are intended to be perpetual.**

4. Rabari community:

The **Rabari are a nomadic camel-herding people whose name means "outside the way."** Most are Hindus. **The Raika are their Muslim counterparts.** They are one of perhaps a dozen castes of live-stock breeding seminomadic peoples or northwest India. The story of their arrival in Kutch (also Kachchh), Gujarat, is a story of momentous migration from the Himalayas to Punjab, Haryana, Mathura, Rajasthan and, finally, into Kutch via Pakistan. The community is known by different names in different states, like **Rabari in Gujarat, Raika in Rajasthan, Pal in Punjab, among others.** **They are predominantly endogamous but marriage between sub-groups is permitted.**

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1. Nandini Sahakar Yojana:

It is **aimed at assisting women cooperatives to take up business model-based activities under the purview of the National Cooperative Development Corporation (NCDC).** It is women focused framework of financial assistance, project formulation, hand-holding and capacity development.

Funding: There is no minimum or maximum limit on financial assistance to projects by women cooperatives. **NCDC provides a 2% interest subvention on its rate of interest on term loan portion for new and innovative activities.** 1% interest subvention on its rate of interest on term loan portion for all other activities resulting in lower borrowing costs of women cooperatives.

Eligibility:

Any cooperative society with three months in operation is eligible to apply for assistance which will be in the form of credit linkage for an infrastructure term loan. Women cooperatives are those which are registered as women cooperatives under any State / Central Act or those cooperatives which have a minimum of 50% women as primary members.

Significance:

The scheme is a framework of assistance to improve the socio-economic status of women. It su**pports the entrepreneurial dynamism of women through women cooperatives.** It converges critical inputs of **women's**

enterprises, **business plan formulation, capacity development,** credit and subsidy and interest subvention of other schemes.

2. Kasturi Cotton Bharat:

It is an **initiative of the Ministry of Textiles, Textile Trade Bodies, and Industry to create premium value for cotton grown in India as per benchmarked specifications**. It is a pioneering effort in traceability, certification and branding of Indian cotton. It was **formalised through the signing of a memorandum of understanding (MoU) between the Cotton Corporation of India and the Cotton Textiles Export Promotion Council on 15 December 2022.** To provide complete traceability of Kasturi Cotton Bharat-tagged bales across the supply chain, QR-based certification technology is being used at each stage of the processing, and a Blockchain-based software platform will provide end-to-end traceability and transaction certificates. In this regard, a **Microsite with QR code verification and Blockchain technology has been developed.** The Kasturi Cotton Bharat programme is operational at the national level, and its promotion is being made at national and international platforms. Hence, the allocation of funds is not at state level. Ginners across the country have been empowered to produce the Kasturi Cotton Bharat brand as per stipulated protocol.

3. Monkeypox (Mpox):

It is a **viral zoonotic disease caused by the monkeypox virus**. This virus is part of the same family as the virus that causes smallpox. **The first human case of mpox was recorded in 1970 in the Democratic Republic of the Congo (DRC).** Despite being named "monkeypox" originally, the source of the disease remains unknown. **There are two known types (clades) of mpox virus — one that originated in Central Africa (Clade I) and one that originated in West Africa (Clade II).** It's found mostly in areas of Africa but has been seen in other regions of the world.

Symptoms: Common symptoms of mpox are a skin rash or mucosal lesions, which can last 2–4 weeks accompanied by fever, headache, muscle aches, back pain, low energy, and swollen lymph nodes. **The mortality rate of mpox ranges from 0-11% in outbreaks, with young children being the most affected.**

Transmission:
Mpox spreads when you come into contact with an animal or a person infected with the virus. Human-to-human transmission of mpox occurs through direct contact with **body fluids, lesions, prolonged face-to-face contact, including sexual contact, and indirect contact with contaminated materials.**

Treatment:
There are no specific treatmentsfor Mpox virus infection. Early and supportive care is important to help manage symptoms and avoid further problems.

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1. Polar Coupled Analysis and Prediction for Services:
Aim: It aims to increase and improve weather, water, ice, and climate information about the Arctic and Antarctic. The project will help develop observation systems and Earth system models and advocate for improved forecasting services. It is **part of WMO's World Weather Research Programme (WWRP).**

World Weather Research Programme:
It promotes research to improve weather prediction, and its impacts on society, for minutes to months ahead.

WWRP's key objectives are:
➢ Advance research of the Earth system on times scales from minutes to months.
➢ This research, through the science-for-services value cycle approach provides locally and regionally actionable weather information.
➢ Improve the warning process to account for increasing risks and the evolving nature of extreme weather impacts.
➢ Quantify and reduce uncertainty in predictions on time scales from minutes to months

2. Nankai Trough:
Recently, Japan's meteorological agency said the likelihood of strong shaking and large tsunamis is higher than normal on the Nankai Trough. **It is a "subduction zone" between two tectonic plates in the Pacific Ocean, where massive earthquakes have hit in the past.** This underwater subduction zone is where the Eurasian Plate collides with the Philippine Sea Plate,

pushing the latter under the former and into the Earth's mantle.

Location: It **runs from Shizuoka, west of Tokyo, to the southern tip of Kyushu Island.** It has been the site of destructive quakes of magnitude eight or nine every century or two. **These so-called "megathrust quakes", which often occur in pairs, have been known to unleash dangerous tsunamis along Japan's southern coast.**

3. Exercise Udara Shakti:

It is the **joint air exercise was conducted in collaboration with the Royal Malaysian Air Force (RMAF) at Kuantan, Malaysia**. It was aimed at bolstering operational efficiency, technical experts of both Air Forces engaged in exchange of their maintenance practices. **During the exercise, IAF's Su-30MKI fighter jets engaged in air combat missions alongside the RMAF's Su-30MKM fighters.**

4. Mount Kilimanjaro:

It is **Africa's tallest mountain and the world's largest free-standing mountain** (which means not part of a mountain range). It is **located in northeastern Tanzania, near the Kenya border**. **Also called a stratovolcano**, Kilimanjaro is made up of three cones: **Kibo, Mawenzi, and Shira**. **Kibo is the tallest of the three volcanic formations, which is also a dormant volcano**, while the other two are extinct volcanoes. **Uhuru Peak, the highest free-standing peak in Africa, is located on the volcanic cone Kibo.** Kilimanjaro is also known for its snow-capped peak. The mountain has five main vegetation zones, from the lowest to the highest point: Lower slopes, montane forest, heath and moorland, alpine desert, and summit. The **Kilimanjaro National Park was named a United Nations Educational, Scientific, and Cultural Organization (UNESCO) World Heritage Site in 1987.**

14 AUGUST

1. Distributed Denial-of-Service (DDoS) Attack:

A DDoS attack is a **malicious attempt to disrupt the normal traffic of a targeted server, service**, or networkby overwhelming the target or its surrounding infrastructure with a flood of Internet traffic. **It is a cybercrime to prevent users from accessing connected online services and sites**. DDoS attacks achieve effectiveness by utilizing multiple compromised computer systems as sources of attack traffic. E**xploited machines can include computers and other networked resources, such as IoT devices**. Unlike other kinds of cyberattacks, DDoS assaults don't attempt to breach your security perimeter. Rather, a DDoS attack aims to make your website and servers unavailable to legitimate users. DDoS can also be used as a smokescreen for other malicious activities and to take down security appliances, breaching the target's security perimeter.

How does a DDoS attack work?
DDoS attacks are carried out with networks of Internet-connected machines. These networks consist of computers and other devices (such as IoT devices) which have been infected with malware, allowing them to be controlled remotely by an attacker. These **individual devices are referred to as bots(or zombies), and a group of bots is called a botnet.** Once a botnet has been established, the attacker can direct an attack by sending remote instructions to each bot. When a victim's server or network is targeted by the botnet, each bot sends requests to the target's IP address, potentially causing the server or network to become overwhelmed, resulting in a denial of service to normal traffic. Because each bot is a legitimate Internet device, separating the attack traffic from normal traffic can be difficult.

2. Model Solar Village:

It **aims to create one Model Solar Village per district across India.**

Goal: To **promote solar energy adoption** and enable village communities to become self-reliant in meeting their energy needs.

Funding: A total financial outlay of ₹800 crore has been allocated for this component, providing ₹1 crore per selected Model Solar Village.

Criteria:

In order to be considered a village under the competition mode**, a village must be a revenue village with a population size above 5,000 (or 2,000 for special category states).** The selection process involves a competitive mode where villages are assessed on their overall distributed renewable energy (RE) capacity installed 6 months after the declaration of the potential candidate by the District Level Committee (DLC). The winning village in each district, with the highest RE

capacity, will receive a central financial assistance grant of ₹1 crore.

Implementation: The implementation of this scheme will be done by the State/UT Renewable Energy Development Agency under the supervision of the District Level Committee (DLC).

3. Gotipua Dance:

It is the **majestic folk dance of Orissa which is the precursor to the classical Odissi dance form**. In the Orissa language, "**Goti" means "single" and "Pua" means "boy".** In these children are trained in singing, dancing, yoga, and acrobatics within gurukuls or akhadas. They dress as girls and perform at temple festivals, social gatherings, and religious ceremonies. In **ancient times, the temples of Orissa had female dancers called "Devadasi or Mahari (in Orissa)" who were devoted to Lord Jagannath**. During the time of Bhoi king Rama Chandra Dev with the decline of the Mahari dancers, the class of these boy dancers came into existence in Orissa, to carry out the tradition.

In its present form, the **Gotipua Dance is more precise and systematic in its conception.** Its performance includes Vandana (prayer to God, or a guru), Abhinaya (the enactment of a song) and Bandha Nritya (rhythms of acrobatic postures). **Bandha Nritya is a demonstration of physical prowess requiring great agility and flexibility.** The dancers make extensive use of their hands and feet. **Musical accompaniment to the Gotipua Dance is provided by the Mardala (a pakhawaj), Gini (small cymbals), harmonium, violin and flute.**

4. INS Arighat:

India is now all set to commission its second nuclear-powered submarine, INS Arighat, armed with nuclear missiles for strategic deterrence. It is **India's second indigenously built nuclear-powered ballistic missile submarine (SSBN), following India's first nuclear submarine, INS Arihant, commissioned in 2018**. It was constructed at the Indian Navy's Ship Building Centre (SBC) in Visakhapatnam. It represents a critical component of India's nuclear triad, enabling the nation to launch nuclear missiles from land, air, and sea.

Features:
➤ It will have one seven-blade propeller powered by a pressurized water reactor.

➤ It can **carry up to four nuclear-capable K-4 SLBMs** (Submarine Launched Ballistic Missile) with a range of over 3500 kilometers or twelve conventional warheads K-15 SLBMs with a range of about 750 kilometers.

➤ **The K-15 can also carry a strategic nuclear warhead**. It also carries torpedoes and mines.

➤ Additional safety measures include two standby auxiliary engines and a retractable thruster for emergency power and mobility.

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1. Amrit Bharat Station Scheme:

It is an **ongoing Indian Railways mission launched in February 2023 by the Ministry of Railway**s to redevelop railway stations across India. It is designed for the ongoing development of railway stations with a long-term perspective. **It involves the creation of master plans and their phased implementation to improve various aspects of station facilities.** The development plan takes into account the unique needs of each station, promoting a holistic approach to railway station enhancement. **The scheme aims to transform railway stations into modern, well-equipped hubs with improved passenger amenities, better traffic circulation, inter-modal integration and enhanced signage**. The scheme shall cater for the introduction of new amenities as well as the upgradation and replacement of existing amenities. **The ultimate goal is to transform these stations into vibrant city centres over the long term.**

Key Features:
➤ **Modern passenger amenities:** This includes providing clean and hygienic waiting areas, restrooms, Special amenities for the disabled, and food and beverage outlets.

➤ **Improved traffic circulation:** This includes creating separate entry and exit points for passengers and vehicles, widening roads and footpaths, and providing adequate parking facilities.

➤ **Inter-modal integration:** This includes providing seamless connectivity between railway stations and other modes of transport, such as buses, taxis, and autorickshaws.

- **Upgraded signage:** This includes providing clear and visible signage in multiple languages to guide passengers.
- **Sustainability:** This includes using energy-efficient lighting and appliances.
- **Eco-friendliness:** Rainwater harvesting systems and green spaces,
- Ballastless tracks, which reduce noise and vibration
- Roof plazas, where available, provide additional space for commercial activities and passenger amenities.

2. Jiyo Parsi Scheme:

It is a **unique Central Sector Scheme implemented by the Ministry of Minority Affairs** to arrest the population decline of the Parsi Community in India. The **scheme was launched in 2013-14. The objective of the scheme is to reverse the declining trend of the Parsi populatio**n by adopting scientific protocols and structured interventions to stabilize their population in India. **The scheme has three components: Medical Assistance, Advocacy, and Health of Community.**

Under the **Medical Component** of the scheme, **financial assistance is provided to Parsi Couples for medical treatment under standard medical protocol.**

Under the **Health of Community Component,** financial assistance is provided to Parsi Couples for **child care and assistance of elderly people.**

Under the **Advocacy Component**, advocacy/outreach programmes are conducted to generate awareness among the Parsi population.

3. FloodWatch India:

It **gives information related to the flood situation and forecasts for up to 7 days on a real-time basis to the public**. The in-house developed user-friendly app has readable and audio broadcast and all the information is available in 2 languages, viz. **English and Hindi**. **Other feature of the app includes real-time flood monitoring where users can check up-to-date flood situations throughout the country**. It utilizes near real-time river flow data from various sources. It also provides flood forecasts at the nearest location where users can check the flood advisory at the station nearest to them on the Home Page itself. **The app will also provide a State-wise/Basin-wise Flood Forecast(up to 24 hours) or Flood Advisory (up to 7 days) which can be accessed by selecting specific stations, state-wise or basin-wise from the dropdown menu**. This app utilizes advanced technologies such as satellite data analysis, mathematical modelling, and real-time monitoring to deliver accurate and timely flood forecasts.

FloodWatch India 2.0

It **provides current information at an additional 392 flood monitoring stations, taking up the total number of stations to 592**, thus imparting users with an extensive and detailed overview of flood conditions across the country. It also provides additional information regarding the storage positions of **150 major reservoirs in the country** which shall help in better understanding of the possible flood situation in their downstream areas.

4. Long Range Glide Bomb (LRGB):

It is an air-launched 1,000 kg class glide bomb capable of hitting targets at long distances.

Features:
- It is an **Air to Surface LRGB** with conventional warheads to destroy enemy airstrips, bunkers, hard installations, buildings etc.
- It is designed to integrate with fighter aircraft.
- It consists of an **Inertial Navigation based guidance system with Digital Control.**
- GAURAV has been designed and developed indigenously by the **Research Centre Imarat (RCI), Hyderabad**.
- After being launched, the glide bomb steers towards the target using a highly accurate hybrid navigation scheme with a combination of INS and GPS data.
- During the flight test, the glide bomb hit the target erected at Long Wheeler's island with pinpoint accuracy.
- Complete flight data during the test launch was captured by Telemetry and Electro-optical tracking systems deployed by the Integrated Test Range along the coastline.

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1. Prerana Programme:

It was **launched in January 2024 by the Union Education Ministry**. It is driven by a strong commitment to integrate principles of the Indian education system and the philosophy of value-based education which is a cornerstone of the National

Education Policy (NEP) 2020. **Prerana is a week-long residential program for selected students of class IX to XII. It is an experiential and inspirational learning program for students with the best-in-class technology where heritage meets innovation**. A batch of 20 selected students (10 boys and 10 girls) attend the program every week from various parts of the country. **Prerana program is running from a Vernacular School, established in 1888 in Vadnagar, Mehsana District, Gujarat.**

The curriculum of Prerana School prepared by IIT Gandhi Nagar is rooted in 9 value based themes: Swabhiman and Vinay, Shaurya and Sahas, Parishram and Samarpan, Karuna and Sewa, Vividhta and Ekta, Satyanishtha and Shuchita, Navachar and Jigyasa, Shraddha aur Vishwas, Swatantrata and Kartavya.

The program based on above themes will inspire the youth and foster respect for Bharat's unity in diversity, **embodying the spirit of "Vasudhaiva Kutumbakam.**

2. Forever chemicals:
Forever chemicals are scientifically known as per-and polyfluoroalkyl substances (PFAS). These chemicals are generally useful in applications such as water-proofing, heat resistance, detergents, food packaging and non-stick technologies. They are **known to stay in the environment virtually forever and contribute to environmental degradation** which adversely impacts the health of all organisms including human beings.

Health risks of PFAS:
- Testicular, kidney, liver and pancreatic cancer
- Reproductive problems
- Weakened childhood immunity
- Low birth weight
- Endocrine disruption
- Increased cholesterol
- Weight gain in children and dieting adults

3. Geneva Conventions:
They **are a set of four treaties which include more than 400 articles**, setting out detailed rules for the treatment of prisoners, protecting hospitals and medical staff, allowing humanitarian aid and prohibiting torture, rape and sexual violence. It was **formalised in 1949 by the United Nations. There are three additional protocols, the first two of which were formalised in 1977 and the third in 2005**. The focus of the Conventions is the treatment of non-combatants and prisoners of war and not the use of conventional or biological and chemical weapons, the use of which is governed respectively by The Hague Conventions and the Geneva Protocol.

List of conventions:
1. The First Geneva Convention: It **protects wounded and sick soldiers on land during war**. It is also applicable on medical and religious personnel, medical units and medical transports

2. The Second Geneva Convention:
It **protects wounded, sick and shipwrecked military personnel at sea during war**. This Convention replaced the Hague Convention of 1907 for the Adaptation to Maritime Warfare of the Principles of the Geneva Convention.

3. The Third Geneva Convention
It **applies to prisoners of war**. The Convention establishes the principle that prisoners of war shall be released and repatriated without delay after the cessation of active hostilities.

4. The Fourth Geneva Convention
It **protects civilians, including those in occupied territory**. It contains a short section concerning the general protection of populations against certain consequences of war, without addressing the conduct of hostilities.

4. New Ramsar sites:
1. Nanjarayan Bird Sanctuary: It is situated along the **north-eastern region of Uthukuli Taluk of Tiruppur District in Tamil Nadu**. The lake falls under two villages **(Sarkar Periyapalayam and Neruperichal).** The lake got its name from the fact that it was repaired and restored by King Nanjarayan who ruled the region many centuries ago.

2. Kazhuveli Bird Sanctuary: It was **declared as the 16th bird sanctuary in Tamil Nadu in the year 2021**. It is a brackish shallow lake located on the Coromandel Coast in Villupuram. **The lake is connected to the Bay of Bengal by the brackish Uppukalli creek and the Edayanthittu Estuary. Kazhuveli is one of the significant and biodiversity rich wetlands**. The lake is one of the largest wetlands in peninsular India. **The**

lake can be divided into three parts based on the water features viz., the estuarine part with brackish water, the Uppukali creek feeding the sea water and the Kazuveli basin with fresh water. This Bird Sanctuary lies in the Central Asian Flyway and is an important stopover site for migratory species of birds.

Flora: In areas of brackish water highly degraded mangrove patches containing Avicennia species and also reed (Typhaangustata) is found in several hundred hectares.

3. Tawa Reservoir:

It is the **largest protected area in the state of Madhya Pradesh**. It was constructed at the confluence of the Tawa and Denwa rivers. It is located inside the Satpura Tiger Reserve and forms the **western boundary of the Satpura National Park and Bori Wildlife Sanctuary.**

20 AUGUST

1. Gross Environment Product Index:

It is **presented as a novel, integrative metric designed exclusively to evaluate ecological development caused by human interventions.** It will be determined by the condition of four main constituents of the environment which are directly impacted by development activities including air and water quality, number of trees planted in a year and the measure of the area of organic soil. **The formula is, GEP index = (Air-GEP index + Water-GEP index + Soil-GEP index + Forest-GEP index)** It provides quantzierte assessments of improvements in air, water, soil, and forest quality.

Significance:

It **helps in assessing the impact of anthropological pressure on our ecosystem and natural resources**. It provides a robust and integrated method for assessing a state's ecological growth, capturing various facets of environmental well-being as a result of human actions

2. RISE Accelerator:

The **India Australia Rapid Innovation and Start-up Expansion (RISE) Accelerator is a bilateral program led by CSIRO and the Atal Innovation Mission (AIM), NITI Aayog**. It addresses India and Australia's shared challenges with a focus on environment and climate issues by supporting the expansion of innovative agritech solutions across borders. **It was launched in 2023 - has been instrumental in supporting start-ups**

and **MSMEs in validating, adapting, and piloting their technologies for new markets.** The Rapid Innovation and Start-up Expansion (RISE) Accelerator programme is designed to support businesses aiming for international expansion between India and Australia. This marks a significant milestone in fostering innovations that address India and Australia's most pressing shared challenges in the agriculture sector.

The Climate Smart Agritech cohort of the RISE Accelerator will focus on

Start-ups and MSMEs with technologies and solutions that **enhance agricultural productivity and resilience in the face of growing climate variability, resource scarcity and food insecurity.** The program is particularly interested in start-ups and MSMEs with solutions that prioritise farmer needs, priorities, and on-farm practices. Over the course of the nine months of the accelerator program, the **selected start-ups and MSMEs will benefit from a blend of self-paced online learning and in-person sessions, including immersion weeks in both India and Australia**. The program will also involve field trials and technology pilots in the latter half.

3. National Film Awards:

The **National Film Awards were established in 1954, when the awards were given for the films of the year 1953**. It aims at encouraging the production of films of aesthetic & technical excellence and social relevance and also to increase appreciation of different cultures and communities across India. The awards were initially called 'State Awards' and two President's Gold Medals, two certificates of merit, and 12 silver medals for regional films were presented in the earlier years. **The National Film Awards are given in three sections: Feature Films, Non-Feature Films, and Best Writing in Cinema. These awards have been administered by the Directorate of Film Festivals.**

Directorate of Film Festivals:

It was set up under this **Ministry of Information and Broadcasting in 1973.**

Objectives: Promotion of Indian films and cultural exchange through organization of various events in the country and participation in various International film festivals abroad.

The **Directorate of Film Festivals has been designated as the Nodal Agency for scrutiny of applications**

received for financial assistance under the Film Promotion Fund.

4. National Coal Index (NCI):

The **NCI is a price index which reflects the change in the price level of coal in a particular month relative to the fixed base year**. NCI combines the prices of coal from all the sales channels-Notified Prices, Auction Prices, and Import Prices. **It has been rolled out on 4th June 2020, and the aim is to have an index that will truly reflect the market price.** The concept and design of the index as well as the representative prices have been developed by the Indian Statistical Institute, Kolkata. It is **released every month by the Ministry of Coal. The base year is FY 2017-18**. The index is meant to encompass all transactions of raw coal in the Indian market.

22 AUGUST

1. Ethanol Blending:

Ethanol is a **biofuel produced through the fermentation of sugars by yeasts or via petrochemical processes such as ethylene hydration**. It is rich in oxygen content, enabling more efficient fuel combustion in engines. Ethanol blending involves mixing ethanol derived from agricultural products with petrol to create a blended motor fuel.

Production of Ethanol in India:

The Department of Food and Public Distribution (DFPD) is the primary agency promoting the establishment of fuel-grade ethanol distilleries. **Ethanol is produced from sugarcane-based materials like C & B heavy molasses, sugarcane juice, sugar syrup, surplus rice from the Food Corporation of India (FCI), and maize**. Globally, over 110 billion litres of ethanol fuel were produced in 2019, with the US and Brazil contributing 84% of this production.

Benefits of ethanol blending:

➢ **Energy security:** India imports over 85% of its oil, and ethanol blending could reduce reliance on petroleum imports.
➢ **Economic savings:** In 2020-21, India's net petroleum imports amounted to 185 million tonnes at USD 551 billion. Ethanol blending can save billions in foreign exchange.

➢ **Environmental impact:** Ethanol is a less polluting fuel, offering similar efficiency to petrol at a lower cost.

India's Biofuel Policy:

The **Central government amended the Biofuel Policy in 2021-22, targeting 20% ethanol and 5% biodiesel blending by 2025.** India achieved a 10% ethanol blending rate in petrol by June 2022, ahead of the November 2022 target. The programme has saved over Rs 54,000 crore in foreign exchange and led to a reduction of 30 million tonnes of greenhouse gas emissions over the past nine years.

Ethanol blending targets:

➢ **2025-26 Target:** Achieve 20% ethanol blending with petrol.
➢ **Current status:** Blending rates have increased to 13%-15%, up from 8% in 2021.
➢ **Capacity expansion:** India's ethanol production capacity has grown to 1,380 crore litres.
➢ **Major contributors: Uttar Pradesh is a significant contributor to ethanol blending**, with multi-fuel distilleries producing both sugarcane and grain-based ethanol.

2. Vaccine-Derived Polio (VDPV):

➢ **India's polio-free status: India was declared polio-free by the World Health Organization (WHO) in 2014,** with the last wild poliovirus case reported in 2011.
➢ **Vaccine composition:** The Oral Polio Vaccine (OPV) contains a weakened form of the poliovirus, which stimulates an immune response.
➢ **cVDPV development:** On rare occasions, in under-immunized populations, the excreted vaccine virus can circulate, undergo genetic changes, and potentially revert to a form capable of causing paralysis. This is known as circulating vaccine-derived poliovirus (cVDPV).
➢ **Global context:** Since 2000, over 10 billion doses of OPV have been administered globally, resulting in 24 cVDPV outbreaks in 21 countries, with fewer than 760 cases.
➢ **Prevention:** To stop cVDPV transmission, WHO recommends multiple rounds of high-quality immunisation campaigns.

Polio:

Polio overview: Polio is a viral infectious disease that can cause irreversible paralysis and even death by affecting the nervous system.

Wild Poliovirus strains: There are three distinct strains of wild poliovirus:
➢ Wild Poliovirus Type 1 (WPV1)
➢ Wild Poliovirus Type 2 (WPV2)
➢ Wild Poliovirus Type 3 (WPV3)

Although symptomatically similar, each strain has genetic and virological differences, necessitating separate eradication efforts.

Transmission: The virus primarily spreads through the fecal-oral route and can multiply in the intestine, where it can invade the nervous system. It predominantly affects children under five.

Available vaccines:
➢ **Oral Polio Vaccine (OPV):** Administered as a birth dose, followed by three primary doses at 6, 10, and 14 weeks, and a booster dose at 16-24 months.
➢ **Injectable Polio Vaccine (IPV):** This vaccine is given as an additional dose along with the third DPT (Diphtheria, Pertussis, and Tetanus) vaccine under the Universal Immunization Programme (UIP).

3. Teesta River:

It is a **trans-Himalayan River flowing through the Indian states of Sikkim and West Bengal and Rangpur in Bangladesh**. It is a tributary of Brahmaputra river. This river forms a boundary between **Sikkim and West Bengal.**

Course:

It **rises in the Himalayas near Chunthang in Sikkim (India), flows to the south, cutting a deep gorge through the Siwalik Hills east of Darjeeling (in West Bengal, India).** It turns southeast to run through the **Sivok Khola pass onto the plains of West Bengal**. Originally, the river continued southward to empty directly into the upper Padma River (Ganges). About 1787, however, the river changed its course to flow eastward, crossing the Rangpur region of Bangladesh to join the Jamuna River (Brahmaputra). It has a total length of about 309 kilometers.

Major Tributaries:
➢ **Left-bank Tributaries:** Lachung Chhu, Chakung Chhu, Dik Chhu, Rani Khola, Rangpo Chhu.

➢ **Right-bank Tributaries:** Zemu Chhu, Rangyong Chhu, Rangit River.

4. Shaheen-II Missile:

It is a **Pakistani medium-range surface-to-surface ballistic missile**. It is believed that the Shaheen 2 is derived from the People's Republic of China (PRC)-developed M-18, though this has not been confirmed. It is a **solid-fueled, two-stage missile with an estimated range of 1,500–2,000 km**. It is designed to carry conventional or nuclear payloads. Its separating warhead is thought to feature four small motors to improve accuracy; the missile's accuracy is estimated at 350 m circular error probable (CEP). It is **transported and launched by a 6-axle transporter erector launcher (TEL).**

26 AUGUST

1. Vigyan Dhara Scheme:

It is a new central sector scheme unifying three umbrella schemes of the **Department of Science and Technology (DST).**

The scheme has three broad components:
➢ Science and Technology (S&T) Institutional and Human Capacity Building,
➢ Research and Development and
➢ Innovation, Technology Development and Deployment.

These three schemes have been merged into the unified scheme 'Vigyan Dhara'. This initiative, managed by the Department of Science and Technology (DST), is **designed to enhance India's S&T capabilities through a streamlined approach.** The proposed outlay for the implementation of the **unified scheme 'Vigyan Dhara'.** The merger of the schemes into a single scheme would enhance efficiency in fund utilization and establish synchronization among the sub-schemes/programs. The **primary objective of the 'Vigyan Dhara' scheme is to promote S&T capacity building as well as research, innovation, and technology development towards strengthening the Science, Technology and Innovation ecosystem in the country.**

Components:

- The scheme endeavours to **promote research in areas such as basic research** with access to the international mega facilities, translational research in sustainable energy, water, etc. and **collaborative research through international bilateral and multilateral cooperation.**
- It will also contribute to **building a critical human resource pool to strengthen the science and technology landscape** and expand the R&D base of the country towards improving the Full-Time Equivalent (FTE) researcher count.
- Focused interventions will be taken up to enhance the participation of women in the field of S&T with the ultimate goal of bringing gender parity in Science, Technology, and Innovation (STI).
- All the programs proposed under **the 'Vigyan Dhara' scheme would be aligned with the 5-year goals of DST towards realising the vision of Viksit Bharat 2047.**
- The R&D component of the scheme will be aligned in line with the **Anusandhan National Research Foundation (ANRF).**

2. Virupaksha Temple:

The **Virupaksha Temple in Hampi, Karnataka**, has been in the news due to concerns over the conservation efforts at this UNESCO World Heritage Site, particularly after a **temple pavilion, saalu mantapa, collapsed during heavy rains in 2024.**

Historical significance:

- **Dedication:** The temple is dedicated to **Lord Virupaksha**, a form of Lord Shiva.
- **Location:** It is situated in **Hampi, within the Vijayanagara district of Karnataka**, the temple is part of the larger Group of Monuments at Hampi, a UNESCO World Heritage Site since 1986.
- **Inception:** The temple has been in continuous operation since its inception in the 7th century AD, making it one of India's oldest functioning temples.
- **Development:** Originally a modest shrine, the temple was expanded to its current grandeur during the reign of the Vijayanagara kings, with further additions from the **Chalukyan and Hoysala eras.**

Architectural features:

- **Style:** The temple is built in **the South Indian architectural style**, showcasing intricate craftsmanship and advanced engineering.
- **Main structure:** The temple complex includes a sanctum sanctorum, multiple pillared halls (the most elaborate being a hall with 100 pillars), **antechambers, and grand gopurams (gateway towers).**
- **Gopurams:** The temple has three prominent gopurams, with **the eastern gopuram being the largest, standing nine storeys tall and 50 meters high.** The other two are smaller gopurams located on the inner east and inner northern sides of the complex.
- **Sculptural details:** The gopurams are adorned with beautiful sculptures of various Hindu deities.
- **Innovative construction:** The temple's design incorporates principles of physics, such as the **Rectilinear Light Theory and the pinhole camera effect.** Mathematical concepts like **fractals, geometry, complex mathematics, and the Fibonacci sequence were also utilized in the construction**. Notably, the temple features an inverted pinhole image of its tower on the inner wall, a remarkable example of ancient engineering.
- **Cultural importance:** The **Virupaksha Temple remains a focal point of religious and cultural activities in Hampi, continuing to attract pilgrims and tourists alike**. Its uninterrupted history of worship highlights its enduring significance in India's spiritual landscape.

3. Unified Pension Scheme:

The Unified Pension Scheme (UPS) was introduced by the **government on August 24, 2024, replacing the 21-year-old National Pension System (NPS)** with a structure closely resembling the Old Pension Scheme (OPS).

- **Guaranteed pension:** It promises government employees 50% of their last drawn pay as a lifelong monthly pension.
- **Dearness relief:** The pension includes a periodic dearness relief hike in line with inflation trends.
- **Family pension:** In the event of a government employee's death, the family is assured a pension equivalent to 60% of the employee's pension.
- **Superannuation payout:** A lump sum payment in addition to gratuity benefits will be provided at the time of retirement.

> **Minimum pension:** A minimum pension of ₹10,000 per month is assured for those who complete at least 10 years of central government service.

The scheme is contributory, requiring Employees to contribute 10% of their salary. The government is to contribute 5% of the salary. The government's contribution may be adjusted based on periodic actuarial assessments to ensure the scheme's sustainability.

4. BHISHM:

4. BHISHM: Bharat Health Initiative for Sahyog, Hita, and Maitri provides compact, mobile medical units for emergency care, designed to deliver medical facilities swiftly and effectively.

> **Compact and organised: Medical supplies and equipment are packed into 15-inch cubical boxes**. These boxes are organized based on injury types and medical needs, making them efficient for quick deployment in emergencies.
> **Transport flexibility:** The cubes are mounted on an adjustable framework, allowing them to be transported via multiple modes, including air, sea, land, and drone. Each cube weighs up to 20 kg and is designed to be carried by an individual.
> **Ease of use and management**: Medicines and equipment are classified, with Radio Frequency Identification (RFID) inventory management and real-time stock updates. Additionally, a dedicated app and a tablet with support for 180 languages are provided for operational instructions.
> **Capacity and Features:** Each BHISHM Cube can handle **around 200 emergency cases, including trauma, burns, fractures, and shock**. The cubes are capable of supporting basic surgeries and can generate their power and oxygen for limited durations.
> **Technological Integration:** BHISHM cubes incorporate Artificial Intelligence (AI) and data analytics for **effective coordination, real-time monitoring and efficient management of medical services.**

5. PM WANI Scheme:

Launch: Initiated by the Department of Telecommunications (DoT) in December 2020.

Objective: To provide affordable, high-speed internet connectivity, particularly in rural and remote areas, through a nationwide public Wi-Fi network.

PM-WANI Ecosystem Components:
> **Public Data Office (PDO):** Sets up Wi-Fi hotspots and provides internet access. No license is required from DoT.
> **Public Data Office Aggregator (PDOA):** Offers authorization, accounting services, and user interfaces for purchasing data plans and monitoring usage.
> **App Provider:** Develops applications to help users locate and connect to nearby PM-WANI hotspots, facilitating easy internet access.
> **Central Registry:** Managed by the Centre for Development of Telematics, maintaining records of App Providers, PDOs, and PDOAs.

Accessing PM-WANI Wi-Fi:
> Users download an app to find available PM-WANI hotspots.
> They can select a network, pay for the service, and access the internet until their balance runs out.

6. Green Shoots:

"Green shoots" is a term used to **describe signs of economic recovery or positive data during an economic downturn.** The term "green shoots" is a reference to plant growth and recovery, when plants start to show signs of health and life, and, therefore, has been employed as a metaphor for a recovering economy. **The term was first used by UK chancellor Norman Lamont to refer to economic growth during the economic downturn in the United Kingdom in 1991**. Particularly after a recession, **green shoots are welcome as symbols of the fact that the economy is slowly treading the path upward.** While there is no consensus on what exactly constitutes green shoots, the improvement in industrial production figures, rise in car sales, developments in the infrastructure sector, including the steadying of prices of cement and steel, have been seen as green shoots.

7. Diamond:

Recently, a **2,492-carat diamond, the second-largest ever found**, has been unearthed in the Karowe Diamond Mine, northeastern Botswana. The newly discovered diamond is second to the 3,106-carat Cullinan Diamond, which was found in South Africa over a century ago. **Botswana, a leading diamond producer, relies heavily on the diamond industry,**

which constitutes **30% of its GDP and 80% of its exports**.

Diamond characteristics:
- **Formation:** Diamonds form in the Earth's mantle and are brought to the surface through volcanic activity. They are found in volcanic landforms like **dykes and sills.**
- **Uses:** Diamonds are utilised in jewellery, industrial cutting tools, and polishing due to their hardness.

Diamonds in India:
- **Panna belt:** Madhya Pradesh
- **Wajrakarur Kimberlite pipe:** Anantapur district, Andhra Pradesh
- **Krishna River basin gravels:** Andhra Pradesh
- **Recent discoveries:** New kimberlite fields in Raichur-Gulbarga districts, Karnataka.

Global diamond production:
- **Botswana:** Key mines include Orapa and Jwaneng.
- **Australia**: Known for coloured diamonds such as pink, purple, and red.
- **South Africa:** Hosts diverse diamond deposits including kimberlite and fissure mining.
- **Synthetic diamonds:** The US is the largest producer of synthetic industrial diamonds.

Global diamond resources:
- **Russia:** Believed to have the largest and richest diamond resources.
- **Botswana:** Leading in value and significant in volume.
- **DRC:** One of Africa's major diamond producers.

8. Project Akashteer
It is a cutting-edge initiative designed to automate air defense control and reporting processes by digitizing them. **It is developed by Bharat Electronics Limited (BEL)** as part of the 'Atmanirbhar Bharat' initiative. It **aims to deliver an unprecedented level of situational awareness and control for the force to ensure the safety of friendly aircraft and engage hostile aircraft in contested airspace**. It will enable monitoring of low level airspace over the battle areas of Indian Army and effectively control the Ground Based Air Defence Weapon Systems.

Sarang systems:

It is an advanced Electronic Support Measure system for helicopters of the Indian Navy. It is **designed and developed indigenously by Defence Electronics Research Laboratory, Hyderabad under the programme Samudrika.**

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1. Polygraph test:
The polygraph test operates on the premise that physiological responses triggered when a person is lying differ from their responses when they are being truthful. During the test, instruments such as **cardio-cuffs or sensitive electrodes are attached to the suspect to measure variables such as blood pressure, pulse rate, respiration, sweat gland activity, and blood flow as questions are posed.**
Evaluation: Each response is given a numerical value to determine whether the individual is telling the truth, being deceptive, or uncertain.

Supreme Court Judgements:
According to the judgment of **the Supreme Court in Selvi & Ors vs State of Karnataka & Anr (2010): Polygraph tests can only be administered with the accused's consent**. Consent must be informed, with the accused having access to legal counsel and a thorough explanation of the test's physical, emotional, and legal implications. **The National Human Rights Commission's Guidelines for polygraph tests, issued in 2000, must be strictly adhered to.** The accused's consent should be documented before a Judicial Magistrate. Any evidence or information obtained through a voluntarily consented polygraph test can be admitted in court.

2. National Quantum Mission (NQM):
The **National Quantum Mission (NQM) is a visionary initiative (2023) led by the Department of Science and Technology** (DST) to fortify India's research and development in the quantum domain. Over the next eight years (2023-2031), the mission **aims to pioneer the development of intermediate-scale quantum computers with 50-1000 physical qubits using cutting-edge platforms like superconducting and photonic technology.**
- **Quantum communication:** It seeks to **establish satellite-based secure quantum communications.** It spans a range of 2000 km within India and

extends to other countries. It seeks to develop highly sensitive magnetometers in atomic systems and precision atomic clocks for timing, communications, and Navigation.

➢ **Quantum materials development:** It will provide crucial support for the design and synthesis of quantum materials such as superconductors, novel semiconductor structures, and topological materials to fabricate advanced quantum devices.

➢ **Thematic Hubs (T-Hubs): To catalyze research and development, four T-Hubs will be instituted in premier academic and national research and development institutes**, with a focus on igniting new knowledge through fundamental and applied research, as well as driving R&D activities forward.

➢ **Applications:** It will find utility across diverse sectors including healthcare, diagnostics, defence, energy and data security.

3. Wular Lake:

Wular Lake is slowly choking up due to the ingress of silt-laden waters gushing in the form of streams from mountains in its catchments. **It is the largest freshwater lake in India and the second largest freshwater lake in Asia. It is located in the Bandipore district of Jammu and Kashm**ir. It is **fed by the Jhelum River**. The lake lies at an altitude of 1,580 m on the foothills of Haramuk Mountain. The **lake basin was formed as a result of tectonic activity**. It is also said to be a remnant of Satisar Lake that existed in ancient times. **This lake also has a small island in its centre called the 'Zaina Lank'. This island was constructed by King Zainul-Abi-Din**. In 1990, it was designated as a Wetland of International Importance under the Ramsar Convention. **The area is important for wintering, staging and breeding birds**. Terrestrial birds observed around the lake include the black-eared kite, Eurasian sparrow hawk, short-toed eagle, Himalayan golden eagle, Himalayan monal, etc. It is an important habitat for fish, accounting for 60 percent of the total fish production within the state.

4. Narcotics Control Bureau (NCB):

It is the nodal drug law enforcement and intelligence agency under the Ministry of Home Affairs, Government of India. It was **constituted on 14th November, 1985, under the provisions of the Narcotic Drugs and Psychotropic Substances Act, 1985 (NDPS Act). It has its headquarters located in Delhi**.

The NCB exercises the powers and functions of the Central Government for taking measures with respect to: Coordination of actions by various offices, State Governments, and other authorities under the N.D.P.S. Act, Customs Act, Drugs and Cosmetics Act, and any other law for the time being in force in connection with the enforcement provisions of the NDPS Act, 1985. Implementation of the obligation in respect of countermeasures against illicit traffic under the various international conventions and protocols that are in force at present or which may be ratified or acceded to by India in the future. Assistance to concerned authorities in foreign countries and concerned international organisations to facilitate coordination and universal action for prevention and suppression of illicit traffic in these drugs and substances. Coordination of actions taken by the other concerned ministries, departments, and organizations in respect of matters relating to drug abuse. It also functions as an enforcement agency through its zonal offices. **The zonal offices collect and analyse data related to seizures of narcotic drugs and psychotropic substances, study trends, modus operandi, collect and disseminate intelligence, and work in close cooperation with the Customs, State Police, and other law enforcement agencies.**

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1. Nuclear Powered Trains:

The **Indian Railways plans to adopt nuclear energy as part of its green initiative to achieve net-zero carbon emissions by 2030.** Indian Railways is actively exploring using nuclear power through captive units as part of its strategy to increase reliance on non-fossil fuel sources. **The first nuclear-powered train movements are expected to focus on circuits served by the Nabinagar Thermal Power Plant, leveraging existing infrastructure to test and expand nuclear energy use in rail transport.** Nuclear-powered trains utilise the heat generated from a nuclear reaction to produce steam, which drives turbines. One turbine powers the train, while another generates electricity for auxiliary systems such as lighting and air conditioning. The **idea of nuclear-powered trains gained attention in the 1950s, especially in the USSR, where it became a goal of the Ministry of Transport.**

Nuclear-Powered Trains Function:

- **Design:** These trains would feature a portable nuclear reactor. The reactor heats a fluid to produce steam, which then powers electric turbines. These turbines generate the necessary electricity to propel the train.
- **Thorium reactors:** Thorium-based reactors are considered for their lower radiation risks compared to other nuclear materials. The design of the reactors incorporates advanced safety mechanisms to minimize risks and prevent potential misuse.

2. Tropical Cyclone:

Typhoon Shanshan has intensified into a "very strong" storm as it approaches Japan's southwestern coast, prompting warnings from weather agencies. These **cyclones originate over warm ocean waters near the equator. Warm, moist air rises from the ocean surface, creating a low-pressure area**. Surrounding higher-pressure air moves towards this low-pressure zone, causing the air to warm up and rise further. As the rising air cools, it forms clouds. This system of spinning clouds and wind intensifies with the ocean's heat. As wind speeds increase, an eye forms at the centre.

Characteristics of a Tropical Cyclone:

- **Calm centre**: The cyclone's centre is typically calm and clear, with very low air pressure.
- **Speed:** The average wind speed is around 120 km/h.
- **Closed isobars:** These cyclones have closed isobars, leading to higher wind velocities.
- **Origin:** They form exclusively over oceans and seas.
- **Movement:** Tropical cyclones move from east to west, are influenced by trade winds, and are seasonal.

3. Eastern Equine Encephalitis (EEE):

It is an **extremely rare but serious and often fatal infection caused by the EEE virus (EEEV)**. It causes encephalitis or inflammation of the brain. EEEV can infect a wide range of animals, including mammals, birds, reptiles and amphibians.

Transmission: The spread of EEEV to mammals (including humans and horses) occurs through the bite of infected mosquitoes that feed on both birds and mammals. Human cases of EEE disease are rare but can cause serious illness.

Symptoms:

It is possible that some people who are infected with EEEV will not develop any symptoms. Symptoms typically appear 4-10 days after being bitten by an infected mosquito. Severe cases of EEE infection begin with the sudden onset of headache, high fever, chills, and vomiting.

Treatment:

There **are no vaccines to prevent EEE infection in people and no specific treatments for EEE disease.** Treatment focuses on supportive therapy, including hospitalization, respiratory support, intravenous fluids, and prevention of other infections.

4. Exotic Species:

Recently, the Union Ministry of Environment, Forest and Climate Change (MoEFCC) has mandated the registration of exotic pets listed under **Schedule IV of the Wildlife Act with state wildlife departments via the PARIVESH 2.0 portal within 6 months.**

- **Definition:** Exotic species re**fer to animals or plants that are moved from their natural habitat** to a new location, often due to human activities.
- **Criteria:** According to the Living Animal Species (Reporting and Registration) Rules, 2024, any individual possessing species listed under **Schedule IV of the Wild Life (Protection) Act, 1972, must report and register them.**
- **Wild Life (Protection) Amendment Act, 2022:** It mandates the registration of the possession, transfer, birth, and death of species listed in the **CITES Appendices and Schedule IV of the Wild Life (Protection) Act, 1972.**

Concerns with Exotic Species:

- **Non-regulation:** Many exotic species are imported and bred in India without proper registration, posing risks such as zoonotic diseases.
- **Pandemic risk:** The unregulated trade and ownership of exotic animals poses a threat of pandemic.
- **Smuggling concerns:** Activists have raised alarms over the increasing smuggling of endangered exotic animals into India, especially from Southeast Asia. Significant seizures have been reported in Assam and Mizoram, with animals like Kangaroos, Koalas, and Lemurs being confiscated.

5. Polaris Dawn Mission:

It will **be the first non-governmental mission to conduct a spacewalk**, reaching an unprecedented altitude of approximately 700 kilometres (435 miles) above Earth. It will also orbit Earth through regions of a highly-charged belt of radiation. **There are two of these "Van Allen Belts", an inner and an outer one.** This altitude surpasses that of the International Space Station (ISS), which orbits at about 400 kilometres.

S**p**acecraft: **SpaceX will provide the Falcon 9 rocket and Dragon capsule for the mission.** The spacecraft will attempt to break the altitude record set by NASA's Gemini 11 mission in 1966, which reached 1,373 kilometres.

Crew and leadership: It is spearheaded by **billionaire entrepreneur Jared Isaacman**, who previously financed and flew on SpaceX's Inspiration4 mission, the first civilian mission to orbit Earth.

6. Van Allen Belts:

Composition: They consist of charged particles trapped by Earth's magnetosphere, which protects the planet from solar storms and cosmic rays. **These belts were first identified in 1958 by the American physicist James Van Allen.**

Location:

Inner belt: It is located **between 680 and 3,000 kilometres above the Earth's surface**, this belt is primarily composed of high-energy protons. It forms due to the interaction between cosmic rays and Earth's atmosphere.

Outer belt: It is situated at altitudes ranging from 15,000 to 20,000 kilometers above the Earth's surface, the outer belt predominantly consists of high-energy electrons originating from the solar wind.

Radiation risks: The spacewalk will expose the crew to higher levels of radiation than those on the ISS.

The **charged particles within these belts can lead to radiation sickness, harm to human tissues, and an increased risk of cance**r. Data collected during this mission will be crucial for future deep-space missions, including NASA's planned 2025 mission to the Moon and Mars.

Significance of the Spacewalk:

➢ **Van Allen belts:** The mission will involve orbiting through the Van Allen Belts, regions of intense radiation that astronauts typically avoid. The ability to navigate these belts is crucial for future missions to Mars.

➢ **Testing new spacesuits:** The four astronauts on board will test new spacesuits developed by SpaceX. **These suits are designed to protect against the heightened radiation found in the Van Allen Belts.**

7. Medical Register (NMR) Portal:

It is a portal of the National Medical Commission (NMC) for the registration of all MBBS doctors eligible for registration in India. **The NMR is mandated under Section 31 of the National Medical Commission (NMC) Act, 2019** which states that the **Ethics and Medical Registration Board (EMRB) of the NMC shall maintain a National Register in electronic form containing the name, address, and all recognised qualifications** possessed by a licensed medical practitioner. NMR will be a comprehensive and dynamic database for all allopathic (MBBS) registered doctors in India. **The uniqueness of the NMR is that it is linked with the Aadhaar ID of the doctors, which ensures the individual's authenticity**. The whole process of registration in NMR is a very simple online process, and all the medical colleges/institutions (including the Institutes of National Importance (INIs), etc.), State Medical Councils (SMCs) are interlinked on the portal. Some data will be visible to the public and others will only be visible to the EMRB in the NMC, SMCs, the National Board of Examinations (NBE), and Medical Institutions (including INIs, etc.), and Registered Medical Practitioners (RMPs) as per the requirements. It **offers a variety of features, including the ability to add additional qualifications, track applications, suspend licenses, and issue NMR ID cards and digital doctor certificates**. NMR will be upgraded and augmented with continuous improvements in the registration process on the portal.

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1. Bureau of Police Research and Development (BPR&D):

BPR&D was set up in **1970 under the Union Ministry of Home Affairs** by replacing the Police Research and Advisory Council.

Headquarters: New Delhi

It was established with a mandate to: Identify the needs and problems of the police in the country.

Undertake research projects and studies, and suggest modalities to overcome problems and challenges and meet the needs and requirements of the police. Keep abreast of the latest developments in the fields of science and technology, both in India and abroad, with a view to promoting the use of appropriate technology in police work.

Over the years, the BPR&D has also been entrusted with the responsibility of monitoring the training needs and quality of training in the States and Central Police Organisations, and providing assistance for the same, as well as assisting the States in the modernization of the State Police Forces and Correctional Administration. **BPR&D has also been tasked to assist the Ministry of Home Affairs and the CPFs, etc., in the development of Standards, Quality Requirements (QRs), etc., with respect to various types of equipment and items pertaining to infrastructure**. More recently, the BPR&D has also been entrusted with the responsibility of anchoring and coordinating the work of the National Police Mission. **The Bureau was initially established with the following two divisions; Research, Statistics & Publication and Development.** On the recommendations of the Gore-Committee, the bureau created a Training Division in 1973. The **BPRD has five Central Detective Training Institutes at Kolkata, Hyderabad, Chandigarh, Ghaziabad, and Jaipur** dedicated to the training of police officers and other stakeholders.

2. National Teachers' Award:

The **purpose of this award is to celebrate the unique contribution of some of the finest teachers in the count**ry and to honor those teachers who through their commitment and industry have not only improved the quality of school education but also enriched the lives of their students. This award is conferred on the exemplary teachers/faculty members of higher education institutions and Polytechnics.

Eligibility: The award is open to all the faculty members of colleges/universities/higher educational institutions/polytechnics in India.

The candidates should satisfy the following conditions:

➢ The nominee should be a **regular faculty member**.
➢ He must have at least five years of **full-time experience (undergraduate or postgraduate level).**

➢ The nominee should not be over 55 years of age as of the last date of receiving the application for the awards.
➢ **Vice-Chancellor/Director/Principal (regular or officiating) are not eligible to apply.** However, individuals who were in such positions, but below 55 years of age and still in active service are eligible.

The winners will receive a medal and a certificate worth Rs 50,000.

3. National Industrial Corridor Development Programme (NICDP):

It is **India's most ambitious infrastructure programme aiming to develop new industrial cities as "Smart Cities"** and converging next generation technologies across infrastructure sectors. **It aims to facilitate investments from both large anchor industries and Micro, Small, and Medium Enterprises (MSMEs)**, serving as catalysts to achieve the government's ambitious goal of $2 trillion in exports by 2030.

Under this programme the newly sanctioned industrial areas are: **Khurpia in Uttarakhand, Rajpura-Patiala in Punjab, Dighi in Maharashtra, Palakkad in Kerala, Agra and Prayagraj in Uttar Pradesh, Gaya in Bihar, Zaheerabad in Telangana, Orvakal and Kopparthy in Andhra Pradesh, and Jodhpur-Pali in Rajasthan**. These sites will soon host state-of-the-art industrial smart cities, each designed to foster a vibrant industrial ecosystem. The proposed industrial nodes would focus on creating regional manufacturing hubs across the country. **The development of these industrial cities is envisioned as greenfield smart cities built to global standards, embodying the 'plug-n-play' and 'walk-to-work' concepts**. This innovative approach ensures that the cities will be equipped with advanced infrastructure designed to support sustainable and efficient industrial operations. **The projects are closely aligned with the PM GatiShakti National Master Plan, which focuses on integrated and seamless multi-modal connectivity.**

4. ANUBHAV Awards:

It recognizes the contribution made by Retired Officials to Nation building while working in Government and to document the administrative history of India by written narratives. **The ANUBHAV Portal, established in March 2015, serves as an online platform for retiring and**

retired government employees to share their experiences. The portal was launched by the Department of Pension & Pensioners' Welfare under the Union Ministry of Personnel, Public Grievances & Pensions.

Objectives:
➢ It aims to create a database of significant suggestions and work experiences.
➢ It **channels the human resource of retiring employees for nation building.**
➢ It aims to enable Ministries/ Departments to take crucial steps while considering useful and replicable suggestions.

Eligibility: To participate in the scheme, retiring Central Government employees/pensioners are required to submit their Anubhav write ups, 8 months prior to retirement and up to 1 year after their retirement.

Thereafter, the write-ups will be published after assessment by concerned Ministries/Departments. The published write-ups will be shortlisted for Anubhav Awards and Jury Certificates. Each ANUBHAV Awardees will be felicitated with a medal and certificate and a Prize of 10,000 rupees, whereas a Jury certificate Winner will be presented with a medal and a certificate.

5. Deepfakes:

South Korea's president recently ordered a crackdown on an epidemic of digital sex crimes targeting women and girls who become the unwitting victims of deepfake pornography. **Deepfakes are synthetic media, including images, videos, and audio, generated by Artificial Intelligence (AI) technology that portray something that does not exist in reality or events that have never occurred**. The term deepfake combines deep, taken from AI deep-learning technology (a type of machine learning that involves multiple levels of processing), and fake, addressing that the content is not real. It can create people who do not exist, and it can fake real people saying and doing things they did not say or do. **Background: The origin of the word "deepfake" can be traced back to 2017, when a Reddit user with the username "deepfakes", posted explicit videos of celebrities.**

Working: They are created by **machine learning models, which use neural networks to manipulate images and videos**. To make a deepfake video of someone, a creator would first train a neural network on many hours of real video footage of the person to give it a realistic "understanding" of what he or she looks like from many angles and under different lighting. Then they combine the trained network with computer-graphics techniques to superimpose a copy of the person onto a different actor. **Deepfake technology is now being used for nefarious purposes like scams and hoaxes, celebrity pornography, election manipulation, social engineering, automated disinformation attacks, identity theft, and financial fraud**. They differ from other forms of false information by being very difficult to identify as false.

1. Keeladi

Terracotta pipelines unearthed at **Keeladi in Sivaganga district**. It proves the knowledge that prevailed in the water management system and could be said that alignment was a key feature in the water management system.

About Keeladi

It is a **Sangam age (500 BCE to 300CE)** site located on the **river Vaigai near temple city Madurai.** The excavations prove that an **urban civilisation existed in the Sangam age.**

2. Krishna Raj Sagar Dam

It is **built across the River Cauvery at Kannambadi (Mandya) during the rule of Wodeyar dynasty**. Named as Krishnaraja Sagara in 1917 after the king Krishnaraja Odeya IV.

Significance: Supply water to the **hydro-electric power station at Shivasamudra**, drinking water to the Mysore City, as well as for a continuous supply of Kaveri water to irrigational purposes.

3. Somalia (Capital: Mogadishu)
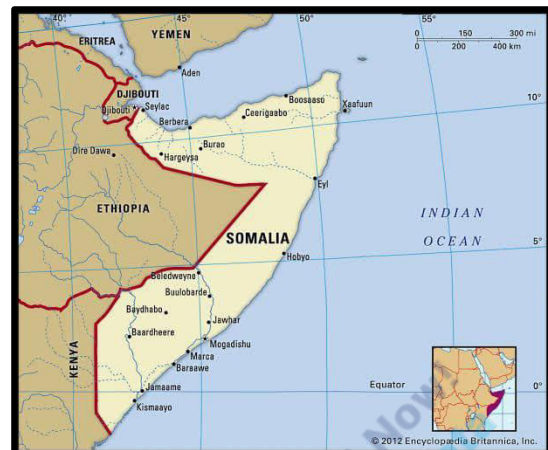
Suicide bombing and gun attack resulted in death of many civilians in Mogadishu.

Political Features

➤ Located on **Horn of Africa, it is the Easternmost country in continental Africa**.
➤ **Bordering countries:** Djibouti (Northwest), Ethiopia (West), and Kenya (Southwest).
➤ **Bordering water bodies:** Gulf of Aden and Indian Ocean.

Geographical Features

➤ **Highest Peak:** Mount Shimbiris, also known as Mount Surud Cad.
➤ **Major Rivers: Jubba and Shabele Coastal plains** parallel to Gulf of Aden are known as Guban.
➤ But region is rich in inselbergs (isolated hill, ridge, or small mountain that abruptly protrudes out from a virtually level surrounding plain).

4. Mullaperiyar Dam

It is a **masonry gravity dam situated on the Periyar River in Thekkady, Idukki district, in Kerala**. It is located 881 m above sea level, on the Cardamom Hills of the Western Ghats. **The dam is built at the confluence of the Mullayar and Periyar rivers. The dam was constructed with limestone and "Surkhi"** (burnt brick powder and a mixture of sugar and calcium oxide). **The dam's purpose was to divert the waters of the west-flowing River Periyar eastward to the arid rain shadow regions of the Theni, Madurai, Sivaganga, and Ramanathapuram districts of Tamil Nadu. The Periyar National Park is located around the dam's reservoir**. Although the dam is located in Kerala, it is operated and maintained by the neighbouring state of Tamil Nadu. It was **according to a 999-year lease agreement made during the British rule that the operational rights were handed over to Tamil Nadu**.

5. Lake Turkana
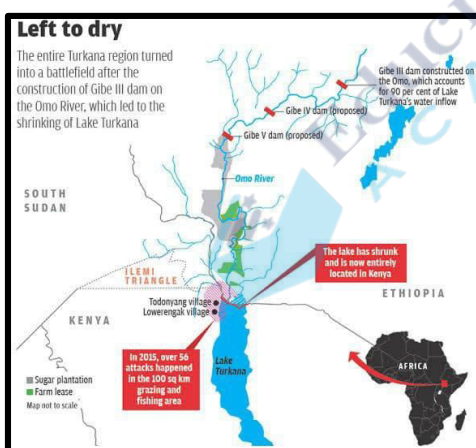
First comprehensive survey held in 50 years regarding Lake Turkana. The **research project is led by UNESCO and World Food Programme (WFP) reveals high fish potential in the lake.**

About Lake Turkana

It is **located in northwestern Kenya and south-western Ethiopia**. It is **Africa's 4th largest lake and the largest permanent desert and alkaline lake in the world**. Over 90% of inflow comes from the Omo River (located in Ethiopia). **The Lake Turkana National Parks site was inscribed on the World Heritage List in 1997.**

Threats: hydro-electric dams and irrigation.

6. Saint Martin's Island
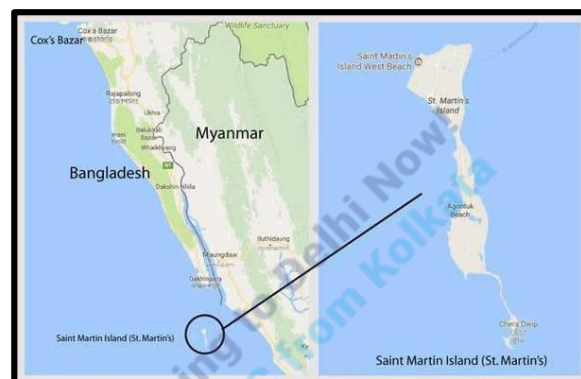
Reports have claimed that the US wanted to establish a military base in St. Martin's Island of Bangladesh.

About St. Martin's Island

A small coral island, located in the northeastern part of the Bay of Bengal. It is **also referred as 'Narikel Jinjira' or Coconut Island, 'Daruchini Dwip' or Cinnamon Island, etc**. Island was once an extension of the Teknaf peninsula but was separated due to the submergence of a portion of the peninsula. **In 1974, Bangladesh and Myanmar reached an agreement that the island would be a part of Bangladeshi territory.**

Geopolitical significance: Located near to Bangladesh and Myanmar

7. Zambia (Capital: Lusaka)
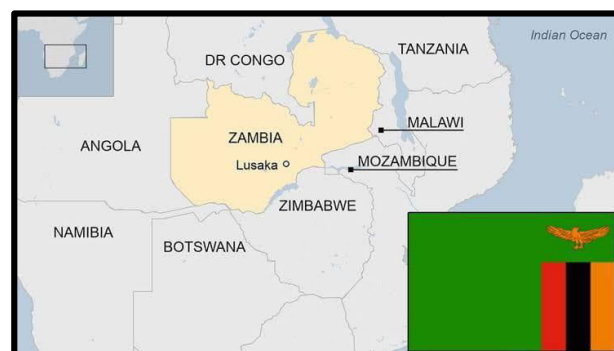
Zambia is set to reopen its closed border with Democratic Republic of Congo (DRC).

Political Features:

➢ Landlocked country in south-central Africa.
➢ **Bordering Countries:** Democratic Republic of Congo and Tanzania to the north, Malawi and Mozambique to east, Zimbabwe and Botswana to the south, and Namibia and Angola to the west.
➢ It is also a **member of the commonwealth**.

Geographical Features:

➢ **Climate:** Subtropical climate with three seasons: a hot and dry season, a wet rainy season and a cool dry season.
➢ **Minerals:** Major producer of cobalt and copper.
➢ **Rivers:** Kafue River, Luangwa River and Zambezi River (Creates Victoria fall).
➢ **Lakes:** Lake Bangweulu, Lake Kariba, Lake Mweru & Lake Tanganyika.

8. Guam Island

Guam is the largest and southernmost island in the Mariana Islands chain, situated in the North Pacific Ocean. Formed by two former volcanoes, it's a tropical island. In **1898, after the Spanish- American War, Spain ceded Guam to the US.**

Indigenous people: Chamorros

Endemic Bird Species: Guam kingfisher, Rota white-eye, and the Guam rail

9. Banni Grasslands

It is located along the northern **border of Kachchh district in the state of Gujarat**. The Banni is also home to **22 ethnic groups, the majority of whom are pastoralists.**

It is **home to great biological diversity, having 37 grass species, 275 bird species**, and domesticated animals like Buffalo, Sheep, Goat, Horses and Camel, as well as wildlife. The **Kutch Desert Wildlife Sanctuary and Chhari Dhand Conservation Reserve are part of the Banni Grasslands.**

Flora: The vegetation here mainly comprises Prosopis Juliflora, Cressa critica, Cyperus spp, Sporobolus, Dichanthium, and Aristida.

Fauna: It is home to mammals such as the Nilgai, Chinkara, Blackbuck, Wild boar, Golden Jackal, Indian Hare, Indian Wolf, Caracal, Asiatic Wildcat and Desert Fox etc.

10. Kamchatka Peninsula

A powerful earthquake in Russia's Far East triggered the Shiveluch volcano in the Kamchatka Peninsula.

About Kamchatka Peninsula

Political Features: Part of the Far Eastern Federal District of Russian Federation.

Kuril Archipelago extends from the southern tip of Russia's Kamchatka Peninsula to the northeastern

coast of Japan's Hokkaido Island. **Kuril Island is disputed between Russia and Japan**.

Geographical Features:

➢ **Location:** Lies between the Sea of Okhotsk on the west and the Pacific Ocean and Bering Sea on the east.
➢ **Mountain ranges:** Sredinny and Vostochny.
➢ **River:** Kamchatka River
➢ **Climate:** Mostly Tundra Climate
➢ **Tribes:** Koryak, Chukchi, and Kamchadal.

11. Marshyangdi River

A tourist bus plunged into the Marshyangdi River, killing at least 14 Indians.

About Marshyangdi River

It is a snow-fed perennial Himalayan River in Nepal with a length of about 150 km. The **Marshyangdi is a major tributary of the Gandaki River, which joins the Ganga river at Hajipur near Patna**. The Gandaki River is known as the Narayani in the plains of Nepal and as the Gandak in India. It is **famous for river rafting, and several hydro-projects have been constructed on the river.**

12. Sudan (Capital: Khartoum)

Dam collapses in **eastern Sudan after heavy rainfall claims multiple lives.**

Political features

➢ **Land Borders:** by Egypt (north), Eritrea and Ethiopia (east), South Sudan (south), Central African Republic and Chad (west), and Libya (northwest).
➢ **Maritime Border:** Red Sea (east).

Geographical features
➢ **Highest point:** Deriba Caldera (Crater Lake) at Jebel Mara.
➢ **Major Rivers:** Nile, Tekeze etc.
➢ **Climate:** Varies from north to south. Northern part is a desert climate, receiving little rainfall, shifting to semi-arid and then tropical savannah towards south.

13. Amrabad Tiger Reserve (ATR):

Location: It is **located in the Nagarkurnool and Nalgonda districts in the southern part of Telangana**. ATR covers a part of the Nallamala Forest, which is part of the Eastern Ghats chain. Spread over 2611.4 square kilometers, it is one of the largest tiger reserves in India. It is the **second-largest Tiger Reserve in terms of core area.**

Earlier, it was part of 'Nagarjunasagar-Srisailam Tiger Reserve, but post-state bifurcation, the northern part of the reserve was vested with Telangana state and renamed 'Amrabad Tiger Reserve'. The southern portion continues to be 'NSTR' with Andhra Pradesh. Major reservoirs like the Srishailam Dam and Nagarjunsagar Dam are fed by the river Krishnaand its several perennial streams that originate in the ATR. The **Chenchu tribe is one of the major tribal communities that live in the ATR.**

PRELIMS & MAINS EDUBYTES

1. Landslides
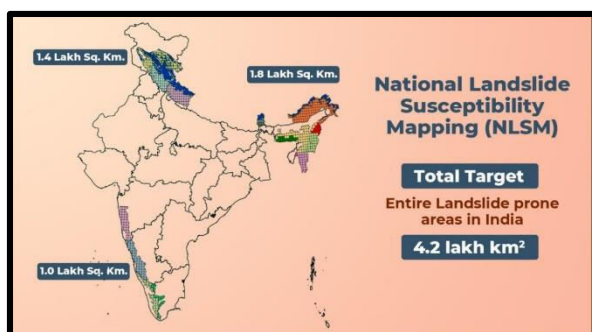
Landslides occur when **gravity forces pushing on hill slope material exceed the frictional forces holding the material in place, causing slope failure.**

Approx. **0.42 million sq. km (12.6% of land area), excluding snow covered area, is prone to landslide hazard** in India. (Source-GSI)

Causes

1. **Fragile Ecosystem**: Tectonic or neo-tectonic activities, associated with numerous subsurface processes
2. **Climate-induced excessive events** like **freezing/thawing and heavy rain/snow precipitation** lead to avalanches, landslides, debris flow etc.
3. **Anthropogenic Factors** such as road construction, tunneling, mining, quarrying, deforestation etc .
4. **Geological Composition**: Some of the Himalayan rocks are made of limestone, which is more prone to water and landslides

Challenges in Monitoring: Unlike other disasters that are largely controlled by macro or regional factors, B. Hence, gathering information & monitoring the possibilities is a challenge.

Way Forward

1. to develop **resilience against geo-hazards caused** by **natural processes, environmental degradation, and human activities**
2. **Leveraging Technology for Effective Monitoring:** Web-based sensors such as rain gauges, piezometers etc
3. The **development of an integrated Early Warning System (EWS) using AI and Machine Learning (ML)**

4. **Simulating and assessing hazard scenarios**
5. **Protecting the region's ecosystems** is a priority.

Initiatives

1. **National Landslide Risk Management Strategy** (2019) by National Disaster Management Authority **(NDMA)**
2. **National Landslide Susceptibility Mapping (NLSM)** Programme, under it GSI has completed landslide susceptibility mapping.
3. IIT Delhi created the first hi-resolution Indian Landslide Susceptibility Map (ILSM).
4. Recently **National Landslide Forecasting Centre (NLFC) has been launched in Kolkata, It will operationalize the regional Landslide Early Warning System (LEWS) nationwide by 2030**

2. IT Outage
Microsoft CrowdStrike Outage caused worldwide IT disruption last week.

Impact of IT outages

1. **Economic disruption**: **Freezing of financial markets, shutdown of businesses** etc. e.g., In 2021, major outage in NSE outage halted trading for nearly 4 hours.
2. **Healthcare: Disruption of telemedicine services,** inaccessible digital health records etc. e.g. 2017 **Wannacry Ransomware attack on Hospitals in UK**
3. **Government and security**: e.g., 2020 cybersecurity breach at Kundankulam Nuclear Power Plant
4. **Others:** C**ommunication breakdown, energy sector disruptions due to failure of smart grids** etc.

Vulnerability of digital infrastructure in India

1. **Import dependence**: Heavy reliance on imported hardware & software
2. **Large digital footprint with low digital literacy**
3. **Others**: **State-sponsored cyber-attacks, lack of robust cybersecurity protocols**

Measures taken

1. **National Critical Information Infrastructure Protection Centre** (NCIIPC), **CERT-In**, etc.

2. **IT Act, 2000** 3. **National Cyber Security Policy,2013**

3. Legislative Impact Assessment
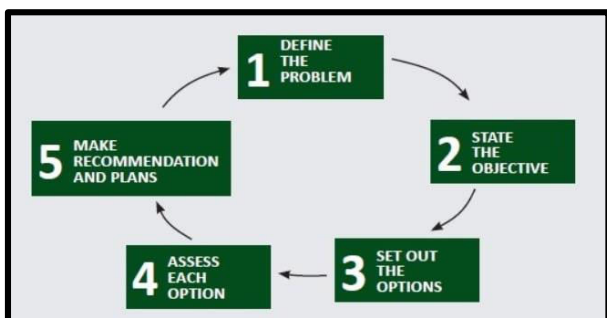
Supreme Court highlighted need for continuous Legislative Assessment LIA is a systematic approach to analyze the positive and negative effects of proposed and existing legislations

Components: problem identification, exploring choices, comparative analysis, stakeholder consultations, socio economic analysis, impact assessment and reporting, etc.

Need for LIA in India
1. Evidence-based policymaking
2. **Policy predictability and coherence** to ensure that new laws align with existing legislations & international commitments.
3. **Absence of sunset clauses** leads to under reviewed, outdated regulations.

Challenges
1. **Absence of institutionalized framework, sub-optimal interdepartmental coordination** etc.
2. **Currently, no such institutionalized study** is conducted to analyse
3. Sometimes, the hasty passage of laws by the **bureaucracy creates various hurdles**

Existing mechanism in India: Standing Committees of Parliament, Finance Commission, NITI Aayog etc.

4. Women in Entrepreneurship
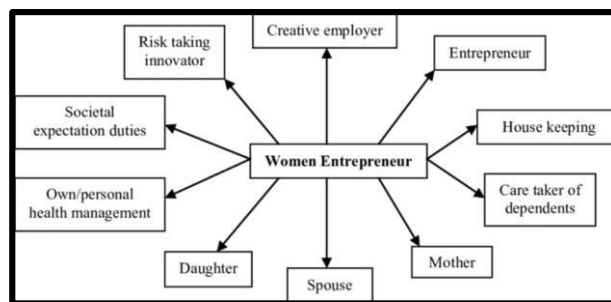
Women Entrepreneurship Program launched by NSDC aims to empower 25 lakh women entrepreneurs with skill, knowledge, resources & financial grants.

Significance of Women Entrepreneurship
1. Economic: Job creation (**women led enterprises could create around 170 million jobs**, NITI Aayog) **Increase in GDP** & **foster innovative business practices**
2. **Social:** Empowerment (**breaking gender norms & stereotypes**); Enhanced education, awareness etc.
3. **Political:** Policy advocacy, fostering strong women agency
4. **Cultural: Participation in traditional crafts** & arts can advance India's cultural heritage

Challenges
1. **Gender gap** in access to finance & **male dominated** family structure
2. **Social cultural barriers dual burden** of balancing work & house work
3. Others: **lack of literacy, safety at workplace, access to advanced technology** etc.

Initiatives for fostering Women Entrepreneurship
1. **Mudra Loans:** with n**o collateral required for upto 10 lakh loans**
2. **Stand-Up India**: financing Women Entrepreneurs

5. Hunger Strikes-Ethical evaluation
Hunger strikes are a form of protest involving the voluntary deprivation of food, sometimes also water

Arguments in Favour
1. **Personal Autonomy, Freedom of Choice & Expression**
2. **Hunger strikes are a form of non-violent protest** can be ethically preferable to violent resistance
3. By **choosing to suffer personally rather than inflicting suffering on others**, hunger strikers can claim the moral high ground

4. **Hunger strikes have been used effectively in various historical contexts**

Arguments Against

1. **Self-Harm:** Hunger strikes involve deliberate self-starvation which can lead to serious health consequences
2. Many ethical frameworks, including **religious & philosophical traditions emphasise the importance of preserving life**
3. Hunger strikes **can be seen as a form of coercion, pressuring authorities** or the public **to meet the protester's demands**
4. **Medical Ethics**: Healthcare professionals may face conflicts between respecting patient autonomy & their duty to preserve life

6. Great Nicobar Project
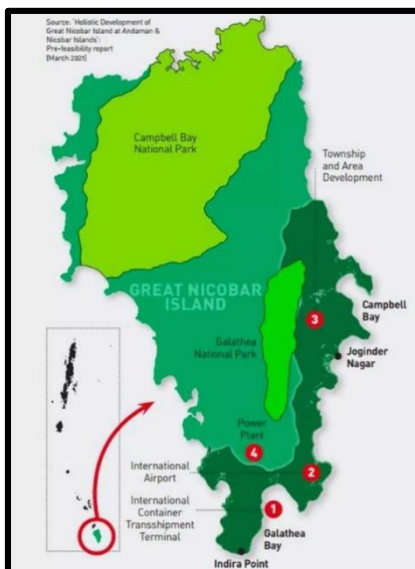
Initially flagged for potentially falling within a no-go zone the project has now been deemed permissible by a high-powered committee appointed by the NGT

Significance of GNP

1. **International Container Trans-shipment Terminal expected to bolster economy.**
2. Positioned near the **Malacca Strait, a key route connecting the Indo-Pacific region**
3. **Greenfield International Airport Facilitating global connectivity**
4. **New township development that may include a Special Economic Zone**

Concerns

1. The de-notification of the Galathea Bay Wildlife Sanctuary a& the declaration of **a "zero extent"**

eco-sensitive zone for Galathea National Park threaten critical habitats

2. The S**hompen & Nicobarese tribes, primary inhabitants of the island face significant displacement & cultural disruption**
3. Great Nicobar rests on **a major fault line & is prone to earthquakes and tsunamis**
4. EIA report lacks compliance with several Terms of Reference and fails to address critical environmental

Conclusion: A comprehensive and transparent EIA should be conducted by an independent body to assess the project's full environmental and social implications before any further development

7. India-West Asia Ties

India's stake

1. **Energy security: Gulf-West Asia- North Africa region contribute over 2/3rd of India's total imports of crude oil**
2. **Diaspora and remittances:** T**here are around 8 to 9 million Indians in West Asi**a who are **sources of inward remittances**
3. **Strategic**: Implementation of projects such as **India Middle-East-Europe Economic Corridor, Chabahar Port etc.**
4. **Trade and commerce: Combined value of trade in west Asia is more than India-US trade**

Issues

1. **West Asia is a volatile and politically tense** region, and India has to navigate these complex geopolitical dynamics
2. **Growing influence of China** is a threat to India's interests

3. The **rise of the Islamic State** and other terror groups has created a threat to the Indian diaspora residing in West Asia.

4. Recent escalation of tensions between Iran and Israel, following assassination of leaders of Hamas and Hezbollah has created a risk of war (has spurred the US and other regional powers to step up diplomacy to prevent an all-out war in West Asia. India, however**, faces a foreign policy dilemma** as it has key interests to pursue with both the countries.

India should continue **the policy of de-hyphenation**-emphasizes on separate and independent diplomatic relations, between two countries having adversarial relations, based on merit

8. Coastal Erosion

Causes

NATURAL	ARTIFICIAL
a) Action of breaking waves	a) Construction of unplanned structures
b) Effect of severe cyclonic storms	b) Reduction of sediment supply due to damming of rivers
c) Rise in sea level	c) Removal of sand from beaches
d) Deflation	d) Dredging of inlet channels
e) Tidal current	e) Unplanned reclamation

Recent study of National Centre for Coastal Research suggests that 34% of the coast is eroding, 28% is accreting and 38% is in a stable state.

Impacts
1. **Erosion can lead to the loss of valuable coastal land affecting property and infrastructu**re
2. **Erosion can destroy coastal ecosystem (mangroves, salt marshes)**
3. **Erosion can reduce the natural barriers that protect coastal areas from flooding**
4. **Erosion can force communities** to relocate, leading to social and economic disruption
5. **Salt Water Intrusion can lead to the salinisation of agricultural land**

Way Forward
1. **Strategic planting of seagrass & other coastal plants** helps prevent erosion
2. **Nature-based or "green infrastructure" protection measures** enhance the natural ability of shorelines
3. **Coastal Restoration**
4. **Regulatory Measures**: Zoning laws, building codes & maintaining minimum distance from the shoreline

Initiatives Taken
1. **Shoreline Mapping** System by NCCR
2. MoEFCC has **defined the hazard line** to indicate shoreline changes and sea level rise.
3. **Coastal Regulation Zone (CRZ) Notification 2019**

9. Geo-thermal Energy
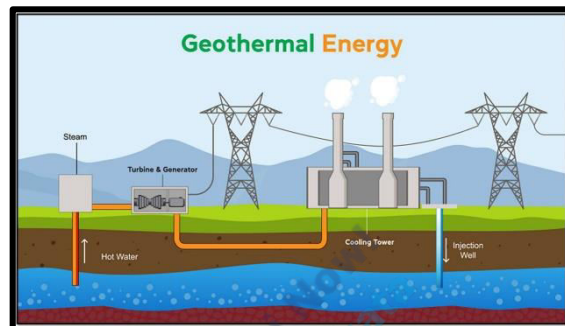
Geothermal Power **Potential of 10,600 MW identified in India**- Minister of MNRE Geothermal Energy is **renewable heat energy generated & stored in earth.** Geothermal technology extracts this energy/ heat for direct heating and cooling, or convert it into electricity.

Advantages of Geothermal Energy
1. **Clean & inexpensive** renewable energy
2. **Ability to operate year-round at high capacity factors**
3. **Power source in areas outside of grid connections**
4. Power production **without importing fuel**

Disadvantages
1. **Possible land subsidence,** high transportation charges of energy (Due to remote plant location).
2. **Possible release of toxic chemicals e.g. mercury, arsenic, boron, and antimony.**
3. **Other Issues**: Higher capital costs, techno-economic viability issue due to remote location

Steps Taken
1. Renewable Energy Research & Technology Development Programme (RE-RTD)
2. 100% financial support by MNRE to **government/non-profit research organizations and up to 70% to industry, startups etc.**

10. Bangladesh Crisis
PM resignation has led to **political vacuum & uncertainty in Bangladesh**. Protests also witnessed some anti-India sentiments due to India's long support for the dismissed government

Possible Impacts

1. **Current instability may impact existing rail, road, and trans shipment and other infrastructure projects**

2. **Border Management and illegal Migration**

3. **Economic uncertainty, violence & security concerns in border areas**

4. This political uncertainty may lead to potential **disruption to regional security and counterterrorism efforts**

5. China Factor, **unlike current regime, opposition in Bangladesh is largely pro-Pakistan & pro-China.**

Way Forward

1. **Shared intelligence and coordinated operations** can disrupt illegal networks

2. I**ndia needs to develop a proactive diplomatic strategy** to engage with the new government

3. **India should draw lessons from its past experiences with political transitions in the region**

11. Renewable Energy

The Importance of Renewable Energy in a Sustainable Future
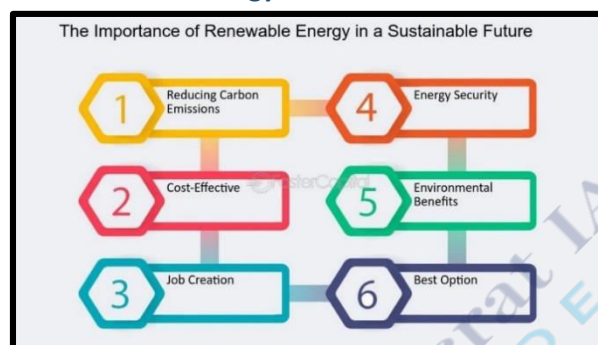
India's **RE capacity increased by 165%** over the last decade-MNRE

Current Status of India

1. **Ranks 4th globally in RE capacity.**

2. **4th in Wind Power** (46.65 GW) capacity & **5th in solar photovoltaic power** (85.47 GW).

3. **First time crossed 200 GW** capacity from non-fossil fuel sources.

Steps taken to achieve this growth

1**. FDI, permitted up to 100%** under the automatic route.

2. **Waiver Inter State Transmission System** charges of Solar/wind projects, green hydrogen, offshore wind projects

3. **Dedicated programmes: PM-KUSUM, PM Surya Ghar Muft Bijli Yojana**

Challenges in growth of RE

1. **Legacy infrastructure costs & high transmission and distribution losses trap discoms in coal dependence**

2. **Grid Reliability & high Cost of Transition**

3. **Low access to low-cost financing**

4. **Energy Storage capacity is low** & expensive for RE which is an intermittent sources of power supply

Way Forward:
Promote Hybrid wind and solar plants, focusing on new Energy-Storage Systems like Pumped Storage Hydropower, etc.

12. Technology in Disaster
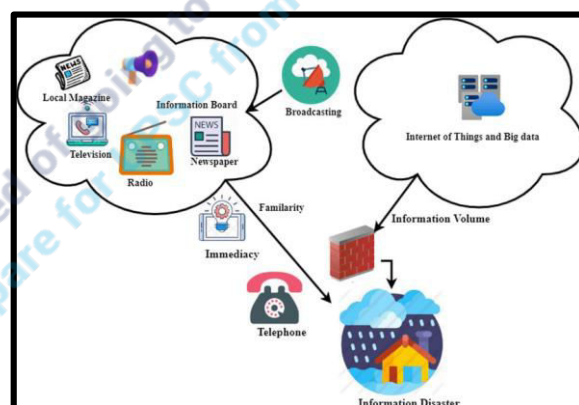
Advancement in geospatial technology based on **AI, ML & IoT have been widely used in disaster & risk management**

Use of Technologies

1. **Disaster prediction & EWS**: Remote sensing, ML, GIS or drones can be used to collect & process data.

2. **AI is used for disaster modeling**, usually through deep learning. E.g. Google Disaster Alerts

3. Event simulation is to prepare & train people. e.g. Usage of AR & VR

4. Search and rescue: Identify people in critical need through satellite imagery or **social media posts**.

5. Use of drones for Delivery of Medical Supplies and Aid etc.

6. Emergency communication: AI powered chatbots can be powerful tools for managing & communicating with public. E.**g Covid-19 chatbots launched by WHO**

Challenges in use of Technology:
Digital Divide, Biased AI, High implementation costs

Steps taken

1. **Forecasting of Natural Disasters by ISRO:** Flood Early Warning System in Assam

2. **INSAT-3D satellite**: Will aid search and rescue needs

3. **SATARK** web based Platform: By Odisha

13. 5th Anniversary of Abrogation of Article 370

A **presidential order abrogated A370 & Jammu and Kashmir Reorganisation Act, 2019 divided Jammu and Kashmir into 2 Union Territories of Jammu and Kashmir and Ladakh**.

Need to Abrogate Article 370

1. **Integration and Development:** The revocation of Article 370 enabled better access to resources, infrastructure development, and economic opportunities

2. **Improved control and stricter security** measures by the Indian government enhanced national security and counter-terrorism efforts

3. **Ending Discrimination**: Equal rights and opportunities were ensured for women, Dalits, and other marginalised groups

4. **Legal Uniformity:** The abrogation aimed to **eliminate legal confusion and disparities by applying uniform laws across India**

5. **Political Stability:** The move aimed to foster a stable political environment, re-establish democratic processes

Impact of the Abrogation of Article 370

1. **Decline in Violence**: Since the abrogation of Article 370, there has been a significant decline in terror activities, local militancy recruitment, and terrorist killings in J&K

2. **Electoral Participation**: **J&K recorded its highest voter turnout in a 2024 Lok Sabha poll in 35 years, with the Kashmir Valley seeing a 30-point increase from 2019**

3. The region saw an unprecedented **surge in tourism, attracting over 21.1 million visitors** in 2023

4. Since the abrogation of Article 370 in 2019, J&K **attracted Rs 5,656 crore in investments across various sectors.**

5. The government has also invested heavily in infrastructure development in Jammu and Kashmir.

New Challenges that has emerged

1. **Political Instability and Governance Issues**: Detention of over 500 political leaders and communication blackouts

2. **Human Rights Violations:** There has been observed a large number of cases of detentions, excessive force by security, and restricted freedom of expression, fueling local resentment

3. The bifurcation created **administrative issues in Ladakh**, with inadequate infrastructure and governance. The **Ladakh Autonomous Hill Development Council is demanding inclusion under the Sixth Schedule** and full statehood to gain greater autonomy in development and control over natural resources.

4. **Fears of cultural dilution and demographic changes** due to the influx of outsiders,

14. State sponsored terrorism

State-sponsored terrorism is a term used when a terrorist group receives support from a state.

Why SST is used

1. **Geopolitical rivalry between states:** E.g., During Cold War era, the US and Soviet Union sponsored militant groups opposed to each other's interests

2. **Territorial grievances:** Eg., Pakistan's sponsoring of terrorist groups such as **Hizbul Mujahideen, Lashkar-e-Taiba, etc.**

3. **Ethnic & Religious Support:** E.g., Iran bolstered terrorist groups operating in Syria, including Hezbollah (Shiite Muslim militant group based in Lebanon).

Implications of using terrorism as an instrument of state policy

1. **Lack of consensus and unified global response**: e.g.. Lack of consensus among UN Member States.

2. **Threat to regional and global security:** Due to proliferation of nuclear technology and other weapon of mass destruction to terrorist sponsor states.

3. **Religious radicalization, political instability**

4. Human Rights Violations & disruption of Normalcy

Steps Taken Global

1. **Financial Action Task Force**: Global money laundering and terrorist financing watchdog

2**. UNSC Resolution 1267**: Global list that establishes Sanctions on individuals and groups associated with terrorist organizations.

3**. UN Counter-Terrorism Centre**: Promotes international cooperation in the fight against terrorism and supports Member States in implementing the Global Counter-Terrorism Strategy.

National

1. **FIU-IND**: Set up by India, responsible for processing and disseminating information relating to suspect financial transactions

2. **Weapons of Mass Destruction and their Delivery Systems (Prohibition of Unlawful Activities) Act**

15. Glacial Lake Outburst Flood
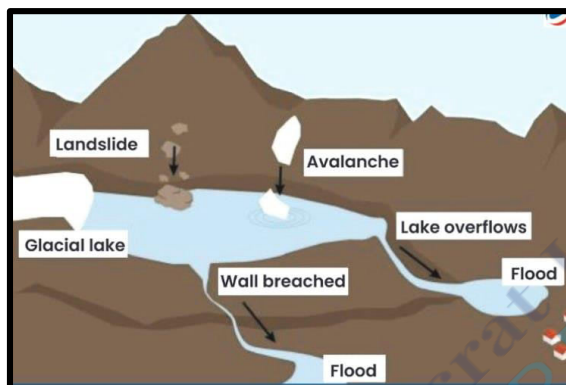
GLOF is a type **of catastrophic flood that occurs when the dam containing a glacial lake fails, releasing a large volume of water**

Causes

1. **Climate Change & Glacier Melting**

2. Some glaciers can experience **surges, which are periods of rapid advance and retreat**

3. **Avalanches, rockfalls, or landslides can impact the damming material**, causing it to weaken or collapse

4. **Human activities, such as mining, construction, or deforestation in the vicinity of glacial lakes, can destabilize the natural barriers**

5. **Seismic activity can trigger GLOFs** by weakening the damming material

Way Forward

1. Intense monitoring of meteorological events & data collection

2. **Use of Technology:** A nationwide programme to regularly monitor vulnerable glacier lakes by satellites & drones

3. **Regulation of Construction** of Infrastructure projects in mountains

4. **A comprehensive risk assessment** that accounts for projected temperature rise, changes in precipitation patterns, & land-use changes

16. Transit-Oriented Urban Development
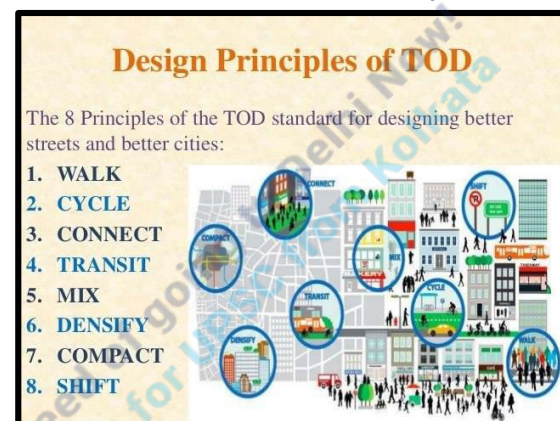
TOD is a **planning strategy that aims to concentrate jobs, housing & services around public transport stations**. The union government proposed a TOD plan for 14 large cities

Benefits of TOD

1. **Reducing Carbon Footprint**: TOD reduces car use, shortens commutes

2. **Boosting Economic Competitiveness**: TOD encourages higher densities & clusters jobs

3. **Vibrant and Livable Communities**: TOD brings jobs, housing, & amenities closer to transit stations, creating lively communities with great public spaces & shorter commutes

4. **Mutual Reinforcement of Compact Urban Development**

Factors Driving Demand for TOD

1. **Rapidly Growing Traffic Congestion**

2. **Dissatisfaction with Suburban areas**

3. **Desire for a Quality Urban Lifestyle**

4. **Reemphasize in family value**

Challenges

1. **Lack of Regional Coordination at the Metropolitan Level**

2. **Separate planning processes for land use & transportation**

3. **Unplanned urban spaces**

4. **Socio-economic Disparities excludes mass integration**

17. MGNREGA

According to the MoRD, work demand under the MGNREGA fell sharply in July 2024

Reason for Decline

1. A **higher enrolment in MGNREGA has a direct correlation with the economic situation of the country**. Work demand under MGNREGA usually drops when better-paying employment opportunities are available due to strong economic growth

2. **The monsoon typically causes large-scale migration of rural workers to villages for crop sowing**, reducing the demand for unskilled jobs

3. **With the economy returning to normal, this form of employment guarantee or safety net for the country's poorest rural households has lesser takers**

Challenges of MGNREGS

1. **Delay & Insufficiency** in Funds Dispersal

2. **Ineffective Role of PRI**: With very little autonomy, gram panchayats are not able to implement this act in an effective manner.

3. **Inclusion & Exclusion errors** in job cards

4. **There has been a delay in the completion of works** under MGNREGA and inspection of projects has been irregular

18. Nutritional Security

It refers to a state where a set of **individuals have access to adequate, safe, & nutritious food** that meets their dietary needs & food preferences for **an active & healthy life.**
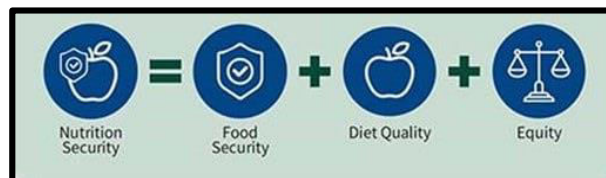
Why is Nutritional Security Necessary

1. **Holistic Health Outcomes:** Nutritional security goes beyond mere calorie intake

2. **Economic Productivity:** Nutritional security directly impacts economic productivity

3. **Adequate nutrition, especially in early childhood, is crucial for cognitive development & educational outcomes**

4. Nutritional security plays a **vital role in building resilience against diseases**

India's Nutritional Challenges

1. **Economic Disparity-The Wealth-Nutrition Gap**

2. India's agricultural policies, largely shaped by the **Green Revolution, have prioritized staple crop production over diverse, nutrient-rich crops**

3. **Climate change poses a significant threat** to India's food security and nutrition.

4. Despite improvements in **literacy rates, nutritional awareness remains low in many parts of India.**

19. India-Maldives ties

The Maldives has recently found itself in the midst of diplomatic turmoil, raising questions about its relations with India

Challenges in relation

1. **Rising Chinese footprints**: Eg construction of the Sinamale bridge, pact for military assistance to Maldives

2. **Rising Anti-India sentiments:** demanding withdrawal of Indian troops from Maldives, India-out campaign

3. **Rise of Religious Radicalism** in Maldives, including Pakistan hacked-terror groups

Significance of Maldives for India

1. Geo-economics: It is located along the major commercial Sea lines of communication

2. **Geopolitical:** it is important in maintaining peace, stability & prosperity in the Indian Ocean Region and enhancing India's Vision SAGAR Le. Security & Growth for All in the Region.

3. It is a **key partner in the Neighbourhood First policy.**

4. **Defence cooperation**: it extends to Joint Exercises (Ex Ekuverin), Maritime Domain Awareness

5. **Historical ties**: Both countries share ethnic, linguistic cultural, & religious links

20. Space Diplomacy

It involves leveraging space science and technology to achieve foreign policy goals and strengthen national space capabilities **India & Nepal signed MoU to provide grant assistance for the launch of Nepal's Munal Satellite**

Significance for space diplomacy for India

1. **Global south cooperation:** building consensus on common space tech for space exploration

2. **National Security**: E.g., The India-US space situational awareness agreement

3. **International cooperation & Capacity building**: to utilise space resources for the expanding population. **UNNATI programme of ISRO**

4. **Conflict free space:** India is committed to using outer space for peaceful purposes and keeping it conflict-free.

Challenges:

Lack of private participation, few missions for deep space exploration, lack of multilateral space partnerships, etc.

India's International Cooperation

1. **India-US:** India joined the Artemis Accord, NISAR satellite

2. **India-Russia:** Cooperation for the human spaceflight programme.

21. Global Employment Trends for Youth by ILO

Global youth unemployment rate in 2023 is 13%, the lowest in 15 years

Global Challenges

1. **4 in 5 young adult Inequalities of Opportunity:** workers are in regular paid job in high-income countries, compared to 1 in 5 in low-income countries.

2. **Regional disparities:** Growth in youth labour force in Africa by 2050 while all other regions face contraction.

3. **Youth well-being concern**: Many young people are stressed about job loss, state of economy & lack of social mobility across generations.

4. **Educational Mismatch:** 2 in 3 young adult workers in developing economies hold qualifications that do not match well to their job

Recommendations

1**. Enhance education & training** to improve school-to-work transitions & **address skill mismatches**

2. **Target labour market policies** to support disadvantaged youth

3. **Promote entrepreneurship and self-employment** among young people.

4. **Amplify the policy focus on job creation through gender- responsive macroeconomic & sectoral policies**

22. Biofuels

Biofuels are the fuel derived from the biomass of plants or animal wastes.
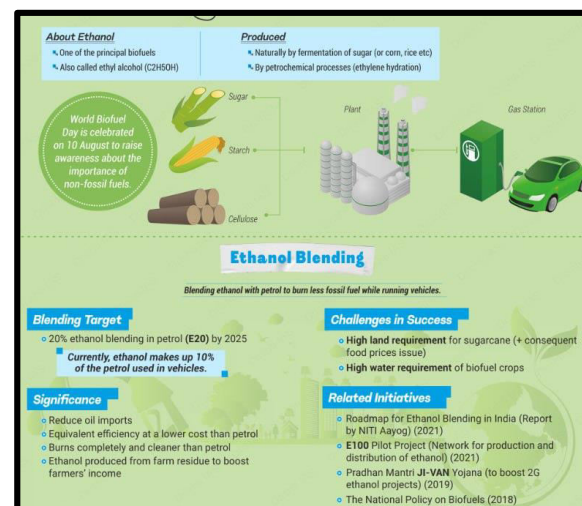
Significance

1. Biofuels are crucial for **environmental sustainability**

2. **India, the world's third-largest crude oil consumer, imports over 85%** of its oil Biofuels **can help improve energy security**

3. Biofuels can **cut India's oil imports** & **import bill, while also boosting farm incomes**

4. Biofuels can be produced from a variety of sources, including crops, waste, & algae

Challenges

1. Producing o**ne litre of ethanol from sugar requires about 2,860 litres of water**
2. There are **concerns about balancing food security with energy security**
3. Ethanol production **needs robust infrastructure for transporting,** storing, & delivering feedstock and fuel
4. Vehicles need modifications to run on ethanol-blended fuels

Initiatives taken

1. **Ethanol Blending Programme**
2. **PMJI-VAN Yojana**, 2019-It aims to boost Second Generation (2G) ethanol production international cooperation

23. UNSC Reforms

G4 nations has recently asserted the needs of UNSC reforms to tackle emerging challenges

Need for reform

1. Lack of representation: Like non representation of Africa, Latin America and the Caribbean, and the under-representation of Asia Pacific in the permanent category.
2. Declining Credibility: Failed in resolving conflicts. E.g. Russia- Ukraine
3. Interest based Decision Making: Veto power pov is used by permanent members to fulfil their interest. E.g. China vetoed Indian resolution for designating certain persons as global terrorist.
4. For India: Enhancing say in global issues, especially related with global south, policy making on issues like terrorism, etc.

Challenges in Reforms

1. **Require amendments** in the United Nations Charter
2. Reforms proposed by G4 and L.69 Group (cross-regional grouping of developing) are opposed by group like Uniting for Consensus (the Coffee Club).
3. **The geopolitical rivalry among the permanent members** has prevented the UNSC

24. Voice of Global South Summit
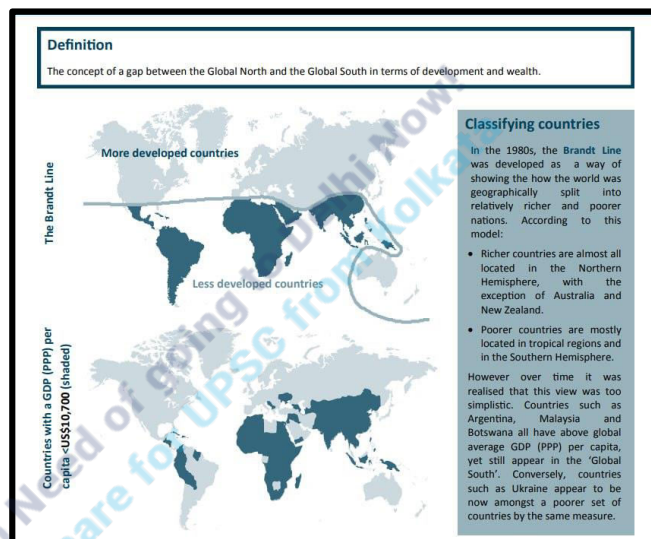
India hosted **3rd VOGSS** to bring together countries with the **philosophy of Vasudhaiva Kutumbakam.**

VOGSS from India's PoV

1. India aims to **represent the underrepresented Global South** in international forums.
2. **Calls for reform in multilateral institutions** like the **UNSC, UN, and IMF.**
3. Emergent economies like India and South Africa **seek cooperation with other Global South countries**.
4. **Challenges the dominance of the Global North** in international affairs.

Challenges

1. **Hegemony of the west led by USA** in international forums
2. **Technology divides** between North & South
3. **Financial constraints of the global south**
4. **Terrorism, Extremism, Separatism & military coups** in global south hinders smooth dialogue

India's initiatives in Global South

1. **Vaccine diplomacy**
2. **Induction of African Union in G20**

3. **Social impact fund for Digital Public Infrastructure in Global South**

25. Lateral Entry

LE **aims to bring in domain-specific expertise & fresh perspectives to enhance governance** by recruiting individuals from outside of the government

Arguments in Favour of LE

1. Lateral entry allows the **government to recruit specialists with expertise** in areas like technology
2. Experience of private helps to **reform & enhance administrative processes**
3. Lateral entry can help **bridge this deficit of personnel**
4. It will help in **bringing change work culture in the Government sector**

Criticisms of LE

1. It can **challenge objectivity & neutrality due to potential conflicts of interest**
2. Could **create a divide between them and permanent officers**
3. Lateral entry might **dilute the merit-based recruitment system**
4. Traditional bureaucrats may resist lateral entrants **due to concerns about hierarchy Lateral entry, like competition in any field, can be beneficial, but it requires careful consideration of entry criteria, job roles, personnel numbers, and training to ensure it drives positive change**

26. Nano Particles

Nano Technology
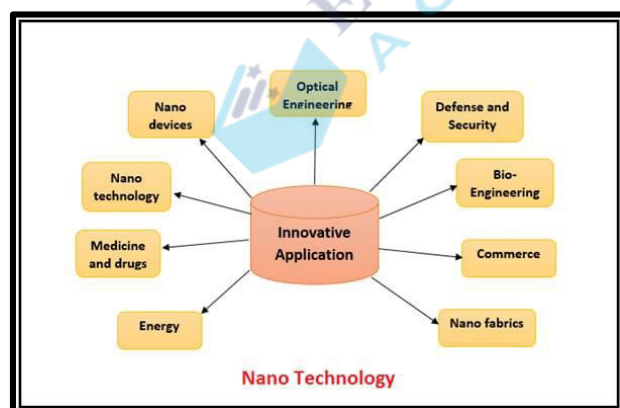
NPs are extremely small particles that are sized **between 1 to 100 nanometers**

Application of NPs

1. **Medicine & Healthcare**– Targeted Drug delivery, better bioimaging & diagnostics, antimicrobial coatings
2. **Electronics-** Nanoelectronics, sensors, data storage devices, quantum dot displays
3. **Food & Packaging**- Antimicrobial films, improved barrier properties, moisture control & thermal stability
4. **Environment**- Pollutant degradation, water treatment, nano-filtration
5. **Agriculture**- Pesticides, fertilizers, pathogen detection, encapsulated agrochemicals.
6. **Aerospace**- Lighter and stronger composites, structural health monitoring

Concerns associated with NPs

1. Inhaled nanoparticles **can deposit in lungs, causing inflammation, fibrosis, asthma**.
2. Nanoparticles in cosmetics & sunscreens may be **absorbed through skin & enter bloodstream**
3. Nanoparticle emissions into the air **reduces air quality**
4. **Bioaccumulation** up food chain
5. **Runoff from landfills. Alters microbial communities in soil.**

27. India-Malaysia Relations

India and Malaysia elevate ties to **Comprehensive Strategic Partnership**

Convergence in interest

1. Malaysia hosts approximately **2.7 million Person of Indian Origin**
2. **Bilateral trade:** Reached to **US$19.5 billion**
3. **Defence**: India Malaysia Defence Cooperation Meeting (MIDCOM), Exercise Harimau Shakti etc
4. Malaysia agreed **to support and expedite the review process of ASEAN-India Trade in Goods Agreement (AITIGA)**
5. Countries have decided to a**ccelerate collaboration in Digital Public Infrastructure** through **Malaysia-India Digital Council**

Challenges in ties

1. Malaysia's r**ejection of repeated India's request for extradition of Zakir Naik**, who is wanted in India on hate-speech and money laundering charges
2. Malaysia's **strong criticism of Indian Government's Policies** like the Citizenship Amendment Act

3. The economic relationship faces challenges such as **higher import tariffs and trade restrictions**

4. The **increase in Chinese influence** in the politics and economy of Malaysia

28. Regional Rural Banks
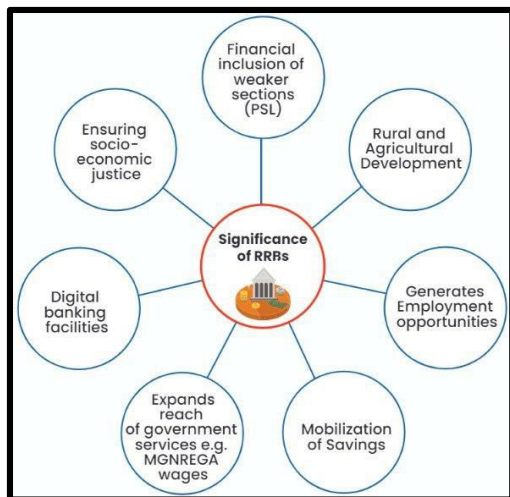
Union Finance Minister chaired Review Meeting of the RRBs & suggestions included focus on improving business performance, upgrading digital technology services etc.

Issues with RRBs

1. **Lack of coordination in Branch expansion**: Results in inequitable distribution

2. **Inadequate finance**- They are dependent on NABARD to collect finance for their further operation

3. **High overdues & poor recovery of loan**

4. **High attrition rate due to availability of more attractive jobs**

5. **Loans by Commercial Banks are more attractive due to lower interest rates** for weaker sections

Way Forward

1. **Structural consolidation to improve efficiency**

2. **Recapitalization of RRBs** for capital augmentation.

3. **Periodic review and capacity building** of human resources

4. **A uniform pattern of interest rate structure should be devised** for the rural financial agencies

5. The RRB must **strengthen effective credit administration by way of credit appraisal, monitoring the progress of loans and their efficient recovery**.

29. E-commerce

It is the **process of buying and selling goods & services online**.

Positive impact of e-Commerce

1. e-commerce, **comprising 7.8% of total retail sales in 2022 is growing at a CAGR of 27% between 2018 and 2030**

2. Results in Consumer welfare gain **due to convenience, cost effectiveness etc**

3. It has also **increased employment particularly for women**

4. Government initiatives such as the **National Logistics Policy** streamlines deliveries to the last mile, **enhancing logistical efficiency and cost-effectiveness**

Concerns:

1. Predatory pricing: e-commerce platforms can offer deep discount to get rid of competitors & take over the market which can wipe of the initial cost benefits

2. Loss of employment: Due to less competition & impediment of traditional retail sector.

3. Privacy issue: Abuse of consumer data & privacy

4. Breach of law. For example, currently some e-commerce platforms (like amazon) in India are engaged in direct sales to consumer sales, despite regulatory restrictions on B2C transactions.

30. 5 years of Jal Jeevan Misson
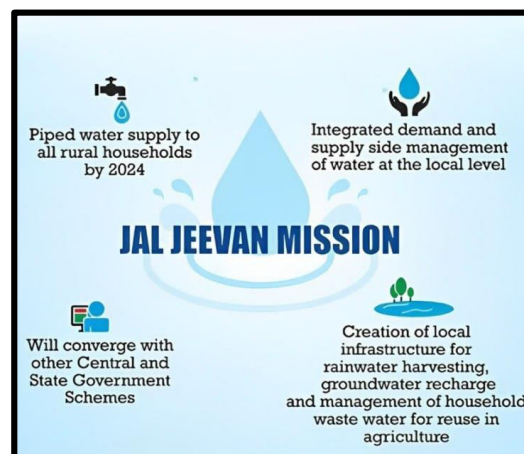
It was launched in 2019 to provide Functional Household Tap Connections to **all rural households by 2024** with service level at the **rate of 55 litres per capita per day.**

Key Achievements

1. Tap water coverage increased from 3.23 Crore **to around 15 Crore households**
2. **8 states and 3 Union Territories achieved 100% coverage.**
3. **2.28 lakh villages and 190 districts achieved 'Har Ghar Jal' status.**

Challenges faced

1. Primary challenge is the **inadequate infrastructure** for water supply in rural areas
2. States **like Kerala, and Bengal face issues with water contamination, posing obstacles in ensuring access to safe drinking water**
3. **India's rural areas are diverse in terms of geography and terrain**
4. **Covid 19 and other implementation delays**

Way Forward

1. The need is to **provide training and capacity-building programs for local community** members to operate
2. Changing traditional water-use habits and **promoting responsible water use**
3. I**ndia should work on groundwater replenishing methods**

31. Fixed Dose Combination Drug

Health Ministry bans 156 FDCs due to the concerns about their irrationality & potential risks to human health

Benefits of the FDC

1. **Targeting multiple disease pathways** leads to improved response rates and rapid actions.
2. **Minimises pill burden:** F**ewer pills ensures greater adherence and better outcomes.** Eg, a single pill for fever, cough, and pain can foster better compliance.
3. **Greater efficacy** compared with higher dose monotherapy
4. **Reduced risk of adverse reaction**s relative to higher dose monotherapy
5. **Lower overall costs**

Concerns with FDC

1. **Physiological or Chemical reaction:** Opposing/Antagonistic combination can lead to enhanced toxicity, reduced efficacy
2. **Decreased Shelf life**: In case of chemical incompatibility between the two drugs.
3. **Growing antibiotic resistance**: Sale of unapproved or banned FDCs containing antibiotics.
4. In comparison to single-component treatments, FDC pharmaceuticals **require more stringent quality control and standardization**

32. BioE3 (Biotechnology for Economy, Environment and Employment)
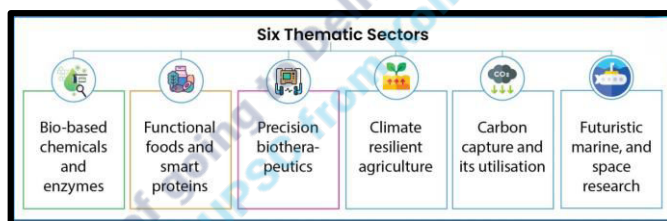
Cabinet approves BioE3 Policy with an aim to foster high-performance biomanufacturing broadly focuses on the six strategic/thematic sectors

Salient Features

1. **Innovation-driven support to R&D** and entrepreneurship
2. A**cceleration of technology development and commercialization** by establishing Biomanufacturing & Bio-AI hubs and Bio- foundry.
3. **Prioritizing regenerative bio-economy** models of green growth.

Benefits

1. Aligned with governmental goals of **'Net Zero' carbon economy & mission LiFE**
2. Accelerated **'Green Growth'** by promoting **'Circular bio-economy'** in India.
3. Policy will foster a future that is **more sustainable, innovative, and responsive to global challenges** and lays down the bio-vision for

Viksit Bharat

Indian Biotechnology sector Valued **at $151.1 billion in 2023 and is projected to reach $300 billion by 2030.** India, with a **3% share of the global biotechnology industry**, is ranked third in Asia and 12th in the world.

33. Left Wing Extremism

LWE will be completely eliminated in before March 2026: Union Home Minister

Current Status of LWE: 38 districts are affected across 9 states as against 96 in 2010 **Most LWE Affected Districts reduced to 12** in 2024 against 35 in 2018.

A map of India's Maoist conflict
A crackdown on Maoist rebels has led to a rise in the number of casualties in the country's tribal areas. Here are the regions that are most affected.
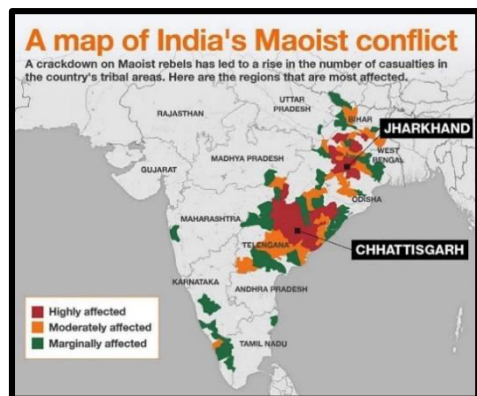
Factors responsible for LWE

1. Socio-economic: Poverty, lack of development, unemployment, Land alienation, social exclusion based on castes, sub-optimal access to basic amenities etc.

2. **Governance issues:** Ineffective implementation of Forest Rights Act & PESA, state-highhandedness, exploitation

3. **Political Factors**: Weak Governance & Lack of Infrastructure, Lack of Coordination between Centre & State Government

Initiatives taken

1. **National Policy and Action Plan (2015) to address LWE which led to development of operational strategy 'SAMADHAN'**

2. **Security Related Expenditure** Scheme implemented in 10 LWE affected States for Security Related Expenditure

3. **Special Central Assistance** for most LWE Affected Districts

4. **Scheme of Fortified Police stations**

34. National Quantam Mission

Mission objectives

1. **Quantum Communication Network**: Secure & high-bandwidth communication infrastructure spanning 2,000 kilometers.

2. **Quantum Computing Power**: Developing quantum computers with a processing capacity of 50-1,000 qubits.

3. **Quantum Materials Design**: For cutting-edge device fabrication.

4. **Establishing four Thematic Hubs:** Quantum Computing, Quantum Communication, Quantum Sensing & Metrology, and Quantum Materials & Devices.

Significance of NQM:

1. By establishing thematic hubs fostering **collaboration, expertise & innovation across diverse sectors**

2. **Applications in Different sectors e.g.** Healthcare and drug discovery, Finance and banking industries etc

3. **Global Leadership**: By developing Secure Communication, Precision Measurement etc

4. **QKD enables future-proof security of communication** networks

Challenges in NQM:

Poor Expenditure on Research, Lack of Private Investment, Delayed progress of NQM, Lack of Skilled Workforce, Lack of Availability of Infrastructure etc

35. 4D Printing

Feature	3D Printing	4D Printing
Definition	A process of creating a physical object from a digital model by layering material in three dimensions.	A process of creating a physical object that can **change its shape or properties over time in response** to specific external stimuli.
Design properties	Design does not change	Colour, Shape, Function, etc change
Material Used	Metals and alloys; nanomaterials; Thermoplastics; Biomaterials and Gels	Shape-memory polymers; Smart materials; Programmable materials; Self-assembled materials etc.
Functionality	The resulting object is typically **static and cannot change its shape** or properties after it has been printed.	The resulting object can change its shape or properties after it has been printed, allowing for **new possibilities** in design and function.
Applications	Widely used in **prototyping**, manufacturing, and customization of products.	• **Construction**: To build structures which would build up themselves or repair themselves in case of weather damage • **Medicine**: To create drugs that are tailored to an individual's biochemical makeup • **Fashion**: Shoes could change their shape when you start running to provide you with better comfort

Indian Researchers Develop **4D-Printed Artificial Blood Vessels** for Advanced Medical Grafts

Applications:

1. **Medical Application**: Drug delivery, tissue fabrication, and organ regeneration etc.
2. **Soft Robotics**: Due to its Flexibility, deformability with respect to Environment.
3. **Aerospace**: By enabling low-cost, durable parts that adapt to extreme conditions. E**.g. Nitinol alloy manufacturing.**
4. **Others**: sensors and flexible electronics, active origami art, self-evolving structures etc.

Advantages

1. **Dynamic Functionality:** By creating adaptive structures beyond the capabilities of traditional 3D printing.
2. **Material Efficiency** by reducing wastages.
3. Complex Design fabrication

Challenges

1. **Unavailability of Technologies**: Limited to few research institutes in the world
2. **Material Limitations**: For e.g. Degradation issues on continuous deformation.

36. Raising the marriage age of women

Himachal Pradesh Assembly passes bill raising marriage age for women from 18 to 21.

Benefits of Raising age of Marriage

1. **Secure Constitutional mandate of Gender Equality**: Age for marriage for men is 21 years

2. **Reproductive Health**: improved physical and psychological health through lower maternal mortality rate, bringing down teenage pregnancies
3. **Women Empowerment**: Better education and employment outcomes
4. **Helps in achieving SDG5 (Gender Equality), SDG10 (Reduced Inequalities).**
5. **Have a ripple effect** on the next generation and beyond
6. Possible case of **more women entering into economic activities**

Concerns

1**. Illegal Marriages**: May push a portion of the population into non-institutional marriages
2. **Negatively impact marginalized communitie**s with high prevalence of marriage at lower ages
3. **Does not address** the social and cultural patriarchal norms
4. **No Assurance** for Eliminating Child Marriages

37. India US relation

Challenges

1. Relations between the US and India have been affected by **concerns over the treatment of minorities**
2. **While both nations see China as a strategic challenge**, their approaches sometimes diverge. I**ndia's economic ties with China occasionally conflict with US interests**
3. **Trade disputes, protectionist measures, and concerns over market acce**ss and intellectual property

rights complicate efforts to reach a comprehensive trade deal.

4. US is concerned with **India's continued and growing partnership with countries like Russia and Iran**

5. **Strategic Decision Making of India regarding to Russia-Ukraine conflict** has been criticized by US and allies.

38. Agriculture Investment Fund

It is a **medium - long term debt financing facility for investment in viable projects for post- harvest management infrastructure and community farming** assets through interest subvention and credit guarantee support.

Features

1. All loans **up to a limit of ₹ 2 crores with interest subvention of 3% per annum**

2. An applicant can put up to **25 projects** in different locations or **Multiple projects in one location** with an overall **cap of ₹2Cr**

3. The moratorium for repayment facility varies from **6 months to 2 years**

4. **24% of total grants–in–aid should be utilized for SC/ST entrepreneurs**

Significance:

1. It **provides support facilities to farmers & value chain actors for risk sharing & market access.**

2. Improved **marketing infrastructure** & investments in logistics infrastructure, **post-harvest losses can be reduced**

3. It include **integrated primary & secondary processing projects in list of eligible activities**

4. **Convergence with Component-A of PM-KUSUM** with AIF leads to greener agriculture

39. Manual Scavenging

Manual scavenging is the **practice of removing human excreta by hands from sewers or septic tanks**.

Challenges associated

1. Workers engaged in manual scavenging come from the **lowest ladder of the caste system**

2. Often the families also fac**e social ostracization and exclusion (Against Article 17)**

3. Workers often enter sewer & pits without proper safety kits & equipments and it **may result into death**

4. **Limitations of mechanization** of scavenging process

5. Large parts of **urban areas in India are still not connected with sewage facilities,** particularly in unauthorised colonies

Steps Taken

1. Enactment of **Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013**

2. Under the **Swachh Bharat Mission near universal conversion of insanitary toilets into sanitary toilets**

3. N**AMASTE Scheme** aims to mechanize the process.

4. **Self-Employment Scheme for Rehabilitation of Manual Scavengers offers: cash assistance of Rs 40,000 to manual scavenger & subsidies for self employment.**

40. Foreign Universities in India

UK's University of Southampton is set to open a campus in Gurugram under National Education Policy 2020 & UGC guidelines

Significance of FUs in India

1. **Cut-down Outflow of Indian Money and Brain Drain**

2. Foreign universities in India may **increase the enrollment ratio by providing more options for higher education**

3. Having foreign universities in India **can foster cultural exchange**

4. India can become **more competitive globally** in terms of education & research

5. **Enhanced competition** in education sector in India

Challenges

1. **Incorporating Indian culture & multilingualism into the curriculum for FUs**

2. The f**ees charged by FUs are often much higher** than those charged by Indian institutions

3. The influx of foreign institutions and students could lead to a **loss of Indian culture & values**

4. Truly reputed higher educational institutions operate on a **not-for-profit basis & have no materialistic motives to go offshore**

41. Atma Nirbharta in Edible oil

Report titled **"Pathways and Strategies for Accelerating Growth in Edible Oils towards Goal of Atmanirbharta"** was released by **NITI Aayog.**

Challenges in the Edible Oil Sector

1. **76% of oilseed cultivation is rainfed**, contributing 80% of total production, making it **vulnerable to erratic weather patterns**
2. India continues to face a **substantial demand-supply gap**, leading to **heavy reliance on imports**
3. **Per capita consumption of edible oils has risen** to around 19 kg annually over past decade
4. Low import duties and high imports have **negatively impacted the price realisation for domestic oilseeds farmers**

Recommendations of Niti Aayog

1. **Enhance Oilseed Development in Bundelkhand & Indo-Gangetic Plain**
2. **Prioritise Wasteland Utilisation for Oil Palm Expansion**
3. Establish **"One Block-One Seed Village"** hubs at block levels for high-quality oilseed supply
4. **Promotion of Biofortified Oilseed Varieties**
5. **Enhancing Yield through Improved Varieties** & **setting up testing laboratories**

42. Best Practices

1. **Human-Animal Conflict**- **The "Gajraj System"** will utilize artificial intelligence to **detect elephants near railway tracks.** This will likely involve cameras and sensors that can identify the presence of elephants and send alerts to railway authorities.
2. **YUVAAi-** The **Youth for Unnati and Vikas with AI (YUVAi) program** is gearing up for a prominent appearance at the ongoing **Global Partnership on Artificial Intelligence (GPAI) Summit in New Delhi**. The program equips students from classes 8 to 12 across India with essential AI skills, preparing them for a future heavily influenced by this technology.
3. **The Gram Manchitra application** is a GIS **based tool developed by the Ministry of Panchayati Raj to support the Gram Panchayat in spatial planning**. The application enables the Gram Panchayat to access various spatial data layers, such as administrative boundaries, natural resources, infrastructure, and socio-economic data.
4. **The NAMO Drone Didi scheme** is a new initiative launched by the central government to empower rural women by providing them with training and employment opportunities in the drone sector.
5. **Mahalaxmi scheme** launched in Telangana provides with free travel for women in RTC bus service.
6. **The AAINA Dashboard for Cities**, launched by the Ministry of Housing and Urban Affairs **(MoHUA),** marks a significant step towards **enhancing transparency and accountability in urban governance across India**. This initiative aims to empower Urban Local Bodies (ULBs) by providing a platform for data-driven performance monitoring and benchmarking.
7. **BIRBAL:** Chandigarh Smart City Limited (CSCL) has launched an **Artificial Intelligence (AI)-driven interactive chatbot named 'BIRBAL' to enhance citizen-centric services.**

EDUFACTS

1ST AUGUST

1. Approximately **0.42 million sq. km (12.6% of land area),** excluding snow covered area, is prone to landslide hazard in India. **(Geological Survey of India (GSI))**

2. Around 340 to 370 million hectares of Earth's surface are burned by wildfires each year.

2ND AUGUST

1. Women led enterprises could create around 170 million jobs, **(NITI Aayog)**

2. ICRA estimates that domestic air passenger traffic will grow by **8–13% in FY2024.**

5TH AUGUST

1. Fishing and aquaculture sector contributes **1.5% of India's GDP**.

2. Trends (2014 - 2024): Length of National Highways (NH) has increased 1.6 times from 0.91 lakh km to 1.46 lakh km. Total capital investment in NH has risen from Rs. 50,000 crores to Rs. 3.1 lakh crore.

7TH AUGUST

1. There are around **8 to 9 million Indians in West Asia with countries like UAE, Saudi Arabia, Kuwait, Oman**, etc., among top sources of inward remittances.

2. Between 1901 and 2018, average worldwide sea level rose by 15 to 25 cm, reached record high in 2022 and is predicted to further rise by 15 mm per year by 2100.

8TH AUGUST

1. As per Ministry of New and Renewable Energy, **India's installed renewable energy capacity increased from 76.38 Gigawatts (GW) in 2014 to 203.1 GW in 2024.**

2. **Google enjoys an 89.2% market share for Google search services (GSS)**, which increases to 94.9% on mobile devices.

13TH AUGUST

1. About **50% India's external trade and 80% energy imports transit through Sea lane of communication (SLOC) in the Arabian Sea.**

2. The amount of ethanol blended with petrol has surged to over 500 crore liters in 2022-23, with a current blending rate exceeding 15%.

14TH AUGUST

1. **NEET (Not in Employment, Education or Training) Status:** 20.4% of youth were in NEET in 2023, indicating broader labour market exclusion.

2. **80% of the large dams** in India are already over 25 years old.

19TH AUGUST

1. According to the WHO, Health workers are at high risk of violence all over the world. **Between 8% and 38% of health workers suffer physical violence while others face verbal aggression.**

2. Shipping sector accounts for nearly 3% of world's CO_2 emissions. For India, **GHG emissions from maritime (excluding military operations) contribute 1% of overall transport sector GHG emissions.**

22 AUGUST

1. The Directorate General of GST Intelligence (DGGI) has detected tax evasion of Rs 1.2 trillion using fake Input Tax Credit (ITC), since 2020.

23 AUGUST

1. Overall, 151 MPs/MLAs have such charges, with one-third from the ruling party at the center. There are **16 sitting MPs and MLAs who have declared cases related to rape.**

27 AUGUST

1. Indian Biotechnology sector: Valued at $151.1 billion in 2023 and is projected to reach $300 billion by 2030. **India, with a 3% share of the global biotechnology industry, is ranked third in Asia** and is among the top 12 biotech destinations in the world.

28 AUGUST

Key-achievements under PMJDY

1. By July 2024, 52.74 crore Jan Dhan accounts were opened.

2. More than **55% accounts holders are women**.

3. **Almost 100% of villages are covered with banking outlets** within 5 km mapped as per Jan Dhan Darshak App.

4. Average Deposit in PMJDY accounts increased by 4.12 times between 2015- 2024.

5. Number of zero balance accounts decreased to **4.26 crores as against 8.52 crores in March 2015**.