



# INSIGHTSIAS

SIMPLIFYING IAS EXAM PREPARATION

## ANCIENT ROCK PAINTINGS

In Mauxi village, Goa, rock carvings dating back to the Neolithic age were confirmed by the Archaeological Survey of India (ASI).

# CURRENT AFFAIRS 30

MAY 2024

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## GENERAL STUDIES – 1

Topics: [Population and associated issues, poverty and developmental issues.](#)

### 1. MIGRATION IN INDIA: STATUS, PROSPECTS AND CHALLENGE

**Context:**

Migration is a crucial aspect of **economic diplomacy, particularly in Asia where India’s growth is expected to lead global expansion**. This growth will drive significant migration to cities, necessitating a focus on urban development.

**About Migration in India:**

Topic	Description
<b>About Migration</b>	The International Organization for Migration defines a <b>migrant as any person who is moving or has moved across an international border</b> or within a state away from his/her habitual place of residence.
<b>Factors Determining Migration</b>	Migration can be either voluntary or forced movements as a consequence of the increased magnitude or frequency of disasters, economic challenges, extreme poverty, or conflict situations.
<b>Push Factors</b>	Push factors <b>compel a person to leave their place of origin (out-migration)</b> and migrate to another place. These factors can include economic reasons, social reasons, Pandemics and lack of development in a particular place.
<b>Pull Factors</b>	Pull factors <b>attract migrants (in-migration) to a destination area</b> . These factors can include job opportunities, better living conditions, and the availability of basic or high-level facilities.
<b>Migration – 2011 Census</b>	Number of internal migrants (both inter-state and within state) in India: <b>over 45 crores (37% of the country’s population)</b>
<b>Migration – Economic Survey 2016-17</b>	<b>Relatively less developed states (e.g., Bihar and Uttar Pradesh):</b> High net out-migration
	<b>Relatively more developed states (e.g., Goa, Delhi, Maharashtra, Gujarat, Tamil Nadu, Kerala, Karnataka):</b> Reflect net immigration
	<b>Largest recipient region:</b> Delhi (accounted for more than half of migration in 2015-16); Uttar Pradesh and Bihar combined: Account for half of the total out-migrants
<b>Migration in India Report 2020-21</b>	Female migration is more than male migration. Reasons for female migration: <b>Marriage</b> <b>Reasons for male migration:</b> Search for employment
<b>Migration and its Impacts on Cities</b>	According to a report by the World Economic Forum, <b>smaller cities are rapidly growing but struggling to cope with infrastructure</b> demands due to declining civic revenue resources.
2024 <a href="#">World Migration Report</a>	India hosts the <b>largest population of international migrants worldwide, totalling 18 million</b> , predominantly in countries like the UAE, USA, and Saudi Arabia.
	Furthermore, in 2022, <b>India emerged as the foremost recipient of remittances</b> , surpassing the significant milestone of receiving over USD 111 billion, indicative of its substantial role in the global migrant workforce and economy.

<b>Push-factors</b> Countries of origin	<b>Migrants</b>	<b>Pull-factors</b> Countries of destination
<ul style="list-style-type: none"> <li>⇒ Population growth, young age structure</li> <li>⇒ Inadequate educational institutions, medicare and social security</li> </ul>	<b>Demographic factors and social infrastructure</b>	<ul style="list-style-type: none"> <li>⇒ Stable population, population decline, demographic ageing</li> <li>⇒ Welfare state benefits, educational institutions, medicare, social security</li> </ul>
<ul style="list-style-type: none"> <li>⇒ Unemployment, low wages</li> <li>⇒ Poverty, low consumption and living standard</li> </ul>	<b>Economic factors</b>	<ul style="list-style-type: none"> <li>⇒ Labour demand, high wages</li> <li>⇒ Welfare, high consumption and living standard</li> </ul>
<ul style="list-style-type: none"> <li>⇒ Dictatorships, shadow democracy, bad governance, political upheaval</li> <li>⇒ Conflict, (civil) war, terrorism, human rights violation, oppression of minorities</li> </ul>	<b>Political factors</b>	<ul style="list-style-type: none"> <li>⇒ Democracy, rule of law, pluralism, political stability</li> <li>⇒ Peace, security, protection of human and civil rights, protection of minorities</li> </ul>
<ul style="list-style-type: none"> <li>⇒ Ecologic disaster, desertification, lack of natural resources, water shortage, soil erosion, lack of environmental policy</li> </ul>	<b>Ecological factors</b>	<ul style="list-style-type: none"> <li>⇒ Better environment, environmental policy, protection of natural resources and environmental protection</li> </ul>
<ul style="list-style-type: none"> <li>⇒ Decisions of the family or the clan</li> <li>⇒ Information flows, media,</li> </ul>	<b>Migrant flows and migrant stocks</b>	<ul style="list-style-type: none"> <li>⇒ Diaspora, ethnic community</li> <li>⇒ Information flows, media, transferred picture of</li> </ul>

**Circular Migration in India:**

In India, **internal migration** has often been circular, particularly from rural to urban areas, driven by **industrialization and job opportunities** in the manufacturing, construction, and services sectors. Inter-state migration is prevalent, with states like **West Bengal, Odisha, and Bihar** experiencing high out-migration rates. Circular migrants benefit from better-paying jobs, remittances, and improved household welfare. However, they may face challenges, such as exploitation, language barriers, and seasonal job insecurity.

**Reasons for Migration to Smaller Cities in the IT/ITeS Sector:**

Reasons	Example
<b>Remote and hybrid work models</b>	Companies like Cognizant allowed employees to work from anywhere (during the pandemic), leading to a shift away from major cities.
	Companies can establish satellite offices in smaller cities, supporting remote and hybrid work models.
<b>Cost savings</b>	Moving to smaller cities allows companies to reduce real estate costs and invest more in people and R&D.
	Employees can save more in terms of rental costs and experience social benefits in smaller towns.
<b>Rich talent pool</b>	Smaller cities have untapped talent with a potential talent drain to larger metros, providing opportunities.
<b>Higher retention rates</b>	Employees prefer to stay in their hometowns, leading to higher retention rates in smaller cities.

<b>Availability of office space and amenities</b>	Smaller cities like Coimbatore offer quality office spaces with amenities at lower costs compared to metros.
<b>Rise of co-working spaces in smaller cities</b>	Co-working spaces provide access to high-quality office space at a fraction of the cost in larger cities.
<b>Counter-magnet dynamics</b>	Surat and Pune have started acting as a counter-magnet region to Mumbai and attract migrants from the neighbouring districts of Maharashtra

### Impact of Migration:

#### Positive:

1. **Economic Growth:** Fills labour gaps, boosts productivity, and generates remittances.
2. **Social Impact:** Spreads ideas, enriches culture, and improves quality of life.
3. **Innovation:** Introduces new skills and technologies, fostering entrepreneurship.
4. **Labour Market Flexibility:** Balances supply and demand, especially in skilled sectors.

#### Negative:

1. **Demographic Impact:** Contributes to urban growth, affecting rural areas and agriculture.
2. **Environmental Impact:** Strains infrastructure, leading to unplanned urban growth and pollution.
3. **Social Tensions:** Creates competition for resources, housing, and services, fostering cultural clashes and family disruption.

### Challenges of Migration in India:

1. **Inadequate Social Security:** Lack of access to healthcare and safety standards exposes migrants to unsafe conditions.
2. **Limited Benefit Portability:** Difficulty accessing state-provided benefits like food supplies through PDS due to residency requirements.
3. **Housing and Amenities:** Migrants struggle to find affordable housing and basic facilities in urban areas.
4. **Exploitation:** Migrants face exploitation, wage theft, and discrimination in the labour market.
5. **Discrimination:** Instances of violence and discrimination against migrants, notably in Maharashtra in 2008.

### Government Initiatives on Migration:

1. **Draft National Migrant Labour Policy:** Prepared by NITI Aayog, emphasizes collective action for better migrant conditions.
2. **One Nation One Ration Card (ONORC):** Expanded project for migrant welfare.
3. **Affordable Rental Housing Complexes (ARHC)** and **PM Garib Kalyan Yojna:** Introduced to provide housing solutions.
4. **e-Shram Portal:** Launched to enhance migrant status and facilitate better access to benefits.
5. **Code on Social Security:** Provides insurance and provident fund benefits for inter-state migrant workers.

### International Migration and Global Action:

6. **United Nations General Assembly:** Convened high-level meetings to address refugee and migrant movements.
7. **New York Declaration for Refugees and Migrants:** Commitment to protect the safety, dignity, and human rights of migrants.
8. **Global Compact for Safe, Orderly, and Regular Migration:** Adopted to ensure safe and regulated migration.
9. **International Migrants Day:** Celebrated annually on December 8th.

### The way forward and Conclusion:

To tackle the challenges of migration, comprehensive measures need to be implemented. **Firstly, there should be a focus on providing basic amenities and social security measures** to migrants, regardless of their migration status. **Integration and inclusion of migrants into society** are crucial to fostering social cohesion and minimizing discrimination. **Investing in rural skill development** and job creation can reduce the necessity for migration by enhancing employability. **Governments should also develop counter-magnet cities** by investing in infrastructure and amenities to promote balanced regional development and alleviate pressure on major urban hubs. **National surveys must gather more information** on the socio-economic conditions of migrants post-migration, as current data is lacking.

Furthermore, **labour market policies must safeguard the rights of migrant workers**, ensuring fair wages, safe working conditions, and access to social security benefits through strict enforcement of labour laws.

Additionally, **there is a dearth of time-use data for migrants, particularly unemployed female migrants**, which could greatly enhance our understanding of their circumstances. To address this, there needs to be a shift towards collecting more female-specific data, shedding light on their challenges and prompting informed policy decisions.

#### Insta Links: Human Migration

#### Mains Links:

1. What are the main socio-economic implications arising out of the development of IT industries in major cities of India? (UPSC 2021)

2. Discuss the changes in the trends of labour migration within and outside India in the last four decades. (UPSC 2015)

## GENERAL STUDIES – 2

Topics: Indian Constitution- historical underpinnings, evolution, features, amendments, significant provisions and basic structure; Comparison of the Indian constitutional scheme with that of other countries.

### 1. BALANCING FUNDAMENTAL RIGHTS AND DIRECTIVE PRINCIPLES

#### Context:

In the case of **Property Owners Association vs State of Maharashtra**, the Supreme Court has an opportunity to settle a constitutional clash between fundamental rights and Directive Principles of State Policy.

#### What is the case about?

The case of Property Owners Association vs State of Maharashtra involves a **constitutional clash between fundamental rights and Directive Principles of State Policy**. It centres on **interpreting Article 39(b) of the Constitution**.

#### It raises two key questions:

1. The interpretation of the term **“material resources of the community”** in **Article 39(b)** of the Constitution.
2. **Whether laws enacted to fulfil the objectives of Article 39(b) are** exempt from legal challenges based on fundamental rights to equality and liberty, highlighting a conflict between **fundamental rights (Part III) and Directive Principles of State Policy (Part IV) of the Constitution**.

#### Conflict between FR and DPSP:

1. **Foundational Conflict:** While Part III guarantees enforceable fundamental rights, Part IV outlines non-justiciable DPSPs. The tension arises from the divergent nature of these provisions, with rights being justiciable and DPSPs being non-justiciable.
2. **Clash of Priorities:** Fundamental rights prioritize individual autonomy, while DPSPs focus on social and economic justice.
3. **Constitutional Foundation:** Articles 13 and 37 establish the framework, protecting fundamental rights and making DPSPs non-justiciable.
4. **Early Judicial Clarification:** The Supreme Court emphasizes implementing DPSPs without infringing fundamental rights in Mohd. Hanif Quareshi case.
5. **Article 31(C) Introduction:** The 25th Amendment in-

troduces Article 31C to shield laws for the common good from fundamental rights scrutiny.

6. **Kesavananda Bharati Case (1973):** Validates Article 31C subject to judicial review.
7. **42nd Constitutional Amendment:** Expands Article 31C’s scope; declared unconstitutional in Minerva Mills case.
8. **Waman Rao Case:** Upholds Article 31C’s validity by aligning with **Articles 39(b) and (c)**.
9. **R. Coelho v. State of T.N (2007):** SC said that it is the responsibility of the government to adopt a middle path between individual liberty (Fundamental Rights) and public good (Directive Principles).

#### FR Vs DPSP

Aspect	Fundamental Rights	Directive Principles of State Policy
Origin	Borrowed from the constitution of the USA	Borrowed from the constitution of Ireland
Coverage	Part III, Articles 12 – 35	Part IV, Articles 36 – 51
Enforceability	Justiciable - legally enforceable by courts	Non-justiciable - not legally enforceable by courts
Connotation	Negative - Prohibit state actions	Positive - Enable state actions
Aim	Establish political democracy	Establish social and economic democracy
Driving Force	Legal sanctions	Moral and political sanctions
Focus	The welfare of individual, personal and individualistic	The welfare of the community, sectarian and socialistic
Enforcement	Automatically enforced, legislation is not always required (exception - Art. 17)	Legislation required for enforcement
Consequences of Violation	Violation may invalidate the law	The violation does not invalidate the law, judiciary may uphold law enacted to fulfill directive

#### Similarities Between Fundamental Rights and DPSP:

1. Both are borrowed features of the constitution.
2. Both aim to achieve inclusive and equitable growth of the nation.
3. Both are backed by broader constitutional provi-

sions.

- Both are critical for strengthening India's democratic setup.
- Both serve as guiding principles for the judiciary in determining constitutionality.
- The genesis and objectives of both parts have a common aim in responding to societal needs as envisioned by the constitution makers.

The **Directive Principles of State Policy** and the **Fundamental Rights** together form the backbone of the Indian Constitution. These two sets of principles embody the **core values and philosophy** upon which the Constitution is built. **Granville Austin**, a renowned constitutional expert, has aptly described them as the **'Conscience of the Constitution.'**

**Directive principles and fundamental rights are intricately linked in the Indian Constitution.** While fundamental rights protect civil and political liberties, directive principles address social and economic rights. **Despite being non-justiciable**, directive principles hold significant importance. Over the years, the Supreme Court has emphasized **their complementary nature**. The court has stressed the integrated scheme of fundamental rights and directive principles, advocating for a **harmonious interpretation to achieve broader socio-economic goals**. It has also highlighted the responsibility of the government to strike a middle path between individual liberty and public good, ensuring a balanced approach to governance.

### **Conclusion:**

The Property Owners case presents an opportunity to **reaffirm the core principles of equality, liberty, and social justice** in the Indian Constitution. By balancing individual rights with collective welfare, the judiciary can strengthen India's constitutional democracy, ensuring justice and equity in governance.

### **Insta Links:**

- [Fali S Nariman on Basic Structure Doctrine](#)

### **Mains Link:**

Q1. 'Constitutional Morality' is rooted in the Constitution itself and is founded on its essential facets. Explain the doctrine of 'Constitutional Morality' with the help of relevant judicial decisions. (USPC 2021)

Q2. "Parliament's power to amend the Constitution is limited power and it cannot be enlarged into absolute power." In light of this statement explain whether Parliament under Article 368 of the Constitution can destroy the Basic Structure of the Constitution by expanding its amending power. (UPSC 2019)

### **Prelims Link:**

**Q1. Which part of the Constitution of India declares the ideal of a Welfare State? (UPSC 2020)**

- Directive Principles of State Policy
- Fundamental Rights
- Preamble
- Seventh Schedule

**Ans: (a)**

**Q2. Other than the Fundamental Rights, which of the following parts of the Constitution of India reflect/reflect the principles and provisions of the Universal Declaration of Human Rights (1948)? (UPSC 2020)**

- Preamble
- Directive Principles of State Policy
- Fundamental Duties

Select the correct answer using the code given below:

- 1 and 2 only
- 2 only
- 1 and 3 only
- 1, 2 and 3

**Ans: (d)**

**Q3. With reference to the provisions contained in Part IV of the Constitution of India, which of the following statements is/are correct? (UPSC 2020)**

- They shall be enforceable by courts.
- They shall not be enforceable by any court.

3. The principles laid down in this part are to influence the making of laws by the State. Select the correct answer using the code given below:  
 (a) 1 only  
 (b) 2 only  
 (c) 1 and 3 only  
 (d) 2 and 3 only  
**Ans: (d)**

## 2. INDIA SET TO TRANSITION TO LIVING WAGES APPROACH

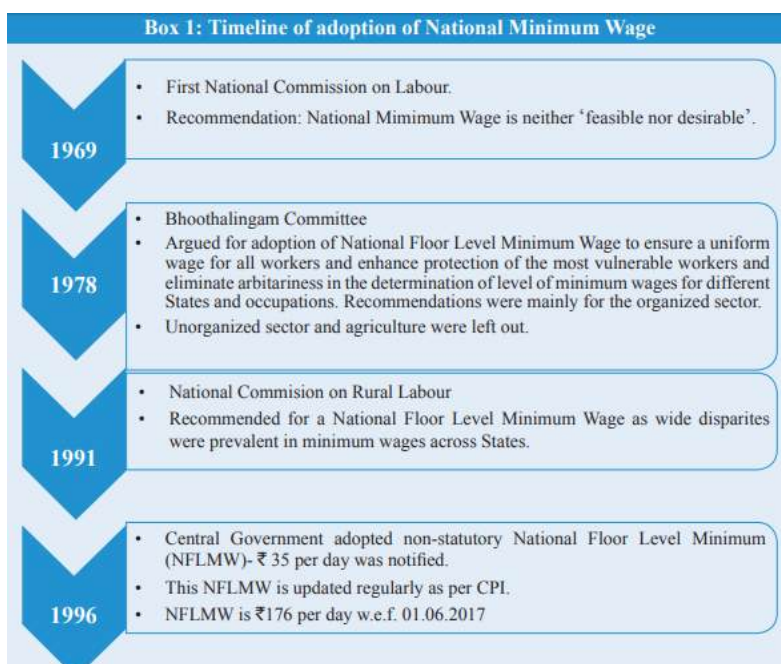
**Context:**

India’s decision to **transition from minimum wage to a scientifically determined living wage by 2025**, with support from the International Labour Organisation (ILO), is commendable.

**Types of Wages:**

Type of Wage	Definition
<b>Minimum Wage</b>	The <b>minimum amount of remuneration that an employer is required to pay wage earners</b> for the work performed during a given period, <b>cannot be reduced</b> by collective agreement or an individual contract. It includes <b>basic needs like food, shelter, and clothing</b> .  In India, the minimum wage calculation varies depending on the state government and <b>worker’s skill level and the nature of their</b> work among other factors.
<b>Living Wage</b>	The wage needed to provide the minimum income necessary to pay for basic needs is based on the cost of living in a specific community. In addition to basic needs, <b>a living wage includes education, health, insurance</b> , and other essential expenses.  <b>Article 43 of the Indian Constitution</b> mandates the State to ensure, through appropriate legislation or economic measures, <b>a living wage for all workers</b> , including those in agriculture, industry, and other sectors.  <b>In the Raptakos case (1991)</b> , the Supreme Court advocated the <b>concept and the right to living wage</b> .
<b>Fair Wage</b>	A fair wage is a balance between a living wage and a minimum wage. It aims to <b>provide workers with reasonable compensation</b> that meets both their basic needs and ensures a decent standard of living.
<b>Starvation Wage</b>	Starvation wage refers to wages that are <b>insufficient to provide the ordinary necessities of life</b> . Workers earning starvation wages struggle to afford even basic essentials such as food, shelter, and healthcare.

**Evolution of Wage System in India:**



**Current wage system in India:**

In India, the current wage system operates under the **National Floor Level Minimum Wage (NFLMW)**, established by the government as per the **Code on Wages 2019**. This mandates that employers cannot set wages below this minimum level. While the NFLMW is set at **Rs 178 per day**, states have the flexibility to revise minimum wage rates accordingly, as outlined in Section 5 of the Code on Wages 2019.

**Issues with the Current Wage System:**

The current **National Floor Level Minimum Wage (NFLMW)** of ₹176 per day, set in 2017, **lags far behind other countries in the Asia-Pacific region**, such as China, Vietnam, and Bangladesh. By adopting a living wage approach, **India can address the disparity and ensure fair compensation for workers**, as demonstrated by examples from countries like Brazil and developed economies such as Australia, the UK, and the US.

**Need for Living Wage Standard:**

Need	Description
Insufficiency to Meet Basic Needs	The current minimum wage is inadequate for basic needs due to inflation.
	45% of salaried workers <b>earn less than Rs 9750 monthly</b> , pushing many below the poverty line.
Alleviating Poverty	Transition to living wages aims to uplift millions out of poverty.
Wage Discrepancies	Over 500 million workers, 90% in the unorganized sector, earn varying minimum wages, some below the poverty line.
	About 80% of unorganized sector workers earn below government-stipulated minimum wages.
Achieving SDGs	India is committed to SDGs including decent work and economic growth; living wages can expedite poverty reduction efforts.
Reducing Inequalities	India’s high inequality requires wage structure redesign.
	Strong economic growth indicates the capacity for higher wages.
Positive Work Culture	Higher wages can boost morale, and productivity, reduce turnover, and enhance customer satisfaction.
	Investing in employee well-being fosters loyalty and work ethic.

**Legislations on Minimum Wages:**

**Legislations on Minimum Wage in India** have evolved over time. Until 2019, the **Minimum Wages Act of 1948 governed minimum wage fixation**. This Act allowed the Central government to set wages for certain industries, while State governments had jurisdiction over others, including the private sector. The introduction of the **Code of Wages in 2019** aimed to standardize wage regulations and ensure that **minimum wages do not fall below the National Wage Floor (NFW)**. However, full implementation of this code, which is applicable nationwide, is still pending.

**Case Studies:**

- United Kingdom:** Adoption of living wage standards has led to improved employee satisfaction and productivity.
- United States:** Initiatives like Seattle’s \$15 per hour minimum wage have enhanced working conditions for low-wage workers.

**What Needs to be done:**

- Minimum Wages for Gig Workers: Currently**, only three platforms, including Bigbasket, Flipkart, and Urban Company, have minimum wage policies to ensure workers earn at least the local minimum wage.
- Government Legislation and Policies:** Governments should enact laws beyond minimum wage standards, considering comprehensive policies that reflect the true cost of living.
- National Multidimensional Poverty Index:** Incorporating health, education, and standard of living indicators into the definition of living wages can align with India’s multidimensional poverty index.
- Inflation Adjusted Wage:** To address market volatility, minimum wages should be adjusted for inflation, ensuring alignment with economic fluctuations.
- Overcoming Implementation Challenges:** Governments can support small businesses facing increased labour costs through incentives like tax credits or grants.
- Collective Bargaining:** Empowering workers through collective bargaining ensures their interests are represented in

wage negotiations.

7. **Adaptation and Innovation:** Collaboration between policymakers, businesses, and labour advocates is crucial to mitigate the impact of automation and the gig economy on worker rights and fair compensation.
8. **Integration with Sustainable Development Goals:** Aligning living wages with sustainable development goals strengthens the global commitment to fair compensation and socioeconomic progress.

**Code of Wages Act 2019:**

**India's Minimum Wage Policy under the Code of Wages Act 2019** aims to modernize outdated labour laws, ensuring transparent and accountable regulations. It universalizes minimum wage provisions for all sectors, guaranteeing timely payment and the **"Right to Sustenance" for workers**. The Central Government determines floor wages considering living standards, allowing for regional variations. State-set minimum wages must exceed the floor wage. The Code introduces the concept of floor wage, preventing states from setting wages below this baseline. However, concerns arise regarding potential capital flight due to regional wage disparities.

**Insta Links**

[Insights into Editorial: The minimum wage solution](#)

**Mains Links**

Q. Examine the role of 'Gig Economy' in the process of empowerment of women in India. (UPSC 2021)

**Prelims Links:**

Q. In India, which one of the following compiles information on industrial disputes, closures, retrenchments and lay-offs in factories employing workers? (UPSC 2022)

- (a) Central Statistics Office
- (b) Department for Promotion of Industry and Internal Trade
- (c) Labour Bureau
- (d) National Technical Manpower Information System

**Ans: C**

[Topics: Parliament and State Legislatures – structure, functioning, conduct of business, powers & privileges and issues arising out of these.](#)

### 3. PRS LEGISLATIVE RESEARCH'S ANNUAL REVIEW OF STATE LAWS 2023

**Context:**

[PRS Legislative Research](#) (an **Indian non-profit organisation** established in September 2005 as an independent research institute) has released its **"Annual Review of State Laws 2023,"** providing a detailed analysis of State legislatures' performance across India.

**Status of Bills Passed by States:**

On average, states passed **18 bills each in 2023**. Maharashtra passed 49 bills, while Delhi and Puducherry passed only 2 each.

**Issues with the Working of the State Legislatures:**

Issues	Examples
<b>Budget Passage Without Discussion</b>	In 2023, around 40% of the <b>over Rs 18 lakh crore budget</b> across 10 states was passed without discussion. <b>Madhya Pradesh passed 85% of its over Rs 3 lakh crore budget</b> without discussion. Kerala, Jharkhand, and West Bengal followed with 78%, 75%, and 74% respectively
<b>Poor functioning of the Public Accounts Committee (PAC)</b>	In 2023, <b>PAC held 24 sittings on average and tabled 16 reports</b> . In five states, including <b>Bihar and Delhi, PAC didn't table any reports</b> . <b>Maharashtra's PAC</b> neither convened nor released any report throughout the year
<b>Hurried Legislative Action</b>	<b>44% of bills in all the states in 2023</b> , were passed on the same or the next day of introduction. <b>Gujarat, Jharkhand, Mizoram, Puducherry, and Punjab</b> passed all bills on the same day. - Kerala and Meghalaya took longer than five days to pass over 90% of their bills.
<b>Ordinances Route</b>	<b>Uttar Pradesh issued 20 ordinances</b> , followed by Andhra Pradesh (11) and Maharashtra (9)
<b>Poor Evaluation of Law-Making</b>	<b>Only 23 out of over 500 bills</b> were referred to legislative committees for deeper examination.
<b>Assent by Governor</b>	While the Constitution requires the Governor to give assent to Bills at the earliest, only <b>59% of the Bills received assent within a month</b> of being passed. Delays were seen in states like Assam, Nagaland and West Bengal.

**Committee recommendations for improving State Assembly functioning:**

1. **Sarkaria Commission on Centre-State Relations (1988):**
  - a. **Emphasized timely decisions on bills by** establishing a legislative framework with time limits for the Governor's assent.
  - b. Recommended that **State Finance Commission** recommendations be considered

in legislative budget discussions to ensure thorough debates.

2. **National Commission to Review the Working of the Constitution:**
  - a. Recommended subjecting parliamentarians/assembly members to public scrutiny through a parliamentary ombudsman.
  - b. Suggested **minimum annual meeting requirements for State Legislatures** based on the number of members.

**Way forward:**

1. **Strengthening PAC:** Standardize PAC operations with clear guidelines on sitting frequency, reporting requirements, and timelines.
2. **Expedited Decision-Making:** Mandate the Governor to provide transparent and specific reasons for any delay in granting assent.
3. **Legislative Review:** Advocate for thorough discussions and debates on budgets before passage, with consideration of State Finance Commission recommendations.
4. **Strengthen the role of State Finance Commissions** in legislative budget discussions.
5. **Establish minimum session days for the assemblies** to enhance legislative functioning.

**Conclusion:**

These recommendations aim to standardize PAC operations, expedite decision-making processes, promote transparency in legislative functioning, and ensure substantive discussions on important matters before their passage in the State Assemblies.

**About the State Legislative Assembly (also known as Vidhan Sabha)**

It is the primary legislative body in Indian states and certain union territories. It comprises directly elected Members of the **Legislative Assembly (MLAs) serving 5-year terms**. In 22 states and 3 union territories, **it's unicameral**, while in 6 states, it's the lower house of a bicameral legislature. Each assembly must have **60 to 500 members**, with exceptions granted by Parliament. The assembly can be dissolved in emergencies, by the Governor on the Chief Minister's request, or by a motion of no confidence against the ruling majority.

**Mains Link:**

Q. Discuss the essential conditions for the exercise of the legislative powers by the Governor. Discuss the legality of the re-promulgation of ordinances by the Governor without placing them before the Legislature. (UPSC 2022)

Q. Effectiveness of the government system at various levels and people's participation in the governance system are interdependent". Discuss their relationship in the context of

India. (UPSC 2016)

Q. Public expenditure management is a challenge to the Government of India in the context of budget-making during the post-liberalization period. Clarify it. (UPSC 2019)

**Prelims Link:**

**Q. Which of the following are the discretionary powers given to the Governor of a State? (UPSC 2014)**

1. Sending a report to the President of India for imposing the President's rule
2. Appointing the Ministers
3. Reserving certain bills passed by the State Legislature for consideration by the President of India
4. Making the rules to conduct the business of the State Government

Select the correct answer using the code given below:

- (a) 1 and 2 only
- (b) 1 and 3 only
- (c) 2, 3 and 4 only
- (d) 1, 2, 3 and 4

**Ans: B**

Topics: Structure, organization and functioning of the Executive and the Judiciary; Ministries and Departments of the Government; pressure groups and formal/informal associations and their role in the Polity.

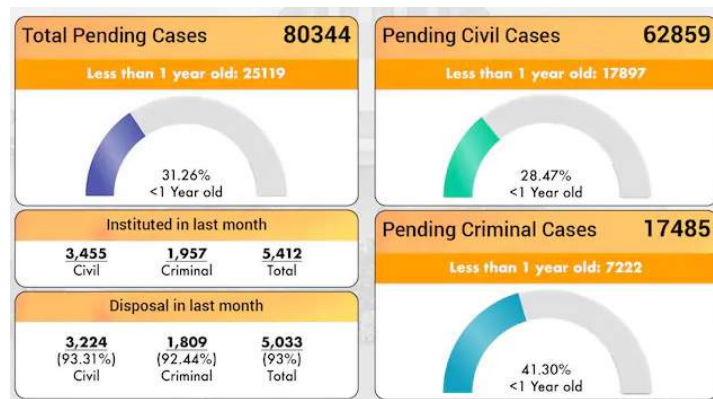
## 4. JUDICIAL PENDENCY IN INDIA

**Context:**

**Blaming court vacations for pending cases** overlooks deeper issues plaguing India's judiciary, including unfilled vacancies and lack of infrastructure. The problem extends beyond judges' schedules and requires comprehensive solutions.

**Status:**

As of September 2023, the Supreme Court of India has **80,344 pending cases, with 78% being civil matters and 22% criminal**. In 2023, the court disposed of 36,164 out of 37,777 cases filed. Over 4,000 pending cases are more than a decade old.



**Causes for huge pendency of cases:**

Causes for huge pendency of cases	Details
Shifting role of SC	Shifting the role of the Supreme Court from adjudicating cases of constitutional significance into a regular court of appeals or cases of violation of fundamental rights.
Shortage of judges	Around 25% of posts are lying empty in the subordinate courts, which leads to a poor Judges to Population Ratio. Earlier, the Law Commission had recommended <b>50 judges per million population</b> .
Low budgetary allocation leads to poor infrastructure	The infrastructure status of lower courts is dismal due to which they fail to deliver quality judgements.
The burden of government cases	Centre and the States were responsible for over 46% of the pending cases in Indian courts.
Special leave petition	Frivolous PILs and government policies which are challenged by the people take up most of the judiciary's time.
Lack of court management systems	Only a few courts have court managers who help improve court operations and optimize case movement and judicial time.

**Consequences of pendency:**

- Denial of 'timely justice' amounts to a denial of 'justice' itself:** Timely disposal of cases is essential to maintain the rule of law and provide access to justice.
- A weak judiciary has a negative effect on social development, which leads to:**
  - lower per capita income;
  - higher poverty rates;
  - poorer public infrastructure; and
  - higher crime rates.
- Affects human rights:** Overcrowding of the prisons results in "violation of human rights".

**Way forward:**

- Split the Supreme Court into Two Divisions:** The 10<sup>th</sup> Law Commission proposed to divide the Supreme Court into a Constitutional Division and a Legal Division, focusing on specific areas of law to streamline cases.
- Establish a National Court of Appeal for SLPs:** SC had previously suggested the creation of a specialized court to handle special leave petitions, allowing the Supreme Court to focus on constitutional and public law issues.
- Establish Regional Benches of Supreme Court:** Recommendation (229th Law Commission Report, 2009) to set up regional benches in Delhi, Chennai/Hyderabad, Kolkata, and Mumbai to hear non-constitutional cases and reduce the backlog.
- Increase the number of Work Days:** Proposals to extend the working days of the Supreme Court and reduce vacation periods to address the backlog of cases.
  - The 2009 Law Commission, in its 230th report,** suggested that court vacations be cut down by 10-15 days at all levels of the judiciary to help cut the backlog of cases.

- Establish a Final Court of Appeal and a Permanent Constitution Bench:** Suggestions to separate the Supreme Court's functions into a Final Court of Appeal and a dedicated Constitution Bench for better efficiency and consistency.
- Establish a Dedicated Authority for Infrastructure:** Proposal (by Former CJI NV Ramanna) to create a National Judicial Infrastructure Authority of India (NJIAI) to improve judicial infrastructure across the country.
- Alternate dispute resolution (ADR):**
  - Lok Adalat should be **organized regularly for settling civil and family matters**.
  - Gram Nyayalayas** will help in decreasing the workload of the judicial institution.
  - Village Legal Care & Support Centre** can also be established by the High Courts to work at the grassroots level.

**Conclusion**

The fundamental requirement of a good judicial administration is accessibility, affordability and speedy justice, which will not be realized until the justice delivery system is made within the reach of the individual in a time-bound manner and within a reasonable cost.

**Insta Links**

- [Judicial Pendency](#)

**Mains Links:**

**Q. Critically examine the Supreme Court's judgement on the 'National Judicial Appointments Commission Act, 2014' with reference to the appointment of judges of higher judiciary in India. (USPC 2017)**

**Prelims Links:**

**Q. With reference to the Indian judiciary, consider the following statements: (USPC 2021)**

1. Any retired judge of the Supreme Court of India can be called back to sit and act as a Supreme Court judge by the Chief Justice of India with the prior permission of the President of India.
2. A High Court in India has the power to review its own judgement as the Supreme Court does.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Ans: (c)

Topics: [Government policies and interventions for development in various sectors and issues arising out of their design and implementation.](#)

## 5. GOOD NEWS FOR INDIA'S HEALTHCARE SYSTEM

### Context:

India's healthcare system is witnessing positive developments, with significant increases in government health expenditure (GHE) as a proportion of GDP and per capita expenditure.

### Findings of the recent National Health Accounts (NHA):

1. **Increasing Government Investment in Healthcare:** Government health expenditure (GHE) as a percentage of GDP rose from **1.13% to 1.84%** between 2014-15 and 2021-22.
2. **Per capita government spending** on health **almost tripled** during the same period.
  - a. **The National Health Policy (NHP)** aims to increase public health expenditure to **2.5% of GDP by 2025.**
3. **Government-Funded Insurance Schemes:** Investment in government health insurance schemes like [Ayushman Bharat PMJAY](#) increased significantly (**4.4-fold rise since 2013-14**).
4. **Decreasing Out-of-Pocket Expenditure (OOPE):** OOPE decreased from over **62%** to about **39%** between 2014-15 and 2021-22.
5. **Factors Contributing to Lower OOPE:** Increased utilization of government facilities, free ambulance services, and other initiatives contribute to reduced OOPE. The availability of free medicines and diagnostics at [Ayushman Arogya Kendras \(AAMs\)](#) further lowers healthcare costs.
6. **Focus on Essential Drugs and Price Regulation:** Jan Aushadhi Kendras provide affordable generic medicines and surgical items, resulting in substantial savings since 2014.
7. **Strengthening Social Determinants of Health:** Increased government spending includes **investments**

**in water supply and sanitation** through various missions.

8. **Investing in Healthcare Infrastructure:** Schemes like Pradhan Mantri Swasthya Suraksha Yojana [and Ayushman Bharat Infrastructure Mission](#) are **bolstering medical infrastructure.**

### Challenges in the healthcare sector in India:

Challenges	Description
<b>Inequitable Access to Health Insurance</b>	Lowest health insurance coverage among households under the underprivileged sections.
	NFHS-5 results show only about 36% coverage among lowest lowest-wealth households.
<b>Poor Finance</b>	India's current health expenditure (both Government + Private) stands at approximately <b>3.2% of its GDP</b> , significantly lower than the average of over 5% observed among Lower- and Middle-Income Countries (LMIC).
<b>Inclusion and Exclusion Errors</b>	Government Schemes are prone to inclusion and exclusion errors, potentially including ineligible households and excluding eligible ones.
<b>Inadequate Availability of Services</b>	56% of PMJAY empanelled hospitals in the public sector, and 40% in the private for-profit sector, indicating unequal service availability
<b>Inadequate Infrastructure</b>	Lack of proper infrastructure, including health facilities, equipment, and medical supplies, hinders UHC
	The shortfall of over <b>79% specialists at Community Health Centers</b> compared to the requirement.
	<b>Lower bed density:</b> (number of hospital beds per 1000 population) in India is 1.0 while in low-income countries it is 1.2, in middle-income countries it is 2.4 while in the world it is 2.7.
	72 per cent of hospital beds in India are available in urban areas, while 28 per cent are in rural areas.
<b>Poor Health Education</b>	Lack of education and awareness about healthy lifestyles and preventive measures contributes to preventable illnesses and conditions.

### Way forward:

1. **Investing in Rural Healthcare Infrastructure:** Build affordable hospitals, and clinics, and provide incentives for healthcare professionals.
2. **Monitoring and Regulation:** Ensure efficient fund utili-

zation and prevent leakages through robust monitoring systems and stricter regulations.

3. **Preventative Healthcare:** Promote healthy lifestyles, early disease detection, and regular checkups to reduce future healthcare costs.
4. **Infrastructure and Human Resource Improvement:** Invest in new healthcare facilities, and medical research, and expand medical education.
5. **Accessibility of Quality Healthcare:** Implement targeted programs for marginalized communities, enforce regulations, and ensure transparency.
6. **Improving Mental Health Services:** Increase funding, train healthcare workers, and reduce social stigma around mental illness.
7. **Addressing Health Inequities:** Collaborate with other sectors to address social determinants of health and reduce health inequities.
8. **Sustainable Health Governance:** Strengthen management systems, regulatory bodies, and cybersecurity measures for critical medical infrastructure.
9. **Tax Reductions:** Incentivize R&D with tax deductions and reduce GST on life-saving drugs.
10. **One Health Approach:** Recognize the interconnectedness of human, animal, and environmental health, promoting collective health initiatives.

#### About National Health Account (NHA) estimates:

Its estimates, prepared by the **National Health Systems Resource Centre (NHSRC)**, serve as a vital tool for health financing analysis. Established in 2006-07 under the National Rural Health Mission (NRHM), NHSRC aids policy development and capacity building for the Ministry of Health and Family Welfare (MoHFW). **Using the System of Health Accounts** framework by WHO, NHA provides internationally comparable data, aiding policymakers in monitoring health financing indicators.

#### Mains Link:

**Q. "Besides being a moral imperative of a Welfare State, primary health structure is a necessary precondition for sustainable development." Analyse. (UPSC 2021)**

#### Prelims Link:

**Q. Which of the following are the objectives of 'National Nutrition Mission'? (UPSC 2017)**

1. To create awareness relating to malnutrition among pregnant women and lactating mothers.
2. To reduce the incidence of anaemia among young children, adolescent girls and women.
3. To promote the consumption of millets, coarse cereals and unpolished rice.
4. To promote the consumption of poultry eggs.

**Select the correct answer using the code given below:**

- (a) 1 and 2 only
- (b) 1, 2 and 3 only
- (c) 1, 2 and 4 only
- (d) 3 and 4 only

**Ans: A**

## 6. KEY PROVISIONS OF INDIA'S DIGITAL COMPETITION BILL, 2024

### Context:

India's proposed **Digital Competition Bill, 2024**, draws inspiration from European regulations to address concerns regarding big tech companies like Google, Facebook, and Amazon

### What is Digital Competition?

Digital competition refers to the **competitive landscape within the digital sector**, encompassing industries such as **technology, internet services, e-commerce, and digital platforms**. It involves the rivalry among companies offering digital products, services, or platforms, as well as the dynamics of market entry, innovation, pricing, and consumer choice within these sectors.

### What is Digital Competition Bill (DCB) 2024?

The Digital Competition Bill (DCB) is a proposed bill which aims to **regulate Systemically Significant Digital Enterprises (SSDE) and their Associate Digital Enterprises (ADEs)** to prevent Anti-Competitive Practices (ACPs). It draws inspiration from the Digital Markets Act (DMA) of the European Union, which was introduced to address ACPs of tech giants such as Google, Facebook, and Amazon. The **Ministry of Corporate Affairs (MCA)** is handling the draft.

### Need for the Digital Competition Bill (DCB) arises from several factors:

1. **Ineffectiveness of Current Framework:** The existing ex-post framework under the **Competition Act, 2002**, lacks the ability to promptly address anti-competitive behaviour by digital enterprises.
2. **Market dominance Concerns:** The current framework may not adequately tackle the dominance of markets in favor of large digital enterprises, leading to their permanent dominance.
3. **Arbitrary Pricing:** Big Tech's influence on pricing rules in the digital space, leads to concerns about fairness and competition.
4. **Anti-Competitive Practices:** Big tech giants have been observed engaging in practices such as data collection and self-preferencing (which can stifle competition and innovation) and Google's tweaking of its Android ecosystem to favour itself.
5. **Ensuring Orderly Expansion:** DCB aims to support the orderly expansion of the digital ecosystem by promoting fair competition and preventing monopolistic tendencies.
6. **Remove barriers for new players:** The dominance of a few companies creates barriers for new entrants, limiting innovation within the sector.

**Key provision of the DCB Bill:**

Provisions	Description
<b>Ex-Ante Regulation</b>	The bill proposes a preventive (ex ante) approach instead of the current post-incident (ex post) regulation. It aims to anticipate and prevent potential anti-competitive practices. It allows the Competition Commission of India (CCI) to <b>intervene preemptively</b>
<b>Core Digital Services (CDS)</b>	The list of core digital services (susceptible to market concentration) has been mentioned under Schedule I of the bill.
	It covers various digital services like <b>search engines, social networks, video-sharing platforms</b> , communication services, operating systems, web browsers, cloud services, advertising platforms, and online marketplaces.
<b>SSDE (Systematically Significant Digital Enterprises)</b>	The Bill proposes to <b>designate certain enterprises as SSDEs</b> . CCI designates SSDEs based on quantitative (turnover, market cap) and qualitative (user base) parameters
	SSDEs are those enterprises that provide <b>core digital services in India</b> and have a significant presence and significant financial strength in the country.
<b>Parameters to determine whether the enterprise may be designated as SSDE</b>	To determine SSDE designation, the <b>Bill proposes financial strength and spread tests</b> .
	Qualifying parameters include India turnover, global turnover, gross merchandise value, and market capitalization.
	Additionally, a <b>core digital service must have at least 1 crore end users or 10,000 business users</b> . Entities falling short may still be designated based on their significant presence in a core digital service.
<b>Obligations of SSDEs</b>	SSDEs are barred from <b>self-preferencing, anti-steering, and limiting third-party apps</b> . Violations could lead to fines of up to 10% of their global turnover.
<b>Coverage of Enterprises Outside India</b>	CCI is empowered to inquire into non-compliant enterprises.
<b>Associate Digital Enterprises (ADEs)</b>	Entities benefiting from data shared by major tech groups. They are subject to the same obligations as SSDEs.

**Issues with the Bill:**

- Compliance Burden:** Big tech firms argue that strict regulations may shift focus from innovation to compliance, citing the EU’s DMA increasing search time on Google by 4,000%.
- Broad Definitions:** Concerns exist about overbroad criteria for designating significant platforms, with India’s law leaving decisions to the CCI’s discretion.
- Impact on Smaller Businesses:** Changes and reduced data sharing could negatively affect smaller businesses reliant on tech giants’ services.
- Potential Arbitrary Decisions:** CCI discretion could lead to arbitrary rulings, affecting startups and smaller firms.

**Regulation of tech companies in other countries:**

Country	Mechanism	Description
Europe	<b>Digital Markets Act (DMA) and Digital Services Act (DSA)</b>	The Digital Markets Act (DMA) aims to <b>ban harmful business practices</b> by large digital players, creating a fairer and more competitive economic space. <b>The Digital Services Act (DSA) targets various online services</b> , including websites, internet infrastructure services, and online platforms.
USA	<b>Anti-trust legislation</b>	The United States has <b>adopted anti-trust legislation to address the dominance of Big Tech companies</b> . These measures include giving states greater power in competition cases and increasing funding for federal regulators.
Australia	<b>Competition watchdog recommendations</b>	The competition watchdog in Australia has <b>recommended tighter regulations for Facebook and Google</b> to improve media competition.
		Additionally, the <b>Online Safety Act grants</b> the power to force social media companies to delete posts constituting online bullying and imposes fines on companies and hosts involved in the alleged abuse.

## The Standing Committee on Finance submitted its report on 'Anti-Competitive Practices by Big Tech Companies' in December 2022.

### Key observations and recommendations include:

1. **Regulating Digital Markets:** Evaluate competitive behaviour in digital markets before monopolization occurs, suggesting the **identification of Systemically Important Digital Intermediaries (SIDIs)** and yearly reporting to the Competition Commission of India (CCI).
2. **Digital Competition Act:** Introduce legislation to ensure a fair digital ecosystem.
3. **Self-Preferencing:** SIDIs must not favour their own services over competitors' on their platforms.
4. **Data Usage:** SIDIs should handle user data responsibly, avoiding merging data from core services without consent and restricting data access to third-party services.
5. **Revamping CCI:** Strengthen the CCI with a specialized digital markets unit to monitor SIDIs and address anti-competitive behaviour.
6. **Third-Party Applications:** SIDIs should allow and technically enable the use of third-party applications without transferring data to foreign governments.
7. **Bundling and Tying:** SIDIs should not force users to subscribe to additional services to use their core platform.
8. **Anti-Steering:** SIDIs should not restrict business users from steering customers to offers outside the platform.

To read more about regulatin of Big Tech firms: [Click Here \(Regulating Big Tech Companies in India and the world\)](#)

### Conclusion

Collaborative efforts can help address the challenges posed by emerging technologies, promote ethical and responsible technology use, and ensure a globally inclusive and sustainable digital future.

### Insta Link:

[RBI to regulate bigtech and fintech](#)

### Mains Link:

**There is growing support for regulating big tech companies such as Facebook and Google. Discuss the reasons. (15M)**

### Prelims Link:

**With reference to 'consumers' rights/privileges under the provisions of law in India, which of the following statements is/are correct? (UPSC 2012)**

1. Consumers are empowered to take samples for food testing.
2. When a consumer files a complaint in any consumer forum, no fee is required to be paid.
3. In case of death of consumer, his/her legal heir can file a complaint in the consumer forum on his/her behalf.

**Select Wthe correct answer using the codes given below:**

- (a) 1 only  
(b) 2 and 3 only  
(c) 1 and 3 only  
(d) 1, 2 and 3

**Ans: C**

Topics: Important aspects of governance, transparency and accountability, e-governance applications, models, successes, limitations, and potential; citizens charters, transparency & accountability and institutional and other measures.

## **7. EVALUATION OF STREET VENDORS ACT, 2014**

### **Context:**

The [Street Vendors Act, implemented in 2014](#), faces challenges despite being hailed as progressive.

### **Who are Street Vendors?**

Street vendors are individuals **who sell goods or services in public spaces such as sidewalks**, streets, or markets. They often operate small businesses, selling a variety of items ranging from food and beverages to clothing, accessories, and household

goods. In India, approximately 50 lakh street vendors have been identified. Uttar Pradesh leads with over 8 lakh, followed by Madhya Pradesh with over 7 lakh.

**Significance of Street Vendors:**

Street vendors (comprising an average of **2.5% of the city population**) play a crucial role in urban India by serving diverse functions, including providing essential daily services like fresh produce and affordable food. They are integral to Indian culture, contributing iconic dishes like Mumbai’s vada pav and Chennai’s dosai.

**Constitutional Provisions Related to Street Vendors in India:**

Constitutional Provision	Description
Right to Trade	<b>Article 19 (1) (g)</b> grants Indian citizens the fundamental right to practice any profession and carry on any occupation, trade, or business.
Equality Before Law	<b>Article 14</b> ensures that the state cannot deny any person equality before the law or equal protection of the laws within India’s territory.
Social Justice	The preamble declares India as a <b>sovereign, socialist, secular democratic republic, aiming to secure justice, social, economic,</b> and political.
Directive Principles	<b>Article 38(1)</b> instructs the state to promote the welfare of the people by establishing a social order where justice is prevalent in all aspects.
	<b>Article 38(2)</b> mandates the minimization of inequalities in income, status, facilities, and opportunities.
	<b>Article 39(a)</b> requires the state to create policies ensuring both men and women have the right to adequate means of livelihood.
	<b>Article 41</b> guarantees the right to work within the state’s economic capacity.

**About Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act, 2014:**

It was enacted to address the **challenges faced by street vendors in India by regulating their activities and safeguarding their rights**. This legislation aimed to create a conducive environment for street vendors to carry out their businesses while also protecting their interests.

**Objectives of the Street Vendors Act, 2014:**

1. **Regulation of Street Vending:**
  - The Act aims to regulate street vending activities by **demarcating vending zones and implementing a participatory process** for the formation of **Town Vending Committees (TVCs)**.
  - Town Vending Committees (TVCs) will comprise street vendor representatives **comprising 40% of members, including 33% women**. These committees oversee vendor inclusion and address grievances.
  - The Street Vendors Act ensures the inclusion of all existing vendors in vending zones **by issuing vending certificates**
2. **Protection of Livelihoods:**
  - The Act intends to protect the livelihoods of street vendors by providing **legal recognition for their occupation and preventing arbitrary evictions**.
3. **Promotion of Inclusive Urban Development:**
  - The Act seeks to promote **inclusive urban development** by integrating street vendors into the urban planning process and ensuring their participation in decision-making.
4. **Ensuring Social Security and Welfare:**
  - The Act aims to improve the **social security and welfare of street vendors** by providing them with access to credit, social schemes, and protection against harassment.
5. **Recognition of Rights:**
  - The Act recognizes the **rights of street vendors to carry out their trade without harassment**, arbitrary confiscation of goods, or extortion.
6. The Act also proposes a **Grievance Redressal Committee chaired by a civil judge or judicial magistrate** and mandates periodic surveys by States/ULBs to identify street vendors every five years.

**Evaluating the objectives**

1. **Positive Impact on Regulation:**
  - The Act has brought about a **more structured approach to street vending by delineating vending zones**

and involving vendors in decision-making through TVCs.

- **For Example:** In Pune, the implementation of the Act resulted in the formation of TVCs, leading to better organization of street vending activities.

## 2. Safeguarding Livelihoods:

- The Act has provided legal recognition to street vending as a legitimate occupation, preventing arbitrary evictions and securing the livelihoods of vendors.
  - **Example:** In Ahmedabad, vendors' livelihoods were protected as the Act prevented their eviction without proper procedures.

### Challenges in Implementation:

Despite the Act's intentions, challenges such as lack of awareness among vendors, delayed survey and certification, and resistance from local authorities have hindered effective implementation. **Example:** In some cities, vendors' access to vending certificates has been delayed due to administrative bottlenecks.

1. **Administrative challenges:** A) Increased harassment and evictions of street vendors. B) Outdated bureaucratic mindset regarding vendors. C) Lack of awareness about the Act among authorities and vendors. D) Limited influence of street vendor representatives and tokenistic representation of women vendors.
2. **Governance challenges:** A) Weak urban governance mechanisms. B) Lack of integration with the 74th Constitutional Amendment Act. C) Insufficient powers and capacities of ULBs. D) Top-down urban policies ignoring provisions for vendor inclusion.
3. **Societal challenges:** A) Exclusionary perception of 'world-class cities' marginalizing vendors. B) City planning and policies view vendors as obstacles to urban growth rather than contributors to the economy.

### Way forward:

Ensure timely implementation, addressing gaps in schemes' accessibility, awareness, and identification. Provide benefits such as maternity allowances, accident relief, and education support. States should prevent harassment of street vendors, safeguarding their right to livelihood. Enhance ULBs' capacity to plan for street vending. Tackle issues like climate change impact, increased vendor numbers, e-commerce competition, and income reduction

### Other Initiatives for Street Vendors:

1. **SVANidhi Scheme:** Launched to support over 50 lakh urban street vendors, including those from peri-urban/rural areas. It promotes digital transactions with cash-back incentives of up to Rs. 1,200 annually.
2. **National Association of Street Vendors of India**

**(NASVI):** An organization dedicated to safeguarding the livelihood rights of street vendors nationwide. NASVI unites street vendor organizations to advocate for systemic changes.

### Conclusion

The Street Vendors Act, 2014, has made significant strides in regulating street vending activities and safeguarding the rights of vendors. Despite challenges in implementation, the Act's objectives of providing legal recognition, promoting inclusive urban development, and ensuring social security for street vendors mark a positive step towards integrating this informal sector into the urban fabric of India.

### Mains Link:

Q. How has globalization led to the reduction of employment in the formal sector of the Indian economy? Is increased informalization detrimental to the development of the country? (UPSC 2016)

## 8. ISSUES WITH INDIA'S FOOD REGULATORY SYSTEM

### Context:

Controversies surrounding food safety in India have put the spotlight on the country's regulator, [FSSAI](#).

### Recent cases of food issues in India:

1. **Allegations against Nestle's baby food products** for unhealthy sugar content.
2. **Concerns over carcinogenic additives** in powdered spices, including MDH and Everest brands.
3. US customs **declined entry to 31% of MDH spice-related shipments** due to salmonella contamination.
4. **Indian food exports face scrutiny in international markets** like the EU, indicating global apprehensions regarding the safety and quality of Indian food products.

### India's response:

1. **Spices Board announced corrective measures** including mandatory testing of consignments to Singapore and Hong Kong.
2. **Collaborating with exporters** to address issues and propose corrective measures.
3. **Issued guidelines to exporters** on preventing Ethylene Oxide (ETO) contamination.
4. **FSSAI directed state regulators** to test major spice brands for ETO presence.
5. **Planning nationwide surveillance** in 2024-25 for various food products.
6. **Nearly one-fourth of samples** tested in the last three years failed regulatory standards.

### Operational Food Safety Regulations in India:

1. **Regulator:** The Food Safety and Standards Authority

of India (FSSAI) is the autonomous body overseeing food safety under the [Food Safety and Standards Act, 2006](#).

2. **Role:** FSSAI regulates the manufacturing, processing, distribution, sale, and import of food to ensure safe consumption.
3. **Key Regulations:**
  - a. **Food Safety and Standards Act, 2006:** Establishes FSSAI and State Food Safety Authorities, aiming for a single reference point for food safety standards.
  - b. **Food Safety and Standards Rules, 2011:** Includes provisions for the Food Safety Appellate Tribunal, Organic Food standards, and regulates Food Advertising.
    - i. **Covers Licensing, Registration, Packaging, Labelling,** Food Product Standards, and Food Additives Regulation.

**Challenges to Food Safety in India:**

Challenges	Examples
1. Rampant Adulteration	Milk is adulterated with diluted water, detergent, fat, and urea.
	Adulteration of spices and edible oils. Synthetic sweeteners in cakes lead to fatalities.
2. Feeding of 'empty calories'	Packed food products containing high levels of added sugar. Leading to diabetes, cardiovascular diseases, and obesity.
3. Weak Enforcement and Accountability	Many food businesses operate without proper licenses.
4. Corrupt practices by FMCG players	Violation of labelling requirements (e.g., Maggi noodles). Ban due to high levels of lead, and MSG.
5. Limited Public Awareness	Unawareness of food safety practices among the populace.
	Overuse of pesticides and fruit ripening agents.
6. Complex Regulatory Framework	Difficulties for small and medium enterprises to comply.
	Regulatory gaps, inconsistencies in enforcement.
7. Operational Challenges	Lack of standardized recordkeeping, and intentional food fraud.
	Difficulty in tracing ingredients, and assessing risks.
8. Logistical Barriers	10 States/UTs lack notified food testing labs.
	Uneven distribution, and insufficient number of food safety officers.
9. Lack of Transparency	Non-disclosure of testing results to the public.
	Surveys not effectively addressing adulteration practices.
10. Issues with FSSAI	<b>Staff and Infrastructure Shortages:</b> FSSAI faces persistent challenges with staffing and infrastructure, hindering its monitoring and regulatory capabilities.
	<b>Perceived as Paperwork:</b> Many businesses see FSSAI regulations as bureaucratic hurdles rather than opportunities for guidance and inspection.
	<b>Procedural Shortcomings:</b> Instances like the Vital <b>Neutraceuticals case</b> reveal procedural errors in FSSAI's actions, undermining its enforcement credibility.

**FSSAI initiatives:**

Initiative	Description
<a href="#">Eat Right India Movement</a>	Launched to transform the food system for safe, healthy, and sustainable food aligned with the <b>National Health Policy 2017</b> , focusing on preventive and promotive healthcare.
<a href="#">Eat Right Station Certification</a>	Awarded by FSSAI to railway stations meeting food safety benchmarks under the Food Safety and Standards Act, 2006, ensuring safe and wholesome food for passengers.
<b>Food Hygiene Rating Scheme</b>	Developed by FSSAI for certifying food businesses supplying food directly to consumers, on or off-premise, indicating their hygiene standards.
<a href="#">Food Safety Mitra scheme</a>	Aims to create a network of <b>Food Safety Mitras (FSM)</b> to assist Food Business organisations (FBO) with licensing, registration, training, auditing hygiene, and other food safety measures.

<a href="#">State Food Safety Index</a>	Developed by FSSAI to <b>measure states' performance on compliance, human resources</b> , food testing infrastructure, training, and consumer empowerment, providing insights into food safety practices across regions.
<b>World Food Safety Day</b>	To raise awareness about food safety issues and promote actions to ensure safe and nutritious food globally.
<a href="#">Eat Right Mela</a>	Events organized under the <b>Eat Right India Movement</b> to educate people about healthy eating habits, food safety, and nutrition.
<a href="#">RUCO (Repurpose Used Cooking Oil)</a>	Initiative promoting the <b>conversion of used cooking oil into biofuel</b> to prevent its reuse in food, reducing health hazards and environmental pollution.
<a href="#">100 Food Streets</a>	Initiative to ensure <b>food safety standards in street food</b> by training vendors, improving hygiene practices, and monitoring compliance, enhancing consumer confidence in street food.

**Proposed Amendments in Food Safety and Standard Regulations:**

- Elimination of Multiple Certifications:** Aim to abolish BIS and AGMARK certification requirements, mandating only FSSAI certification.
- Facilitation of Ease of Doing Business:** Align with 'One Nation, One Commodity, One Regulator' vision to simplify regulations.
- Expansion of Standards:** Include standards for Mead, Alcoholic RTD beverages, and introduce standards for the 'Haleem' dish.

**Way forward:**

- Strengthen Infrastructure and Resources:** Increase investment in labs, training facilities, and regulatory bodies.
- Simplification of Regulations:** Make regulations more accessible and business-friendly.
- Strict Enforcement and Accountability:** Ensure rigorous enforcement with penalties for violations.
- Enhancement of Public Awareness:** Launch a comprehensive awareness campaign on food safety.
- Encouragement of Responsible Agricultural Practices:** Promote sustainable farming to reduce contamination risks.

**Mains Links:**

Q. Elaborate the policy taken by the Government of India to meet the challenges of the food processing sector. (UPSC 2021)

**Prelims Links:**

**Q. Consider the following statements: (UPSC 2018)**

- The Food Safety and Standards Act, 2006 replaced the Prevention of Food Adulteration Act, 1954.
- The Food Safety and Standards Authority of India (FSSAI) is under the charge of Director General of Health Services in the Union Ministry of Health and Family Welfare.

**Which of the statements given above is/are correct?**

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

**Ans: A**

## 9. HIGHER EDUCATION IN INDIA: STATUS, CHALLENGES AND SOLUTIONS

**Context:**

Indian higher education is experiencing heightened politicization, posing a serious threat to academic institutions and intellectual freedom.

India boasts one of the world's largest higher education systems, including prestigious institutions like IITs and IIMs. Despite its vastness, **challenges such as quality and relevance persist**. Additionally, **increasing politicization** poses a threat to academic freedom and intellectual discourse.

**Status of Higher Education in India:**

Aspect	Status
Student Enrolment	Over 4 crore students enrolled in higher education institutes in 2021-22.
	A significant increase from about <b>3.42</b> crore in 2014-15.
	Women enrolment: Over 2 crore in 2021-22, up by 32% from <b>1.5</b> crore in 2014-15.
	The highest proportion of women enrolment at the postgraduate level (over 55%).
Gross Enrolment Ratio (GER)	Estimated GER for age group 18-23 years: <b>28.4%</b> .
The primacy of Government Institutions	<b>About 73.7% of students</b> attend government universities, comprising <b>58.6%</b> of all universities.
	State public universities have the largest share of enrollment (around 31%) among government-owned universities.

**Regulatory Framework Of Higher Education In India**



**Primary Challenges in the Indian Higher Education System:**

- 1. Politicization of higher education:** Concerns rise over politicization in higher education, impacting autonomy in faculty recruitment, curriculum design, and resource allocation.
  - a. E.g., Controversies around the appointments of Governors as Chancellors and Vice Chancellors, undermining institutional independence.
- 2. Limited Funding:** Interim Budget 2024-25 slashes education allocation by 7%, with UGC funding cut by 61%.
- 3. Low R&D investment:** It remains low at 0.64% of GDP, compared to **China (2.4%), Germany (3.1%), South Korea (4.8%), and the US (3.5%).**
- 4. Uneven Regional Development:** Higher education institutions are unevenly distributed, with states like Delhi, Tamil Nadu, and Maharashtra having higher concentrations of reputed institutions.
- 5. Quality of Education:** The quality of education in many institutions falls short compared to other developing nations.
  - a. E.g. A study by the **National Employability Report** highlighted the industry’s perception of the **outdated curriculum** in many Indian universities.
- 6. Faculty Shortage:** There is a significant shortage of qualified faculty across institutions.
  - a. E.g. **AISHE data** indicates a faculty shortage in many institutions, with a **high student-to-faculty ratio**.
- 7. Lack of Research and Innovation:** Indian institutions often lack a strong focus on research and innovation. **For instance, India ranks lower in global innovation indices**, indicating a need for increased emphasis on research and development.
- 8. Affordability:** Higher education is often unaffordable for many students.
  - a. For example, **AISHE reports** show disparities in enrolment rates among **different social groups**.
- 9. Equity and Access:** A report titled **“Gender and Higher Education in India: Negotiating Equity with Access”** attempts to outline the multiple dimensions of gender asymmetries and discrimination that occur in higher education institution
- 10. Inadequate Infrastructure:** Many institutions lack the necessary infrastructure.
  - a. E.g. According to the **All India Survey on Higher Education (AISHE) 2019-20**, many colleges lack basic amenities, affecting the quality of education.
- 11. Job Market Alignment:** There is often a mismatch between the skills students acquire and what the job market requires. A report titled **“EMPLOYABILITY AND ENTREPRENEURSHIP IN INDIAN UNIVERSITIES”** shows that **employ-**

ability in the country is only 47%.

#### Impact on Quality:

1. **Skill Gap:** The gap between the curriculum and industry needs results in a workforce lacking in essential skills.
2. **Inadequacy in Research:** The lack of focus on research and innovation limits the country's capacity to contribute to global knowledge and technological advancements.

#### Government Initiatives:

Initiative	Description
<a href="#">National Education Policy (NEP) 2020</a>	Aims to overhaul the education system, and promote multidisciplinary learning, skill development, and research. Targets 50% Gross Enrolment Ratio by 2035.
<a href="#">Institutions of Eminence (IoE) Scheme</a>	Launched in 2018, grants 20 institutions complete autonomy.
<a href="#">National Credit Framework</a>	Integrates training and skill development into education, and stores student credits digitally.
<a href="#">Revamped Accreditation and Ranking Systems</a>	NIRF ranks institutions, and NAAC ensures quality standards.
<b>Digital Initiatives</b>	SWAYAM offers online courses, National Digital Library provides educational resources.
<b>Study in India Program</b>	Attracts international students with scholarships and streamlined admission process.
<b>Foreign Institutions in India</b>	Regulations allow the top 500 foreign universities to establish branch campuses.
<a href="#">SHE under INSPIRE</a>	Scholarship to attract students to study basic sciences and pursue research careers.

#### Measures to Address Challenges:

1. **Infrastructural, Academic and Faculty Reforms:** Improving infrastructure and implementing academic and faculty reforms can **enhance the quality of education**. For instance, the **Rashtriya Uchchatar Shiksha Abhiyan (RUSA)** aims to upgrade infrastructure in higher educational institutions
2. **Increase Representation of States in UGC:** Increasing the representation of states in the University Grants Commission (UGC) can help address regulatory challenges.
3. **Availability of Quality Textbooks in Local Language:** Providing quality textbooks in local languages can improve access to education. **The National Council of Educational Research and Training (NCERT)** has been publishing quality textbooks in various local languages.
4. **Government Financial Support:** Government finan-

cial support can make higher education more affordable.

- a. Schemes like the **Pradhan Mantri Vidya Lakshmi Karyakram** provide educational loans to students.
5. **Implementation of New Education Policy:** The implementation of The NEP 2020 aims to overhaul the education system by introducing a **new curriculum structure, promoting multilingualism, and focusing on skill development**.
  6. **Strengthening Quality Assurance Institutions:** Strengthening institutions like the **National Assessment and Accreditation Council (NAAC)** can ensure quality assurance.
  7. **Digital Education:** The Government of India has launched several initiatives like **SWAYAM**, an online education platform, to promote digital education.
  8. **Public-Private Partnerships (PPP):** PPP models have been successful in improving the education system. For example, the **Delhi Public School Society** operates schools in collaboration with private entities.

#### Other measures needed:

1. **Shift focus to practical skill development** through project-based learning, internships, and industry collaborations.
2. Encourage universities to engage in **social development projects** to promote civic engagement.
3. **Enhance the National Digital Library** and promote open educational resources.
4. **Establish entrepreneurship and innovation centres** within universities.
5. **Promote transnational education partnerships** with international universities.
6. **Implement dual study programs** combining theoretical learning with practical training.
7. **Adopt a competency-based credentialing system** with blockchain certificates.

#### Conclusion

A **revitalized higher education system** will not only contribute to the intellectual growth of the nation but also position India as a competitive force on the global educational stage. It is an investment in the nation's intellectual capital, fostering innovation, critical thinking, and socio-economic development.

#### Insta Links:

- [An ambitious push for values, and ethics in higher education](#)

#### Mains Link:

**Q1. How have digital initiatives in India contributed to the functioning of the education system in the country? Elaborate on your answer. (USPC 2020)**

**Q2. Discuss the main objectives of Population Education**

and point out the measures to achieve them in India in detail. (USPC 2021)

**Prelims Link:**

**Q. Which of the following provisions of the Constitution does India have a bearing on Education? (UPSC 2012)**

1. Directive Principles of State Policy
2. Rural and Urban Local Bodies
3. Fifth Schedule
4. Sixth Schedule
5. Seventh Schedule

**Select the correct answer using the codes given below:**

- (a) 1 and 2 only
- (b) 3, 4 and 5 only
- (c) 1, 2 and 5 only
- (d) 1, 2, 3, 4 and 5

**Ans- D**

Topics: Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests.

## 10. IRANIAN PRESIDENT'S DEATH AND ITS IMPACT ON GEOPOLITICS

**Context:**

Iranian President Ebrahim Raisi's death in a helicopter crash raises questions on middle east geopolitics.

**About Ebrahim Raisi:**

Born December 14, 1960, he rose from a **clerical family in Mashhad, Iran**, to hold prominent positions in the government, including Tehran's prosecutor and Iran's judiciary chief. He ran for presidency in 2017 and won in 2021.

Notably, **he strengthened ties with Russia and China** while resuming diplomatic relations with Saudi Arabia. His support for **Palestine and alleged involvement in human rights violations** drew international attention. As president, he faced **criticism for crackdowns on protests and escalated conflicts** with Israel and the West.

**Iranian Internal Politics:**

In Iran, politics has long been defined by a **struggle between conservatives (to which Raisi belonged) and reformists** since the 1979 Islamic Revolution. Conservatives advocate **strict adherence to Shi'ite Islam's** principles and view the Revolution as anti-Western imperialism, enjoying support from poorer sectors.

**Reformists, while loyal to the Revolution**, seek greater flexibility domestically and internationally, advocating for women's rights, civil society, free elections, and improved relations with the West. Despite economic challenges from sanctions, conservatives have largely retained power, even amidst protests.

**Impact of his death:**

1. **Iran's Political Structure:** The President operates under the Supreme Leader's authority, with upcoming elections within 50 days. Since Iran has a robust public institution, smooth transition is anticipated. Constitutional provisions dictate Mohammad Mokhber, Iran's First Vice President, assumes the acting presidency.
2. **Global Implications:** Iran's policies towards South Asia and Arab states are expected to persist. Gold prices surged post-Raisi's death, reflecting global market concerns.
3. **Impact on India:** Chabahar Port development might slow, affecting global oil markets due to Iran's significant production. Increased oil prices could impact India's economy. Potential tensions in West Asia could further influence India, depending on developments.

**Different aspects of India-Iran Relations:**

Aspect	Details
<b>Historical Relations</b>	Millennia-long interactions, dating back to ancient times. Trade between southern Iran and India through Persian Gulf and Arabian Sea
<b>Political Relations</b>	<b>Friendship treaty signed in 1950;</b> Tehran Declaration (2001) and New Delhi Declaration (2003) set strategic vision; Trilateral Agreement on Trade, Transport, and Transit
<b>Connectivity</b>	MoU signed in 2015 for Shahid Beheshti Port development at Chabahar; Strategic cooperation for Chabahar Port as regional and international hub
<b>Trade Relations</b>	<b>Bilateral trade reached US\$2.5 billion</b> in 2022; India among Iran's top trade partners; Major Indian exports: rice, tea, sugar, pharmaceuticals, electrical machinery, artificial jewelry; Major imports: dry fruits, chemicals, glassware
<b>Cultural Cooperation</b>	Civilizational links foster robust people-to-people ties; Indian Cultural Centre renamed Swami Vivekananda Cultural Centre (SVCC); Farsi included in New Education Policy as classical language
<b>Energy Security</b>	<b>Iran ranks 2nd globally in gas reserves;</b> Iran presents opportunity for fuel diversification, decarbonization, and gas share in India's energy mix

<b>Strategic Importance (For India)</b>	Strategic location between Persian Gulf and Caspian Sea; Provides alternative connectivity to Afghanistan and Central Asian republics; Access to crude oil and natural gas reserves
<b>Strategic Importance (For Iran)</b>	Access to large market for oil sales; Improving trade ties and investment opportunities in India; India can be leveraged for its ties with West as India enjoys good relations with most of the countries.
<b>Areas of Convergence</b>	<b>Engagement with Afghanistan:</b> Potential for common policy with open channels to Taliban; <b>Rebalancing in West Asia:</b> Opportunity to strengthen ties amid regional dynamics

**For: Israel-Iran Conflicts: Challenges and Solutions: Click Here**

**Challenges:**

Indo-Iranian ties have faced challenges, including **India’s halt of oil imports from Iran** due to U.S. sanctions post the Iran nuclear deal revocation in May 2019, impacting India’s energy security. Moreover, **India’s close relations with Israel** contrast with Iran’s ties with China, underlined by a 25-year strategic partnership agreement. Additionally, **Iran-backed Houthis** in Yemen have targeted Saudi Arabia and UAE, both key partners of India. **Iran’s criticism of India’s abrogation of Article 370**, granting special status to Kashmir, further strained relations.

**Way forward:**

- Unlocking Bilateral Potential:** Strengthening India-Iran ties could unlock vast potential for regional and global cooperation, benefiting both nations.
- Cheaper Crude Oil:** Resuming oil imports from Iran could lower crude oil prices globally, benefiting multiple countries and encouraging market stability.
- Connectivity with Eurasia:** Enhancing cooperation on the International North-South Transport Corridor (INSTC) could significantly reduce transit times for goods between India, Iran, Afghanistan, Russia, Central Asia, and Europe, boosting trade.
- Energy Security:** Advancing projects like the Iran-Oman-India gas pipeline (IOI) could enhance energy security for India

**Conclusion:**

**Ebrahim Raisi’s tragic death** in a helicopter crash is not expected to significantly impact domestic markets unless it triggers geopolitical tensions.

India-Iran should focus on **areas of mutual interest and convergence**, working together to achieve common goals. **India’s assertive diplomacy**, emphasizing cooperation with neighbors and friends, presents an opportunity for renewed engagement with Iran and unlocking vast cooperation potential. A reset in relations is timely and promising.

**Insta Link:**

[Gaza conflict: India-Israel Relations](#)

**Prelims Link:**

**Q) What is the importance of developing Chabahar Port by India? (UPSC 2017)**

- (a) India’s trade with African countries will enormously increase.
- (b) India’s relations with oil-producing Arab countries will be strengthened.
- (c) India will not depend on Pakistan for access to Afghanistan and Central Asia.
- (d) Pakistan will facilitate and protect the installation of a gas pipeline between Iraq and India.

**Ans: C**

## 11. SQUAD AND THE RISE OF MINILATERALISM IN THE INDO-PACIFIC

**Context:**

The rise of Chinese aggression in the Indo-Pacific has led to the formation of **Squad—a minilateral group comprising the US, Japan, Australia, and the Philippines** (a testament to the growing importance of “**minilateralism**”).

**What is minilateralism?**

It involves **small groups of nations collaborating** to tackle problems or pursue mutual goals.

- **Nature:** Informal, flexible, voluntary frameworks with varied situational interests, shared values, or relevant capabilities.

**Reasons for the rise of minilateralism:**

- Dysfunctional multilateral institutions:** Lack of consensus and gridlock due to diverse interests and ideologies.
- Flexibility and agility:** Allows quicker decision-making and targeted cooperation.
- Issue-based cooperation:** Enables like-minded countries to address specific mutual interests.
- Changing ‘Balance of Power’:** The emergence of aggressive China led to formations like QUAD, and AUKUS.

**Concerns with rising Minilaterals:**

- Legitimacy and inclusiveness:** Lack of inclusiveness may undermine the interests of the Global South.
- Limited resources and capabilities:** Smaller groups

may lack sufficient resources for complex challenges.

3. **Tensions and divisions among countries:** Potential for exclusionary bloc politics.
4. **Accountability and transparency:** Informal structure raises concerns about democratic oversight.

### Reasons Behind India, historically, supporting multi-lateral Agreements

1. **Collective negotiation power** – Mutual interest groups (Developing block, G77 etc.,) can collectively push the concerns of developing countries as a whole— IP rights, Labour laws, Environmental norms, Rate of tariff, and the proposal for tariff reduction to suit the requirements of the concerned countries.
2. **India's vision of the Multi-Polar world** – India does not want to be part of a bipolar or unipolar world – For that, a multilateral forum like WTO with Equal voice equal votes and full negotiation power for all concerned parties is the best forum.
3. **It connects India to the global value chain** - Multi-lateral agreements lead to India becoming a part of the global value chain.
4. **Failure of regional agreements:** For example in the case of SAARC where negotiations like SAFTA are usually marred by bilateral issues such as acrimony between India and Pak.

**Evolving global order and the changing nature of threats** are posing difficult questions on the continued relevance of multilateral frameworks. **Bilateral, Pluri lateral and Mini laterals** can help in framing targeted partnerships that can focus energies on shared interests and concerns in the current geopolitical situations.

### Should India change its stance and go for Bi-lateral/ Mini-laterals rather than Multi-laterals? Yes.

- **Importance of the bilateral agreements for India:** 72.6% of India's imports are from merely 15 countries and 60.5% of exports go to just 15 countries.
- **Bilateral agreements have the following other benefits**
  - Bilateral trades can be concluded Swiftly
  - Improves friendly relations
  - Negotiations possible with practical aims
  - Mutual compromise and accommodation at a fast pace when compared to multilateral routes
- **Increased tensions and retreat of war in Europe** – For example During the **Russia –Ukraine** conflict, India has taken a strategic stand based on the national interest which was not possible being a part of multilateral Western groups who were opposed to trade with Russia.
- **Bilateral engagements with some nations are so important that it impossible to negotiate in multi-lateral forums**
  - **Russia** (Strategic and Military partner)
  - **Israel** (Military partnership and the technol-

- ogy transfer)
- **US** (Strategic and diplomatic partner and as a balance to China )
- **Japan** (Economic partnership)
- **Australia** (Co-operation in the Blue Economy and Indo-pacific region)

- **There is a growing importance of strategic alliances over global cooperation.** These initiatives can facilitate the creation of issue-specific partnerships between like-minded countries.
  - For instance, mini laterals can provide a forum to strengthen defence and security cooperation in new regional theatres, such as the Indo-Pacific.
- **Easy cooperation of likeminded with converging interests** –A range of mini laterals have been created to advance the interests of like-minded countries, such as
  - The Quad
  - the India-Japan-US trilateral
  - the India-France-Australia trilateral
- **Better decision-making and coordination:** With a smaller membership, they can expedite decision-making and facilitate policy coordination on important focus areas.
- **Seeking Informal dialogues:** Trilateral are an effective way to discuss emerging issues in a flexible manner without establishing rigid commitments and going through lengthy formal negotiations

### Challenges:

**The rise of minilateralism has disrupted international inter-dependence** and globalization, leading to fragmented global governance mechanisms. This is evident in the ambiguity of QUAD's strategic interests in countering Chinese aggression.

### Conclusion

However, India **should take a balanced view and engage** with trading partners bilaterally and through plurilateral and multi-lateral agreements forums depending on case to case basis.

### Prelims Link:

**Q. In which one of the following groups are all the four countries members of G20? (UPSC 2020)**

- (a) Argentina, Mexico, South Africa and Turkey
- (b) Australia, Canada, Malaysia and New Zealand
- (c) Brazil, Iran, Saudi Arabia and Vietnam
- (d) Indonesia, Japan, Singapore and South Korea

**Ans: A**

Topics: [Effect of policies and politics of developed and developing countries on India's interests, Indian diaspora.](#)

## 12. INDIA'S FOREIGN POLICY: CHALLENGE OF GLOBAL RISE BUT REGIONAL DECLINE

### Context:

India's **global rise contrasts sharply with its regional decline**, posing significant implications for its global ambitions. Despite burgeoning power on the world stage, **India's influence in South Asia** has diminished due to relative power shifts, particularly vis-à-vis China.

### India's Global Rise:

Evidence	Explanation
<b>Economic Growth</b>	India has experienced <b>robust economic growth over the past two decades</b> , positioning itself as one of the fastest-growing major economies globally.
<b>Military Capabilities</b>	India has <b>significantly enhanced its military capabilities</b> through modernization efforts, procurement of advanced weapons systems, and strengthening of defence infrastructure.
<b>Geopolitical Significance</b>	India's inclusion in <b>key global institutions like the G-20, invitation to G-7 meetings</b> , and active participation in multilateral groups like the <a href="#">Quad</a> , <a href="#">BRICS</a> , and the <a href="#">Shanghai Cooperation Organisation</a> highlight its growing geopolitical significance.
<b>Indo-Pacific Focus</b>	Growing <b>international attention on the Indo-Pacific region</b> underscores India's importance as a global player, given its central position geographically and strategically.
<b>Peer Accommodation</b>	Despite challenges, there is <b>notable peer accommodation of India's claims to be a globally significant power</b> , e.g., India is seen as a leader of the Global South; Numerous countries endorse India's claim for a permanent UN security council seat.
<b>Global Strategic Stability</b>	India's role in the Indo-Pacific is <b>considered pivotal to global strategic stability</b> , with increasing recognition from major powers and regional stakeholders alike.

<b>Soft Power</b>	<b>India's rich cultural heritage</b> , diverse traditions, young demography and soft power assets such as Bollywood, yoga, and cuisine contribute significantly to its global influence and attractiveness.
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### India's regional decline:

- Diminished Influence in South Asia:** India's influence in South Asia has declined compared to previous decades, e.g., decreasing influence in Maldives, Pakistan, Sri Lanka etc.
- Relative Power Shifts:** The rise of China has resulted in a relative decline of India's power in the region, as China's expanding influence challenges India's traditional dominance.
- Changes in Geopolitics:** India has lost primacy in South Asia, evidenced by the increasing willingness of South Asian countries to engage with China and other external powers independently of India's preferences.
- American Withdrawal:** The withdrawal of the United States from the region has created a power vacuum that China has been quick to fill, disadvantaging India's regional position.
- Balancing Strategies:** South Asian countries are increasingly engaging in balancing, bargaining, hedging, and bandwagoning strategies vis-à-vis India, viewing China as a useful hedge against India's dominance.
- China's Rise:** China's rise in South Asia, coupled with its **Belt and Road Initiative (BRI)** projects in the region, has altered the regional balance of power in China's favour.
- Obsolescence of South Asia as a Geopolitical Construct:** The growing obsolescence of South Asia as a geopolitical construct has further marginalized India's role in the region, diminishing its hold and influence.

### What is India's Neighborhood First Policy?

It emphasizes **peaceful relations and collaborative development with South Asian neighbours**. It covers diverse areas like economics, technology, connectivity, defence, and environment. The policy **complements India's Look East and Look West Policies, focusing** on Southeast Asia and the Middle East respectively. It was initiated by Narendra Modi and furthered by key figures like Sushma Swaraj and S. Jaishankar, with support from NSA Ajit Doval and successive Foreign Secretaries.

### Various aspects of India's Neighbourhood First Policy:

- Priority to neighbouring countries:** Emphasis on strong ties with immediate neighbours.
- Mutual respect and understanding:** Based on shared interests and Panchsheel principles.

3. **Connectivity and infrastructure:** Focus on physical and digital connectivity for trade and integration.
4. **Economic cooperation:** Deepening economic ties through trade facilitation and investment.
5. **Security cooperation:** Joint efforts to address security challenges like terrorism
6. **Cultural exchanges:** Promoting friendship and understanding through cultural diplomacy.

**Way Forward:**

1. **Geopolitical Adaptation:** India needs to modernize its foreign policy approach to align with the changing geopolitical landscape.
2. **Recognizing Regional Shifts:** Acknowledge significant changes in the region and its dynamics over the past fifteen years.
3. **Leveraging Strengths:** Prioritize leveraging India's strengths instead of direct competition with China, focusing on tailored approaches to regional engagement.
4. **Maritime Advantage:** Capitalize on India's maritime strengths in the Indo-Pacific to overcome continental limitations and boost trade and strategic alliances.
5. **Engaging Neighbors:** Integrate smaller South Asian neighbours into Indo-Pacific dialogues and initiatives to enhance regional cooperation and coordination.
6. **Expanding Partnerships:** Collaborate with allies to engage countries like Sri Lanka, the Maldives, and Bangladesh in the Indo-Pacific strategy, pulling them away from China-led initiatives.
7. **Soft Power Utilization:** Utilize India's soft power assets to maintain influence, fostering informal contacts and conflict management processes.
8. **Informal Diplomacy:** Encourage informal engagements with civil society actors to bridge diplomatic gaps and address sensitive regional issues.
9. **Diplomacy for Development:** India should integrate economic diplomacy with political diplomacy to attract foreign investment, technology transfer, and support for key national development initiatives like Make in India and Smart Cities.
10. **Ethical Foreign Policy:** India should aim to infuse ethical principles into its foreign policy, reclaiming moral leadership globally, as advocated by Mahatma Gandhi.

- and Road while engaging with the US and the West to build domestic capacities.
4. **Economic Engagement:** India deepens economic ties globally, seeking markets, raw materials, and recipients of foreign aid.
5. **Multi-Aligned Approach:** India participates in various international forums, articulating and promoting its priorities directly.
6. **Non-Interference Principle:** India avoids interfering in other countries' internal affairs but intervenes if actions threaten its national interests.
7. **Vasudhaiva Kutumbakam Principle:** India embraces the concept of "The World is One Family," promoting global harmony and growth through the principles of "Sabka Saath, Sabka Vikas, Sabka Vishwas."
8. **Proactive Democracy Promotion:** India provides proactive assistance in capacity building and institution strengthening to promote democracy globally, with explicit consent from concerned governments (e.g., Afghanistan).
9. **Global Problem Solving:** India advocates for global cooperation and consensus on issues of global significance such as world trade, climate change, terrorism, intellectual property rights, global governance, and health hazards.

**Conclusion:**

Failure to reconcile this paradox may hinder India's aspirations for global leadership.

**Insta Links:**

- [Impact of Gaza conflict on India's foreign policy](#)

**Mains Links:**

Q. "The long-sustained image of India as a leader of the oppressed and marginalised nations has disappeared on account of its newfound role in the emerging global order." Elaborate. (UPSC 2019)

Q. Evaluate the economic and strategic dimensions of India's Look East Policy in the context of the post-Cold War international scenario. (UPSC 2016)

I

**Foreign policy principles India is using:**

1. **India First Policy:** India prioritizes its national interests in its foreign policy decisions, asserting its independence and confidence on the global stage.
2. **Realistic Diplomacy:** India engages with the world based on its identity and priorities, maintaining confidence in its civilizational ethos and domestic realities.
3. **Balance of Power Strategy:** India strategically navigates its relationships, challenging initiatives like China's Belt

## GENERAL STUDIES – 3

Topics: Indian Economy and issues relating to planning, mobilization of resources, growth, development and employment.

### 1. PERFORMANCE OF THE INDIAN RUPEE AGAINST THE US DOLLAR IN THE LAST 10 YEARS

**Context:**

The rupee’s exchange rate has **weakened against the US dollar** in the last 10 years. But its **“real” strength against a basket of global currencies** has **improved**.

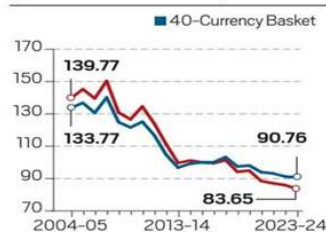
Before we analyse, 1<sup>st</sup> revise a few basic definitions:

Term	Definition
<b>Exchange Rate</b>	The rate at which <b>one currency can be exchanged for another currency</b> . It represents the value of one currency in terms of another currency. They are of three types:
	<b>Fixed Exchange Rate:</b> Governments or central banks set the value of their currency in relation to other currencies and maintain that value by buying or selling their own currency.
	<b>Floating Exchange Rate:</b> The value of a currency is determined by the forex market based on supply and demand. Most major currencies operate under this system.
	<b>Managed Float:</b> A mix of fixed and floating exchange rates where governments intervene occasionally to stabilize their currency’s value.
<b>Effective Exchange Rate</b>	The <b>weighted average of a currency’s exchange rates</b> against other currencies, is <b>adjusted for inflation and trade competitiveness</b> .
	Currency weights are derived from the share of individual countries in total foreign trade.
<b>Nominal Effective Exchange Rate (NEER)</b>	A simple average of bilateral exchange rates between the domestic currency and the currencies of major trading partners, <b>weighted by respective trade shares</b> .
	NEER measures the <b>overall strength or weakness of a currency</b> relative to a basket of other currencies without adjusting for inflation.
<b>Real Effective Exchange Rate (REER)</b>	Adjusts NEER for <b>differences in inflation rates</b> between the domestic economy and its trading partners. Reflects changes in the relative price levels of goods and services.
	Provides a <b>more accurate measure of a currency’s trade</b> competitiveness by accounting for changes in price levels.

**Status of the Indian Rupee in the last 10 years:**

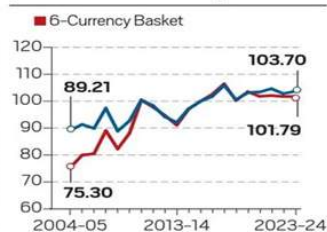
- The rupee fell from Rs **44.37 to Rs 60.34 (26.5%)** from 2004 to 2014 against the US dollar
- From 2014 to 2024, the rupee further depreciated from **Rs 60.34 to Rs 83.38 (27.6%)** against the US dollar.
- Between 2004 and 2024, the rupee declined by **32.2% (from 133.77 to 90.76)** as per the 40-currency basket NEER
- Despite this, between 2004 and 2024, the **rupee has undergone a smaller depreciation against the currencies of India’s major trading partners** compared to its depreciation solely against the US dollar.
- The **rupee’s trade-weighted REER for the 40-currency basket** has increased in the last 20 years, indicating that the **Rupee strengthened between 2004-05 and 2023-24**.

**TRADE-WEIGHTED NEER  
(BASE: 2015-16 = 100)**



Note: Figures are for April-March financial year.

**TRADE-WEIGHTED REER  
(BASE: 2015-16 = 100)**



Source: Reserve Bank of India

**Reasons for Indian Rupee to depreciate against US dollars:**

- Trade Imbalance:** Persistent trade deficits for India (as India imports more than the value of its exports) can put downward pressure on the rupee as more rupees are demanded to pay for imports compared to the dollars earned from exports.
- Capital Outflows:** The rate of investment through FDI and FII has reduced in the last few years.
- Inflation Differentials:** Higher inflation rates in India compared to the US can erode the purchasing power of the rupee, leading to depreciation against the dollar.
- Interest Rate Differentials:** Lower interest rates in India relative to the US can reduce the attractiveness of Indian assets for foreign investors, resulting in capital outflows and rupee depreciation. Currently, the US interest rate is high.

**Reasons for Indian Rupee to strengthen against the currencies of India's major trading partners:**

- Trade Surplus:** India maintains a trade surplus with some of its major trading partners (including the USA). India has a trade surplus of over \$24b with the US). It can lead to increased demand for the rupee, strengthening its value relative to those currencies.
- Positive Economic Outlook:** Strong economic fundamentals and growth prospects in India compared to its trading partners can attract foreign investment, boosting demand for the rupee.
- Government Policies:** Government policies aimed at stabilizing the currency and promoting economic growth can instil confidence in the rupee, leading to its appreciation against other currencies.

**Implications of Currency Depreciation on the Indian Economy:**

**Positive Impacts:**

- Boosts Exports:** A cheaper rupee makes Indian exports more affordable for foreign buyers, potentially increasing demand and export earnings.
- Inward Remittances:** A weaker rupee enables higher remittances from overseas workers, increasing disposable income in India.

**Negative Impacts:**

- Higher Import Costs:** Imports become more expen-

sive, leading to inflationary pressures and impacting purchasing power.

- Costlier Foreign Debt:** Increased repayment burden on foreign debt due to the need for more rupees to settle debts.
- Discourages Foreign Investment:** Depreciation signals economic instability, potentially dissuading foreign investors from investing in India.

**Way Forward:**

**Enhancing Export Competitiveness, thereby Improving Indian Rupee Strength:**

- Improved Infrastructure:** Investments in transportation networks, ports, and customs clearance processes are crucial. Developing export promotion zones and specialized manufacturing zones is essential.
- Skill Development:** Implementing skill development programs to enhance the availability of skilled labour in export-oriented industries.
- Technology Adoption:** Incentivizing and promoting technology adoption, including automation, digitization, and Industry 4.0 technologies, to boost productivity, competitiveness, and innovation in the export sector.
- Internationalization of India Rupee**

**Insta Links:**

- [Internationalisation of rupee](#)

**Mains Links:**

**Q. It is essential to approach the internationalisation of the rupee cautiously, considering the potential advantages and risks associated with it. Critically examine.**

**Q. How would the recent phenomena of protectionism and currency manipulations in world trade affect the macroeconomic stability of India? (UPSC 2018)**

**Prelims link:**

**Q1. Which one of the following is not the most likely measure the Government/RBI takes to stop the slide of the Indian rupee? (UPSC 2019)**

- (a) Curbing imports of non-essential goods and promoting exports
- (b) Encouraging Indian borrowers to issue rupee-denominated Masala Bonds
- (c) Easing conditions relating to external commercial borrowing
- (d) Following an expansionary monetary policy

**Ans: (d)**

**Q2. Consider the following statements: (UPSC 2019)**

- The effect of devaluation of a currency is that it necessarily

2. improves the competitiveness of the domestic exports in the foreign markets
3. increases the foreign value of domestic currency
4. improves the trade balance

Which of the above statements is/are correct?

- (a) 1 only
- (b) 1 and 2
- (c) 3 only
- (d) 2 and 3

Ans: (a)

## 2. ISSUE OF FOOD INFLATION IN INDIA

### Context:

April's retail inflation data showed a **slight slowdown in overall price gains** to an 11-month low of **4.83%** according to the Consumer Price Index (CPI). However, **food price inflation accelerated, reaching a four-month high of 8.7%**.

### Recent Trends in Overall Inflation and Food Prices:

1. Food Price gains were **8.75% for rural consumers**, 19 basis points higher than for urban consumers.
2. Rural CPI stood at **5.43%**, significantly higher than the urban rate of **4.11%**.
3. **Cereals**, the heaviest category in food, increased to **8.63%**.
4. **A significant year-on-year increase** in the average prices of rice and wheat.
5. **Vegetables remained in double-digit inflation** for the sixth consecutive month, reaching **27.8%** due to soaring temperatures.
6. **Pulses also saw prolonged double-digit inflation**, extending to the eleventh month.
7. In 2023, while **world food prices experienced a significant decline from their 2022** highs, India saw persistently high food inflation, **reaching 9.5% in December 2023**. This contrasts sharply with global deflation of **-10.1%** during the same period.

### About Inflation in India:

	Description
<b>About</b>	<b>Inflation</b> refers to the <b>overall increase in the prices of goods and services</b> , coupled with a decrease in people's purchasing power.
Causes of Inflation	
<b>1. Demand-Pull Inflation</b>	It occurs when the <b>demand for goods and services surpasses the supply</b> . When there is high overall demand in the economy, consumers are willing to pay more for available goods and services, causing a general increase in prices.
<b>2. Cost-Push Inflation</b>	Cost-push inflation is fueled by a <b>rise in the production costs of goods and services</b> , this can result from factors such as increased incomes, elevated costs of raw materials, or disruptions in the supply chain.
<b>3. Wage-Price Inflation</b>	This form of inflation is often characterized as a feedback loop between wages and prices, <b>when workers demand higher wages, businesses may raise prices to offset the increased labour costs</b> and consequently, workers seek higher wages in response, perpetuating the cycle.
Different Indices for Measuring Food Inflation in India	
<b>1. Consumer Price Index (CPI)</b>	CPI for Industrial Workers (IW), CPI for Agricultural Labourer (AL), CPI for Rural Labourer (RL), and CPI for Urban Non-Manual Employees (UNME).
<b>2. Consumer Food Price Inflation (CFPI)</b>	CFPI is a component of the broader Consumer Price Index (CPI), where the Reserve Bank of India (RBI) utilizes the CPI-Combined (CPI-C) for this purpose. It monitors the price fluctuations of a particular selection of food items commonly consumed by households.

<b>3. Wholesale Price Index (WPI)</b>	The WPI tracks changes in the <b>prices of goods sold and traded in bulk by wholesale businesses to other businesses</b> . It specifically focuses on goods, and services are not part of it. It is utilized to monitor supply and demand dynamics in industries, manufacturing, and construction sectors.
	<b>Components:</b> Primary articles (Food Articles, Non-Food Articles) and other categories like Fuel and Power and manufactured Products.
	<b>Food Articles in WPI:</b> Cereals, Paddy, Wheat, Pulses, Vegetables, Fruits, Milk, Eggs, Meat, Fish, Oil Seeds.
	<b>Non-Food Articles in WPI:</b> Oil Seeds, Minerals, Crude Petroleum.
<b>Food inflation in India</b> is primarily calculated using <b>the Consumer Price Index (CPI) for Food and Beverages</b> , a key measure tracking price changes of a typical consumer basket. Food carries a weight <b>of 45.9% in the CPI</b> , but its contribution to overall inflation has risen from 48% in April 2022 to 67% in November 2023.	
Recent data from the government’s Household Consumption Survey indicates <b>a decline in food’s share of the consumption basket, dropping below 50%</b> for rural consumers and 39% for urban consumers.	

**Factors contributing to the drop in global food prices include:**

- An abundant supply of key crops:** Bumper harvests in 2023, particularly of wheat, resulted in a surplus in the global market, contrasting with concerns over supply disruptions in 2022.
- Improved supply from Russia and Ukraine:** Despite disruptions, both countries maintained wheat exports, easing supply anxieties.
- Lower demand for vegetable oils:** Increased vegetable oil supplies and reduced use for biofuel production led to an approx. 32% drop in the UN’s Vegetable Price Index.
- Slowing demand:** High inflation and economic recession fears reduced consumer demand, particularly in major food-importing regions, decreasing import demand and lowering global prices.

**India’s high food inflation amid falling global food prices can be attributed to several factors:**

- Limited transmission of global prices:** While world food prices decreased, India’s remained elevated due to limited transmission of international prices to domestic markets, except for edible oils and pulses.
- Export bans and import duties:** The Indian government imposed bans on certain food exports and provided import duty waivers, reducing global market influences on domestic prices.
- Domestic production challenges:** Weather conditions affecting crop yields, particularly for cereals, pulses, and sugar, contributed to supply shortages and higher prices domestically.
- Low stock levels:** Low stock levels for commodities like wheat and sugar exacerbated price pressures.

**Other Factors Contributing to India’s Elevated Food Inflation:**

Factors	Examples
<b>Temperature and Weather Challenges</b>	Adverse weather conditions, such as <b>weak monsoon predictions and heatwaves affecting crop yields</b> , particularly for cereals, pulses, and sugar, contribute to supply shortages and higher prices domestically.
	For example, <b>cereal and pulse inflation showed double-digit inflation in April 2024.</b>
<b>Changing preferences</b>	Increasing demand for proteins, processed & packaged foods facing structural shortages. <b>Per capita milk consumption up from 307 grams in 2013 to 427 grams in 2020.</b>
<b>Fuel Prices</b>	The increase in fuel prices, a key input in agriculture, has led to higher production costs.
	For instance, <b>a 1% increase in fuel inflation results in a 0.13% rise</b> in food inflation, with the effect declining gradually over the next 12 months.
<b>Supply Chain Disruptions</b>	Disruptions in the supply chain, including transportation constraints, labour shortages, and logistical challenges, decrease the availability of food products, causing prices to rise.
	For example, vegetables continued to experience double-digit inflation due to inefficient storage facilities leading to perishable item wastage.

<b>Global Effect</b>	Despite global food price decreases, India's food prices remain high due to limited transmission of international prices to domestic markets.	and on broken rice exports since September 2022 to maintain ample domestic supply and lower prices.
	The Russia-Ukraine war has acted as a deterrent for edible oils and pulses, it is a net exporter of vegetables.	<b>d) Ban on Stockpiling:</b> Regulations limit wheat stocks to 3,000 tonnes for traders, millers, wholesalers, and retail chains, and 10 tonnes for smaller retailers and shops to prevent excessive stockpiling.

**What makes controlling food inflation challenging in India?**

- Multi-dimensional factors** requiring coordinated policy response across fiscal, monetary, and trade - food inflation is influenced by global commodities, domestic supply constraints, changing preferences etc.
- The slow pace of structural reforms in agriculture marketing, storage and transport** - APMC Act modernization across states still a work in progress. Food Corporation of India suffers infrastructure deficiencies.
- External headwinds like energy costs beyond India's control** - 50% rise in global crude prices in 2021 transmitted to domestic inflation.
- Increasing climate risks makes agricultural output unpredictable** - Deficient rains in 2014-15 and 2015-16 affected production,
- Considerations around impact on vulnerable groups** like farmers, urban poor - Requires balancing inflation control with protecting incomes and consumption.
  - For example** - Farm loan waivers provided despite inflation concerns.

**Impact on the vulnerable population**

- Poor households spend over 50% of income on food**, hence highly vulnerable to food inflation. Bottom 20% income group faces food inflation of ~6% currently.
- Can push more households into poverty**- Declining real incomes and loss of purchasing power as food dominates expenditure.
- Shift towards lower quality and quantity food consumption** resulting in worsening nutritional outcomes. Rise in anemia, stunting indicators likely.
- Rural landless laborers and marginal farmers heavily affected** due to dip in rural wage growth and crop realization prices. Loss of livelihoods.
- Urban poor impacted as social security nets are inadequate.** May cut essential spending on health and education.

**Government steps to curb inflation:**

- Subsidized Commodities:** Government increases distribution of subsidized vegetables like onions and tomatoes, releases stocks of wheat and sugar to stabilize prices.
- Reduction in Import Duty:** Incentivizing pulse cultivation among farmers, reducing import duties on certain pulses to boost local availability.
- Export Bans:** Bans on wheat exports since May 2022

- Operation Greens:** Aims to stabilize Tomato, Onion, and Potato (TOP) crop supplies throughout the year across the country to minimize price fluctuations.
- Floor Prices:** Imposing a minimum export price (MEP) of \$800 per tonne (₹67 per kg) on onion exports from October 29 to December 31, 2023, amid rising onion prices due to delayed kharif onion arrivals.

**Recommendations by the ICRIER paper for containing food Inflation: [Click Here](#)**

**Conclusion**

Tackling food inflation needs a calibrated monetary response, investments in agriculture, stable trade policies and expanded social safety nets to protect the vulnerable like urban poor and landless rural households. Global cooperation on supplies and trade will also strengthen long-term price stability.

**Insta links:**

- [India's High Food Inflation](#)

**Mains Link:**

**Q. There is also a point of view that Agricultural Produce Market Committees (APMCs) set up under the State Acts have not only impeded the development of agriculture but also have been the cause of food inflation in India. Critically examine. (UPSC 2014)**

**Prelims Links**

**Q.1 Consider the following statements: (UPSC 2020)**

- The weightage of food in Consumer Price Index (CPI) is higher than that in Wholesale Price Index (WPI).
- The WPI does not capture changes in the prices of services, which CPI does.
- The Reserve Bank of India has now adopted WPI as its key measure of inflation and to decide on changing the key policy rates.

Which of the statements given above is/are correct?

- 1 and 2 only
- 2 only
- 3 only
- 1, 2 and 3

**Ans: (a)**

**Q 2. If the RBI decides to adopt an expansionist monetary policy, which of the following would it not do? (UPSC 2020)**

- Cut and optimize the Statutory Liquidity Ratio
- Increase the Marginal Standing Facility Rate

3. Cut the Bank Rate and Repo Rate

Select the correct answer using the code given below:

- a) 1 and 2 only
- b) 2 only
- c) 1 and 3 only
- d) 1, 2 and 3

Ans: B

### 3. ECONOMIC CAPITAL FRAMEWORK (ECF) OF RBI AND ITS IMPLICATIONS

#### Context:

The Reserve Bank of India (RBI) approved a record **transfer of ₹2,10,874 crore** to the Union government for 2023-24, more than **double the ₹87,416 crore** transferred last year. The RBI also increased the **Contingent Risk Buffer (CRB) to 6.50% from 6%**. This surplus is based on the **Economic Capital Framework (ECF) adopted in 2019**.

#### What is Economic capital?

Economic capital is the amount of capital that a firm (in this case RBI), usually in financial services, needs to ensure that it **stays solvent given its risk profile**. It includes **both realized and unrealized reserves**.

**Economic Capital Framework Objective:** The framework aims to balance the RBI’s autonomy with the Government’s development goals.

#### Reserve Bank of India’s Sources of Income:

<b>Source of Income</b>	Interest from Government Securities Open Market Operations (OMOs) Foreign Exchange Operations Interest on Loans and Advances Income from LAF
<b>Expenditure</b>	Operating Expenses Interest Paid on Deposits and Borrowings Currency Issue Expenses Provisioning for Contingencies and Reserves
<b>Surplus</b>	Net income is derived from the total income (sources of income) minus total expenditure (expenses). Reserve funds and contingency provisions for financial stability and emergencies.

#### About Economic Capital Framework (ECF)

The ECF provides a **method for determining risk provisions and profit distribution** under **Section 47 of the RBI Act, 1934**, requiring the central bank to pay profits to the government after provisions for **debts, asset depreciation, and staff contributions**. It was recommended by the **Expert Committee (headed by Bimal Jalan)** to Review the Extant Economic Capital Framework of the RBI.

#### The Bimal Jalan-led panel recommended:

1. **The total economic capital** should be maintained between **20.8% to 25.4%** of the RBI’s balance sheet.
2. **Risk Capital Frameworks:** Assess the adequacy of RBI reserves.
3. **Contingency Risk Buffer (CRB):** Maintain within **5.5%-6.5%** of the RBI’s balance sheet.
  - a. **The CRB is the country’s savings** for a financial stability crisis, which has been consciously maintained with the RBI in view of its role as Lender of Last Resort.
4. **Review Frequency:** Review ECF every five years, or sooner if risks change significantly.
5. **Accounting Year Alignment:** Sync RBI’s fiscal year (April-March) with the government’s from 2020-21 for better policy cohesiveness.
6. **Interim Dividend:** Remove the interim payout structure, restricting it to extraordinary circumstances.

**All recommendations were accepted by the RBI.**

**Reasons for Higher Dividend Transfers to the Government:**

- 1. Increased RBI Revenue:** Boosted by variable repo rate (VRR) auctions for bank funding amid tight liquidity.
- 2. Revaluation Gains:** Higher revaluation gains on forex reserves.
- 3. Interest Rates:** Increased interest rates on domestic and foreign securities.
- 4. Foreign Exchange Sales:** Higher gross sales of foreign exchange.
- 5. Rupee Depreciation:** Surplus transfer aided by the rupee's depreciation against the dollar.

**Implications of Surplus Transfer:**

- 1. Fiscal Relief:** Eases government fiscal management and boosts capex expenditure
- 2. Revenue Compensation:** Helps offset lower tax buoyancy and other revenue gaps.
- 3. Budget Support:** Provides a buffer to meet budget targets.
- 4. Offsetting Losses:** Mitigates potential losses from lower disinvestment, telecom payouts, or tax revenues.
- 5. Fiscal Management:** Enhances the government's ability to manage fiscal deficits.

**Reasons Against RBI Surplus Transfer to Government:**

- 1. Autonomy:** Preserves RBI's independence from government influence.
- 2. Financial Stability:** Ensures sufficient reserves for managing financial crises.
- 3. Risk Buffer:** Maintains a contingency risk buffer for unforeseen economic shocks.
- 4. Monetary Policy:** Supports effective monetary policy implementation without fiscal pressure.
- 5. Long-term Stability:** Prioritizes long-term economic stability over short-term fiscal gains.

**Conclusion:**

**Transferring the RBI surplus to the government provides immediate fiscal relief** and supports budgetary goals, but maintaining sufficient reserves is crucial for the RBI's autonomy and long-term financial stability. A balanced approach is essential for sustainable economic health.

**Insta links:**

[RBI Panel on Economic Capital Framework](#)

**Prelims Link:**

**Q. Which of the following statements is/are correct regarding the Monetary Policy Committee (MPC)? (UPSC 2017)**

1. It decides the RBI's benchmark interest rates.
2. It is a 12-member body including the Governor of RBI and is reconstituted every year.
3. It functions under the chairmanship of the Union Finance Minister.

Select the correct answer using the code given below:

- (a) 1 only
- (b) 1 and 2 only
- (c) 3 only
- (d) 2 and 3 only

**Ans: A**

**Q. If the RBI decides to adopt an expansionist monetary policy, which of the following would it not do? (UPSC 2020)**

1. Cut and optimize the Statutory Liquidity Ratio
2. Increase the Marginal Standing Facility Rate
3. Cut the Bank Rate and Repo Rate

Select the correct answer using the code given below:

- (a) 1 and 2 only
- (b) 2 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

**Ans: B**

[Topics: Infrastructure: Energy, Ports, Roads, Airports, Railways etc.](#)

**4. ANALYSIS OF INDIA'S AVIATION SECTOR**

**Context:**

IndiGo's recent order for 30 wide-body Airbus A350-900 aircraft has sparked interest in its plans for long-haul, low-cost air travel, and highlighted India's booming aviation sector

**What is a Long-haul, low-cost air travel model?**

It extends **low-cost carriers' operations to non-stop, long-duration flights at reduced fares**. Some examples include **Scoot, Jetstar, and French Bee**, which offer hybrid products and target underserved routes.

However, it faces challenges like **higher fuel costs, increased operating expenses for wide-body aircraft, and maintaining efficient operations**.

**Status of India's Aviation Sector:**

Aspect	Details
<b>Aviation Boom</b>	India is the <b>world's third-largest domestic aviation market</b> after the USA and China.
<b>Infrastructure Development</b>	The airport network has doubled from <b>74 in 2014 to 148 in April 2023</b> , enhancing accessibility.
<b>Regional Connectivity Scheme-UDAN</b>	<b>517 RCS routes connecting 76 airports</b> have facilitated air travel for <b>over 1.30 crore</b> people, promoting accessibility.

<b>Passenger Growth</b>	<b>Post-Covid resurgence:</b> Domestic airlines saw over 29% increase, and international airlines over 39% increase in passengers from Jan to Sep 2023 compared to 2022.
<b>Carbon Neutrality</b>	MoCA initiatives aim for carbon neutrality and net zero emissions at airports, with several airports already achieving <b>carbon neutrality and operating on green energy</b> .
<b>Future Projections</b>	India expects to handle over <b>140 million passengers in FY2024</b> and over <b>1.3 billion</b> annually in the next 20 years. Currently, there are 148 airports in India.

**Factors propelling India’s aviation market:**

- Rising incomes & middle-class expansion:** Rapid urbanization and a burgeoning middle class led by economic growth have made air travel affordable and essential for more Indians.
  - E.g. Number of middle-class households **doubled to 29.5 million between 2001-2011**.
- Increasing business travel demand:** A growing economy and the rise of major industrial hubs have resulted in a greater number of people travelling to tier 1 cities and metros for work.
  - E.g. **Bangalore saw a 12% rise in business-man travellers** in 2022 along with an IT sector boom.
- Tourism sector prioritization and incentives:** The government’s UDAN scheme offers viability gap funding for operationalizing underserved air routes, supporting regional tourism growth.
  - E.g. The number of operational airports rose from **74 in 2014 to 140 in 2021**.
- Emergence of low-cost carriers:** Airlines like Indigo, and SpiceJet have helped drive down carrier costs by up to 50%, enabling even lower and middle-income groups to access air transport.
  - E.g. Indigo accounted for 57% domestic market share as of 2022.
- Policy reforms and foreign investments:** 100% FDI allowance, lower jet fuel taxes, and digitization of processes have made the sector more attractive for foreign players to offer services.
  - E.g. **Air India was acquired by Tatas, a Vis-tara joint venture**
  - Reduction of GST rate to 5% from 18%** for domestic Maintenance, Repair and Overhaul (MRO) services

**Challenges faced by the aviation sector in India:**

- High Fuel Costs:** Aviation Turbine fuel constitutes around 40% of airlines’ operating costs. With one of the highest fuel taxation regimes, costs remain dis-

proportionately high.

- E.g. ATF prices rose by 120% between June 2021-22 alone.
- High operating costs:** High taxes on aviation turbine fuel (ATF) and airport charges contribute to increased operating costs.
    - Some Indian states **charge up to 30% taxes on jet fuel**, which makes shorter flight routes unprofitable for smaller airlines.
  - Infrastructure Constraints:** Severe shortage of airport slots and hangars at key airports like Mumbai and Delhi causes bottlenecks. Also results in heavy delays and congestion.
    - E.g. **Mumbai allows only 32 flights at peak time** against demand for 48 flights.
  - Financial Stress:** Multiple carriers like **SpiceJet, GoAir and Air India** struggled with heavy losses in recent years. High ATF Prices, and cut-throat competition has had a detrimental impact. E.g. – **Jet Airways**.
  - Regional Imbalance:** In spite of UDAN scheme efforts, air connectivity remains constrained across remote regions in **North East, and Central India** with several operational challenges.
    - E.g. Just 16% of all routes operational under the UDAN scheme are reportedly profitable so far
  - Safety & Regulatory Issues:** The rapid rise in passenger volume has made it difficult for the DGCA regulatory body to ramp up effective safety monitoring with limited staff strength.
    - E.g.: DGCA currently has just **132 flight operation inspectors** against sanctioned strength of 172 technical officers.

**Government Initiatives:**

- [UDAN Scheme](#) (Ude Desh ka Aam Nagrik)
- [National Civil Aviation Policy, 2016](#)
- [Open Sky Agreement](#)
- [Digi Yatra for Seamless Travel](#)

**UDAN 5.0**

**Context:** The Ministry of Civil Aviation in India has launched the 5th round of the Regional Connectivity Scheme (RCS) - Ude Desh Ka Aam Nagrik (UDAN)

**About UDAN Scheme**  
It was launched as a Regional Connectivity Scheme (RCS) under the Ministry of Civil Aviation in 2016, to provide affordable, economically viable and profitable air travel on regional routes to the common man even in small towns.

	UDAN 1.0	UDAN 2.0	UDAN 3.0	UDAN 4.0	UDAN 5.0
Focus Category	Category 1 (19-78 Seats)	1 (19-78 Seats)	1 (19-78 Seats)	1 (19-78 Seats)	2 (20-80 Seats) and 3 (>80 Seats)
Distance Length Cap	500 km	500 km	800 km	1,200 km	Now no restriction on the distance between the origin and destination of the flight
Viability Gap Funding Cap	70% for Cat-1, 90% for Hilly States, J&K, Ladakh, NE and Island regions	Same	Same	Same	60% for Priority Areas, 20% for Non-Priority Areas
Number of Airports	70 airports	325 airports	688 airports	766 airports	766 airports
Exclusivity	3 years	3 years	3 years	1 year	1 year
Implementation Period	10 years	10 years	10 years	10 years	10 years

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### Way forward:

1. **Rationalize ATF pricing and taxes:** Bring ATF under the GST ambit to ensure input tax credit benefits, rationalize excise duties to 8-10% against 11% currently as the jet fuel burden is disproportionately high.
2. **Augment airport infrastructure:** Fast-track investments via PPP models in new airports and existing airport modernization.
  - a. Initiatives of state governments like Haryana, Telangana, UP.
3. **Aviation Tourism Packages:** To make India a hub of Aviation tourism, our aviation industry can collaborate with the tourism industry to create innovative aviation-based tourism packages, offering scenic flights, adventure experiences, and aerial photography tours.
4. **Strategic policy support for fiscal consolidation:** Facilitate long-term capital investments for **fleet expansion, and MRO infrastructure.**
  - a. Fiscal incentives for regional connectivity provided viability gap funding.
5. **Robust safety oversight:** Boost investments for automated, real-time digital surveillance systems across airports. **Use AI-based** tools for predictive risk assessment. The Independent Airport Authority concept can raise monitoring capabilities.
6. **Customized regional connectivity support:** Continue viability gap funding for regional flights but also incentivize leasing smaller capacity planes (less than 80 seater) at concessional rates for **tier 2/3 city operations** through dedicated financing schemes.

### Conclusion

Aviation is integral to equitable economic growth, so India needs to focus on the growth of this sector to achieve equitable growth.

### Insta Links:

- [Civil Aviation in India](#)

### Mains Link:

**Q. Examine the development of Airports in India through joint ventures under Public-Private Partnership (PPP) model. What are the challenges faced by the authorities in this regard? (UPSC 2017)**

## 5. GREEN BIOHYDROGEN PRODUCTION IN INDIA

### Context:

The Principal Scientific Adviser to the Government of India, Professor Ajay Kumar Sood, chaired a meeting to discuss biomass cultivation on degraded land for green biohydrogen production.

**The key difference between biohydrogen and green hydrogen is in their sources of production:**

- **Biohydrogen:** Derived from biological sources

such as biogas, and often considered a form of renewable hydrogen due to its environmentally friendly conversion process.

- Biohydrogen is hydrogen produced from **biological sources, typically through biogas reforming.** It converts **biogas (CH<sub>4</sub> and CO<sub>2</sub>) into hydrogen**, often referred to as syngas or bio-hydrogen
- **Green Hydrogen:** Produced through the electrolysis of water using renewable energy sources like solar or wind power, and is considered the purest form of clean hydrogen.

### What is Green Bio-hydrogen?

Green biohydrogen refers to **hydrogen gas produced through the process of biomass cultivation**, typically on degraded or barren land. This method involves utilizing organic materials such as **seaweed, algae, molasses, sugarcane, and other plant-based resources** to generate hydrogen through biological processes.

For: [Opportunities and Challenges of Green Hydrogen in India: Click Here](#)

### Prospects of Biomass:

**A recent MNRE study estimated a surplus biomass availability** of approximately 230 million metric tonnes annually (2017-18) and a biomass power potential of **around 28 GW.** India's **tropical climate and vast agricultural potential** make it conducive for biomass production. With an annual production of about **460 million tonnes of agricultural waste**, biomass can **substitute coal by around 260 million tonnes**, potentially saving Rs 250 billion per year.

### Benefits of Bioenergy crops cultivation:

1. **Soil Restoration and Erosion Prevention:** Cultivation of energy crops rebuilds degraded soil, enhancing quality, fertility, and structure. Prevents soil erosion and fosters native plant species' habitat. Improves biodiversity and acts as a carbon sinks, combating climate change.
2. **Carbon Sequestration:** Biomass plants absorb carbon dioxide, aiding climate change mitigation.
3. **Sustainable Biohydrogen Production:** Biomass serves as feedstock for green biohydrogen production via thermochemical or biochemical conversion. Green biohydrogen is a clean fuel emitting only water vapour.
4. **Bioenergy Generation:** Specific bioenergy crops grown on degraded land are used for biomass energy production. Fast-growing trees, grasses, and high-energy plants can be converted into biofuels, biogas, or solid biomass.
5. **Enhancing Food Security:** Biomass cultivation on degraded land preserves fertile agricultural areas for

food crops. Prevents diversion of food grains, improving food security and supporting agri-export.

**Government Initiatives for Bio and Green Hydrogen:**

Initiative	Key Points
<a href="#">Global Biofuel Alliance</a>	Leading efforts to establish global standards for hydrogen from biomass.
<b>National Hydrogen Mission</b>	Targeting a production increase to 5 million metric tonnes (MMT) by 2030, meeting 40% of domestic requirements.
<b>Production Linked Incentive (PLI) Scheme</b>	Proposing a Rs 15,000-crore PLI scheme for electrolyzers.
<a href="#">Green Hydrogen Mission</a>	Development of Green Hydrogen Production Capacity of at least 5 MMT (Million Metric Tonne) per annum; Renewable energy capacity addition of about 125 GW in the country by 2030
	<b>Strategic Interventions for Green Hydrogen Transition (SIGHT):</b> Funding domestic electrolyser manufacturing and green hydrogen production.
	<b>Green Hydrogen Hubs:</b> Identifying and developing states/regions for large-scale hydrogen production/utilization.
	<b>Strategic Hydrogen Innovation Partnership (SHIP):</b> Under this Public-private partnership framework R&D will be facilitated under the mission.
<b>International Collaboration</b>	Actively partnering with other countries, research institutions, and private entities for expertise and technology development.
<b>Renewable Energy Integration</b>	Integrating green hydrogen production with India’s expanding renewable energy capacity for improved efficiency and sustainability.
<b>National Biomass Atlas of India</b>	It offers <b>state-wise and crop-wise data on residues per crop</b> , along with images illustrating different crops and their residue ratios.

**Challenges:**

1. **Soil Quality:** Rehabilitating degraded soil lacking essential nutrients is crucial.
2. **Species Selection:** Identifying biomass crops resilient to harsh conditions is challenging.
3. **Water Availability:** Developing efficient irrigation methods is essential due to water scarcity.
4. **Economic Viability:** High initial investments and aligning crops with market demand pose challenges.
5. **Biodiversity:** Introducing biomass crops may disrupt local ecosystems and biodiversity.
6. **Cultivation Methods:** Implementing practices to minimize ecological impact is essential.

**Way forward:**

To improve **degraded soil fertility**, strategies like **incorporating organic matter** such as compost and biochar, or employing techniques like **bio flocculation**, which leverages microbial processes, can be implemented. Additionally, by **adopting agro-forestry methods**, integrating fast-growing tree species like **Pongamia pinnata** with native grasses and legumes, not only enhances soil fertility through nitrogen fixation but also facilitates biofuel production while promoting biodiversity. **Drones equipped with multispectral sensors** can be utilized for quick assessment of degraded land, mapping soil composition, and identifying potential biomass cultivation areas, aiding in land diagnostics. Furthermore, **developing markets for biomass and its by-products** is essential for ensuring economic viability and creating a value chain that supports rural livelihoods. Additionally, **seaweed cultivation** holds immense potential for bioenergy production and fostering a marine biomanufacturing start-up ecosystem.

**Conclusion**

Bio-hydrogen will be a critical industrial fuel of the 21st century. India is well-positioned to show leadership, which is in India’s and the planet’s collective interest.

**Insta Links:**

[India’s green hydrogen challenge](#)

**Prelims Links:**

**Q. With reference to the usefulness of the by-products of the sugar industry, which of the following statements is/are correct? (UPSC 2013)**

1. Bagasse can be used as biomass fuel for the generation of energy.

2. Molasses can be used as one of the feedstocks for the production of synthetic chemical fertilizers.  
 3. Molasses can be used for the production of ethanol.  
**Select the correct answer using the codes given below:**  
 (a) 1 only  
 (b) 2 and 3 only  
 (c) 1 and 3 only  
 (d) 1, 2 and 3  
**Ans: C**

Topics: Science and Technology- developments and their applications and effects in everyday life Achievements of Indians in science & technology; indigenization of technology and developing new technology.

## 6. TECHNOLOGY CHALLENGES IN INDIA

**Context:**

C. Raja Mohan, in this [editorial](#), highlights the urgent need for India’s next government to address technology challenges beyond election manifestos.

**Global Status of Technology:**

- **Over 5 billion people** using the internet worldwide as of April 2024
- Major economies like **China, the United States, and Europe are prioritizing advanced technologies** to shape their future esp in AI, Machine Learning, Quantum Computing, Space sector, Nuclear technologies etc.

**India’s Status of Technology:**

- India’s technology industry is expected to reach **USD 300-350 billion in revenue in 5 years.**
- India has the **second largest telecom industry** with over 1 billion subscribers.
- India is the **second largest manufacturer** of mobile handsets.
- India is the **Third largest startup ecosystem** with over 1 lakh startups and 110 unicorns.
- **India’s AI adoption** outpaces global trends with **70 per cent adoption**, while Japan lags significantly at 24 per cent (as per a recent study)

**Subsectors of India’s Technology drivers:**

Key Sub Sectors	Description
IT and BPO Services	The largest component of India’s service exports, <b>comprising over 60%</b>
E-Commerce	Expected to <b>reach USD 1 trillion by 2030</b> due to factors like a large consumer base and robust infrastructure
FinTech and Digital Finance	Expected to grow to USD 150 billion by 2025.
Edtech	<b>Second largest e-learning market</b> , expected to grow to USD 10 billion by 2025
Cleantech and Renewable Energy	<b>India ranks 4th globally</b> for total renewable power capacity additions
Space Sector	Contributes 2%-3% of the global space economy

**Challenges faced by India’s technology field:**

Challenges	Description
<b>Lack of Emphasis on Technology Policy</b>	Despite its critical importance, technology policy is not prominently featured in India’s policy discourse, hindering the country’s ability to address evolving global technological challenges.

<b>Global Technological Competition</b>	Major economies like <b>China and the US are aggressively competing to dominate advanced technology sectors</b> , intensifying global technological competition and putting pressure on countries to keep pace.
	<b>China’s ambition to master “new productive forces” underscores</b> its aim to surpass the US in advanced science and technology
	The US is striving to regain leadership in advanced technology sectors
	European leaders are advocating for bolstering <b>Europe’s “industrial and technological sovereignty”</b> to compete with global tech giants
<b>Digital Divide</b>	India’s digital divide, especially between <b>urban and rural areas, persists despite efforts like BharatNet</b> , hindering equitable access to Information and Communication Technology (ICT) and exacerbating inequality, particularly in terms of internet and computer access.
<b>Lack of Relevant Skilling</b>	While India excels in IT services, <b>there’s a shortage of skilled professionals in emerging areas like AI, cybersecurity, and data science</b> , reflecting the need for educational reforms to bridge the skill gap and meet evolving industry demands.
<b>Lack of Adequate Focus on R&amp;D</b>	India’s <b>relatively low investment in research and development compared</b> to developed nations inhibits innovation and the domestic production of cutting-edge technologies
<b>Cybersecurity Threats</b>	With increasing technology adoption, cybersecurity threats like <b>cyber frauds and deep fakes are escalating</b>
<b>Lack of Comprehensive Regulation on AI</b>	<b>India’s absence of a comprehensive law for regulating AI</b> raises uncertainties for businesses and poses risks in AI adoption, emphasizing the need for clear and legally binding regulations to address

**Government Initiatives:**

1. **India’s Semiconductor Mission:** Launched in 2021, aims to develop sustainable semiconductor and display ecosystems.
2. **IndiaAI Mission:** With over Rs 10,300 crore allocation, fosters AI leadership, ethical deployment, and democratizing AI benefits.
3. **DigiLocker:** A free, secure platform for storing, sharing, and verifying documents online.
4. **Unified Payment Interface (UPI):** Enables instant money transfer between bank accounts via smartphones.
5. **Mission on Advanced and High-Impact Research (MAHIR):** Launched in 2023, focuses on accelerating research in the power sector.
6. **PLI Schemes** (Production Linked Incentive): Introduced for sectors like semiconductors and electronics manufacturing.
7. **National Supercomputing Mission:** Aims to boost the country’s computing power, jointly steered by DST and MeitY, and implemented by C-DAC and IISc.
8. **Vigyan Jyoti:** This program from the Department of Science & Technology (DST) encourages girls in high school and up to PhD level to pursue STEM careers.
9. **GATI:** A program that promotes female education in STEM fields
10. **CURIE:** A program that promotes female education in STEM fields

**Way forward:**

1. **Emphasis on Tech Policy:** Prioritize reforms integrating technology policies into the national agenda.
2. **Increased R&D Spending:** Significantly boost national spending on research and development.
3. **Private Sector Participation:** Encourage private sector involvement in tech research, development, and production.
4. **Technology Department Overhaul:** Revamp technology departments to align with a tech-driven economy.
5. **Modernize Tech Foundation:** Update tech infrastructure to meet the demands of a tech-driven economy.
6. **Strategic Partnerships:** Forge partnerships with countries like the US and Europe for tech transfer and collaboration.
  - a. **E.g., Quantum Leap Alliances:** Forge alliances for quantum technology research and development.
7. **AI-powered Rural Hubs:** Establish AI kiosks to support rural entrepreneurship.
8. **Moonshot Innovation Labs:** Create high-risk, high-reward research labs for breakthrough technologies.
9. **TechnoSkilling Initiatives:** Foster collaborations to design tech-aligned curricula and promote skill mobility.
10. **Enhanced Cybersecurity:** Implement robust cyber resilience frameworks and promote secure-by-design principles.

**Insta Link:**

- [A renewed focus on emerging technologies](#)
- [Technology and Innovation Report 2023](#)

**Mains Link:**

**Q.** The COVID-19 pandemic has caused unprecedented devastation worldwide. However, technological advancements are being availed readily to win over the crisis. Give an account of how technology was sought to aid the management of the pandemic. (UPSC 2020)

**Prelims Link:**

**Q.** With the present state of development, Artificial Intelligence can effectively do which of the following? (UPSC 2020)

1. Bring down electricity consumption in industrial units
2. Create meaningful short stories and songs
3. Disease diagnosis
4. Text-to-Speech Conversion
5. Wireless transmission of electrical energy

Select the correct answer using the code given below:

- (A) 1, 2, 3 and 5 only
- (B) 1, 3 and 4 only
- (C) 2, 4 and 5 only
- (D) 1, 2, 3, 4 and 5

Ans: B

**Q.** With reference to “Blockchain Technology”, consider the following statements: (UPSC 2020)

1. It is a public ledger that everyone can inspect, but which no single user controls.
2. The structure and design of blockchain is such that all the data in it are about cryptocurrency only.
3. Applications that depend on basic features of blockchain can be developed without anybody’s permission.

Which of the statements given above is/are correct?

- (A) 1 only
- (B) 1 and 2 only
- (C) 2 only
- (D) 1 and 3 only

Ans: D

## 7. USE OF AI FOR DRUG DISCOVERY AND DEVELOPMENT

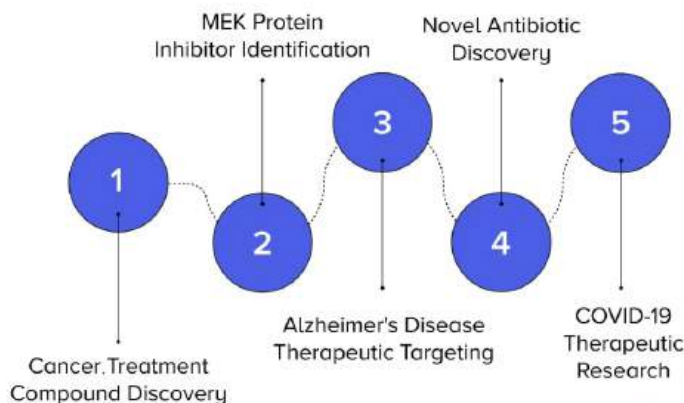
**Context:**

AI is **transforming drug development by accelerating target discovery** and predicting drug-target interactions.

**Examples of New Drugs Formulated through AI:**

1. **DSP-1181:** For obsessive-compulsive disorder.
2. **Halicin:** For antibiotic resistance
3. **BMS-986195:** A potential treatment for fibrosis.

### How AI is Already Making an Impact on Healthcare



**Role of AI in Drug Development and Discovery:**

Aspect	Role
<b>Enhanced Target Discovery</b>	AI, particularly through advanced tools like <b>AlphaFold and RoseTTAFold</b> , revolutionizes target discovery by accurately predicting the three-dimensional structures of proteins, DNA, and RNA. It allows for a <b>more precise understanding of how drugs</b> can interact with these biological targets.
<b>Improved Efficiency</b>	AI models <b>drastically reduce the time required for drug-target interaction studies</b> and increase the accuracy of these predictions. E.g., AlphaFold 3 predicted drug-target interactions with a <b>76% accuracy rate</b> , a substantial improvement over previous methods.
<b>Cost Reduction</b>	By leveraging <b>deep neural networks and generative diffusion</b> -based architectures, AI minimizes the need for expensive and time-consuming laboratory experiments, thus reducing drug development costs.
<b>Versatility in Predictions</b>	Predict interactions involving any combination of protein, DNA, RNA, small molecules, and ions, broadening the scope of drug development research.
<b>Improved Drug Design</b>	AI algorithms predict how a molecule will interact with a target protein, allowing for more targeted drug design with better efficacy and fewer side effects.

**Limitations of AI in Drug Development**

1. **Limited Prediction Accuracy:** AI tools achieve up to 80% accuracy, but drop significantly for complex interactions like protein-RNA.
2. **Restricted Application:** AI enhances early phases like target discovery but doesn't affect pre-clinical and clinical trials.
3. **Model Hallucinations:** Diffusion-based AI models

can generate incorrect predictions due to inadequate training data.

4. **Restricted Tool Access:** Advanced tools like AlphaFold 3 are not publicly available, limiting verification and broader use.
5. **Lack of Computing Infrastructure:** India lacks extensive computing resources like high-speed GPUs, hindering AI-driven drug development.
6. **Shortage of Skilled Professionals:** There's a significant gap in skilled AI scientists compared to countries like the U.S. and China, limiting innovation within India.
7. **Data Quality and Quantity:** The diverse and often scarce nature of drug discovery data poses challenges for accurate analysis and modelling by AI systems.
8. **Cost and Technical Expertise:** Implementing AI in drug discovery requires substantial investments in infrastructure and skilled personnel
9. **Lack of Standardization:** The absence of standardized data formats, collection methods, and analysis techniques in drug discovery hinders the effective comparison of studies and datasets

**What should be done:**

1. **Data Privacy and Regulatory Compliance:** Strict adherence to data protection regulations like HIPAA and GDPR is essential in AI-driven drug discovery to address ethical and legal concerns regarding patient data privacy.
2. **Investment in R&D:** India can boost AI-driven research projects in pharmaceuticals by increasing funding and support. Public-private partnerships can expedite innovation and commercialization.
3. **Regulatory Framework:** Establishing supportive regulations balancing innovation and safety is crucial. Investment in infrastructure like high-performance computing facilities is necessary for AI-driven research.
4. **Public-Private Partnerships:** Collaboration among academia, government, and pharmaceutical firms accelerates AI adoption in the industry.

**Case Study:**

**iOncology AI Project:** To develop an AI-powered platform (iOncology AI) to help oncologists select the most effective treatment for cancer patients based on their genetic make-up.

**The government programme for the promotion of AI in Healthcare:**

- Ayushman Bharat Digital India Mission
- IndiGen Programme (for genome sequencing of Indians)
- Human Genome Project
- Health Stack
- **ICMR guideline of use of AI in Healthcare**

- AIRAWAT (AI Research, Analytics and Knowledge Assimilation platform): India's first AI-specific cloud computing infrastructure

**Conclusion:**

The AI market has witnessed significant growth, from \$200 million in 2015 to \$700 million in 2018, with projections indicating a surge to \$5 billion by 2024. The integration of AI in drug discovery has the potential to **revolutionize the pharmaceutical industry** and healthcare sector in India and further support India's position as the **'Pharmacy of the World'**.

**Insta Links:**

[Use of Artificial Intelligence in Medicine](#)

**Prelims Links**

**Q. With reference to agriculture in India, how can the technique of 'genome sequencing', often seen in the news, be used in the immediate future?**

1. Genome sequencing can be used to identify genetic markers for disease resistance and drought tolerance in various crop plants.
2. This technique helps in reducing the time required to develop new varieties of crop plants.
3. It can be used to decipher the host-pathogen relationships in crops

**Select the correct answer using the code given below:**

- (a) 1 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

**Answer: D**

Topics: Conservation related issues, environmental pollution and degradation, environmental impact assessment.

**8. INDIA'S FORESTS IN PERIL: DELAYS AND DATA GAPS**

**Context:**

In compliance with a **Supreme Court order (in Feb 2024)**, the Ministry of Environment, Forests and Climate Change (MoEFCC) uploaded the various **State Expert Committee (SEC) reports** on the **status of unclassified forests**.

- The SC order was in response to a PIL **challenging the constitutionality of the Forest (Conservation) Act Amendment (FCAA) 2023**.

**What are Unclassed forests (also called 'Deemed Forests')?**

Unclassed forests are **areas of land that exhibit forest-like characteristics** but have **not been officially classified or designated** as forests by authorities. Despite lacking formal recognition, these areas often **possess vegetation and ecosystem features** typical of forests. They may be owned by various entities, including government bodies, communities, or private individuals. Varying state definitions of forests re-

sult in **estimates of deemed forests ranging from 1% to 28% of India’s official forest area.**

Despite their unclassified status, **these forests were afforded legal protection under the SC order (in Godavarman case, 1996).** As per this landmark case and the subsequent Forest (Conservation) Act of 1980, **all types of forests, regardless of ownership or notification status, were to be included under forest conservation laws.**

### Why were SECs formed?

In pursuance of the SC order in the [Godavarman case](#), State Expert Committees were formed to **identify and assess unclassified forests** across the country. However, a **significant delay of 27 years in submitting these reports** left the status of unclassified forests ambiguous.

### Status of SECs Report:

Despite the SC order, **seven states and UTs, including Goa and Tamil Nadu, did not establish SECs.** Many states relied on existing data or quoted figures from the Forest Survey of India (FSI), raising doubts about accuracy. For instance, **Gujarat’s SEC report conflicts with FSI data**, highlighting inconsistencies. Almost, no states/UTs have provided geographical Indication (GI) for the deemed forest.

### What did FCAA do with respect to ‘Unclassed Forest’?

The Forest (Conservation) Act Amendment (FCAA) 2023 stipulates those certain types of land, including **those notified as forest under the Indian Forest Act, 1927** or in government records post the **Forest (Conservation) Act 1980**, require Central Government permission for various activities like **dereservation, non-forest use, or leasing to private entities.**

However, the FCAA excludes land recorded as forest before October 25, 1980, and land converted from forest-use to non-forest-use before December 12, 1996, from its purview. This exclusion may contradict the 1996 SC Godavarman judgment on preventing deforestation, **potentially exposing unclassified forests to diversion without protection.**

### Way forward:

**To resolve the issue of unclassified forests in India, the following steps can be taken:**

1. **SC direction (in its interim order of Feb 2024):**
  - a. **States and UTs must adhere to the definition of forests** outlined in the Godavarman Judgement until comprehensive records on forest land are prepared.
  - b. **The Centre must submit a comprehensive record of land identified as ‘forest’ by expert committees** within two weeks, as per the guidelines of the TN Godavarman judgement.
  - c. **Final approval for the establishment of zoos/safaris** requires permission from the Supreme Court.
2. **Comprehensive Survey:** Conduct a nationwide survey to identify and classify all unclassified forests,

utilizing modern technology and satellite imagery for accurate mapping.

3. **Formation of State Expert Committees (SECs):** Ensure that all states and Union Territories form SECs tasked with identifying unclassified forests and preparing detailed reports.
4. **Legal Protection:** Strengthen legal provisions to protect unclassified forests, ensuring that they receive the same level of protection as classified forests under relevant forest conservation laws.
5. **Community Engagement:** Involve local communities and indigenous peoples in the identification and conservation of unclassified forests, recognizing their traditional knowledge and rights.
6. **Public Awareness and Education:** Raise public awareness about the importance of unclassified forests for biodiversity conservation, climate change mitigation, and ecosystem services through education and outreach programs.

### About the Forest Conservation Act of 1980:

It **regulates deforestation, and forest product transportation, and imposes duties on timber.** It mandates prior Central Government approval for forest land diversion for non-forest purposes. The 1996 Godavarman judgment by the Supreme Court mandates forest protection, introducing deemed forests—areas resembling forests but not officially classified as such.

### Key Provisions of FRA Amendment 2023:

	Details
<b>About</b>	Forest (Conservation) Amendment Bill, 2023 allows for the diversion of forest land for various projects, including roads, railways, and strategic national security projects, within 100 km of India’s international borders. It amends the <a href="#">Forest (Conservation) Act, 1980</a> .
<b>Objective</b>	To clarify and enhance the Forest (Conservation) Act, 1980
<b>Scope</b>	Applicability to land designated as forest since 1980
<b>Insertion of Preamble</b>	The Act introduces a Preamble acknowledging India’s commitment to Net Zero Emission by 2070, meeting NDC targets by 2030, and expanding forest cover to one-third of the land.
<b>Land under the Purview</b>	The forest law applies to areas under the Forest Act, 1927, and designated after October 25, 1980. Not applicable to forests converted for non-forest use after December 12, 1996

<b>Exemptions</b>	Land within 100 km of borders for national security
	Forest land along a rail line or a public road maintained by the government
	Land up to 10 hectares, is proposed to be used for constructing security-related infrastructure, afforestation etc.
<b>Leasing of Forest Land</b>	State government requires prior approval of the central government to assign forest land to any entity not owned or controlled by the government
<b>Permitted Activities</b>	Permitted activities have been expanded to include check posts, fencing, bridges, zoos and safaris under the Wild Life (Protection) Act, 1972; eco-tourism facilities; and silvicultural operations (enhancing forest growth), etc.
	Restrictions on de-reservation or non-forest use lifted with central government approval
<b>Implementation</b>	The central government is empowered to issue “directions” to central government authorities, state governments, territories, or recognized entities for proper Act implementation.

**Status of Forests in India:**

**Definition of Forest:** 1996 Godavarman Judgement defines “forest” as any land recorded as such in government records or meeting the dictionary definition, which describes a forest as **“a large area covered with trees and undergrowth”** according to the Oxford Dictionary.

**As per, the India State of Forest Report 2021:**

- India’s forest and tree cover constitutes 24.62%** of its geographical area, with forests covering **21.71%** and tree cover **2.91%**.
- Madhya Pradesh has the largest forest cover** by area, followed by Arunachal Pradesh, Chhattisgarh, Odisha, and Maharashtra.
- Mizoram, Arunachal Pradesh, Meghalaya, Manipur, and Nagaland** have the highest forest cover as a percentage of the total geographical area.
- States like Andhra Pradesh, Telangana, Odisha, Karnataka, and Jharkhand** have shown a positive change in forest cover, while others like Arunachal Pradesh, Manipur, Nagaland, Mizoram, and Meghalaya have experienced a decline.
- India ranks third globally for net gain in average annual forest area** between 2010 and 2020, with more than half of the world’s forests located in Russia, Brazil, Canada, the United States, and China.

**Insta Links:**

- [Forest Conservation Amendment Act 2023: Impact on Indigenous Communities](#)

**Mains Links:**

Q. “The most significant achievement of modern law in India is the constitutionalization of environmental problems by the Supreme Court.” Discuss this statement with the help of relevant case laws. (UPSC 2022)  
 Q. “Policy contradictions among various competing sectors and stakeholders have resulted in inadequate ‘protection and prevention of degradation’ to the environment.” Comment with relevant illustrations. (UPSC 2018)

**Prelims Links:**

**Q. Consider the following statements: (UPSC 2019)**

- As per recent amendment to the Indian Forest Act, 1927, forest dwellers have the right to fell the bamboos grown on forest areas.
- As per the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, bamboo is a minor forest produce.
- The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 allows ownership of minor forest produce to forest dwellers.

Which of the statements given above is/are correct?  
 (a) 1 and 2 only  
 (b) 2 and 3 only  
 (c) 3 only  
 (d) 1, 2 and 3

**Ans: B**

**9. THE VITAL ROLE PLAYED BY TRIBAL COMMUNITIES IN PRESERVING FORESTS**

**Context:**

Droupadi Murmu (in this [article](#)) emphasized the vital role of preserving forests and advocated for listening to tribal communities, whose collective wisdom can guide ecological sustainability.

**About Scheduled Tribes in India:**

Aspects	Description
	The Constitution of India does not define the term ‘tribe’. <b>Article 342 (i)</b> empowers the President to specify Scheduled Tribes. <b>Fifth Schedule</b> establishes Tribes’ Advisory Councils. STs constitute <b>8.6%</b> of the Population (census 2011). <b>Draft National Tribal Policy, 2006</b> records <b>698 STs</b> in India. <b>Bhil</b> is the largest tribal group (38%) followed by Gonds. <b>Madhya Pradesh</b> has the highest tribal Population in India. Santhal are the oldest Tribes in India.

<b>According to Lokur Committee (1965):</b>	1. Indication of Primitive Traits
	2. Distinctive Culture
	3. Shyness of Contact with the Community at Large
	4. Geographical Isolation
	5. Backwardness
<b>Educational &amp; Cultural Safeguards</b>	<b>Article 15(4):</b> Special provisions for advancement of STs.
	<b>Article 29:</b> Protection of Interests of Minorities (includes STs).
	<b>Article 46:</b> Promotion of educational and economic interests.
	<b>Article 350:</b> Right to conserve distinct Language, Script or Culture.
<b>Political Safeguards</b>	<b>Article 330:</b> Reservation of seats for STs in Lok Sabha.
	<b>Article 332:</b> Reservation of seats for STs in State Legislatures
	<b>Article 243:</b> Reservation of seats in Panchayats.
<b>Administrative Safeguard</b>	<b>Article 275:</b> Grant of special funds for welfare and administration.

<b>Sustainable Fishing Practices</b>	<b>Wancho and Nocte tribes of Tirap district</b> , Arunachal Pradesh employ bamboo and stone obstructions for fishing.
<b>Wildlife Protection through Beliefs and Totems</b>	<b>Adi tribes of Arunachal Pradesh</b> do not hunt animals like tigers, sparrows, and pangolins due to cultural beliefs.
<b>Community-based Conservation Efforts</b>	Idu Mishmis declare forest areas as " <b>Community Conserved Areas</b> "; <b>Bishnoi Tiger Force</b> combats poaching in Rajasthan.

#### Key Challenges Encountered by Tribals in India:

- Land Alienation and Displacement:** Tribes face displacement due to development projects like mining and dams, disrupting their traditional lands.
- Lack of Implementation of Forest Rights Act:** Slow implementation of the Act has led to delays and harassment, with many facing illegal evictions.
- Threats to Traditional Livelihood Practices:** Conservation policies and restrictions have endangered traditional practices like shifting cultivation and hunting.
- Loss of Traditional Knowledge and Cultural Erosion:** Migration to urban areas risks the loss of traditional knowledge and cultural practices.
- Impact of Climate Change:** Tribes, reliant on natural resources, are vulnerable to climate change impacts, affecting agriculture and livelihoods.
- Lack of Education:** Inadequate infrastructure and language barriers hinder tribal education, leading to a preference for immediate employment over schooling.
- Health and Nutrition Issues:** Economic backwardness results in health problems and malnutrition among tribal populations.
- Gender Issues:** Environmental degradation and commercialization affect gender roles and create societal challenges.
- Erosion of Identity:** Modern institutions conflict with traditional tribal laws, leading to concerns about preserving cultural identity and language extinction.

#### Solutions for Tribal Forest Conservation:

- Listen to Tribal Communities:** Incorporate tribal wisdom for ecologically sustainable practices.
- Amend Curriculum:** Adapt forest service training to address climate change and conservation challenges.
- Learn and Propagate:** Engage with tribal communities, learn from their practices, and propagate their sustainable methods.
- Balance Tradition and Modernity:** Acknowledge and integrate traditional knowledge with modern conservation approaches.
- Participatory Forest Management:** Strengthening

#### Roles Tribal Population Play in Forest Conservation:

Roles	Examples
<b>Eco-tourism Initiatives</b>	Khonoma village in Nagaland, managed by the Angami tribe, <b>promotes community-based eco-tourism</b> while preserving forests and traditional practices.
<b>Tribal Forest Guardians Program</b>	Implementation of a " <b>Tribal Forest Guardians</b> " program, training tribal members as forest guards or eco-guides, leveraging their local ecological knowledge.
<b>Tribal Knowledge Banks</b>	<b>Documenting traditional ecological knowledge</b> , like the rice-fish cultivation system of <b>the Apatani tribe in Arunachal Pradesh</b> , and integrating it into conservation strategies.
<b>Forest Product Value Addition and Marketing</b>	Establishing <b>processing units for forest products</b> and creating market linkages, exemplified by the <b>Hakki Pikki tribe's Adiwasi Herbal Hair Oil</b> .
<b>Preservation of Sacred Groves</b>	<b>Garasia tribes in Sirohi district</b> , Rajasthan preserve forests as sacred groves, protecting threatened species.
<b>Rotational Farming and Grazing</b>	<b>Gond, Pradhan, and Baiga tribes</b> of Madhya Pradesh practice <b>Utera farming and Badi cropping system</b> .

participatory forest management models like Joint Forest Management (JFM) by ensuring tribal communities' active involvement in decision-making processes.

**Insta Links:**

- [Indigenous Knowledge – Konda Reddi tribe](#)
- [The 'Scheduled Tribes and Other Traditional Forest Dwellers \(Recognition of Rights Act\)'](#)

**Prelims Link:**

**Q.1 Consider the following pairs: (UPSC 2013)**

	Tribe	State
1.	Limboo (Limbu)	Sikkim
2.	Karbi	Himachal Pradesh
3.	Dongaria Kondh	Odisha
4.	Bonda	Tamil Nadu

**Which of the above pairs are correctly matched?**

- (a) 1 and 3 only
- (b) 2 and 4 only
- (c) 1, 3 and 4 only
- (d) 1, 2, 3 and 4

**Ans: A**

**Q.2 Consider the following statements about Particularly Vulnerable Tribal Groups (PVTGs) in India: (UPSC 2019)**

1. PVTGs reside in 18 States and one Union Territory.
2. A stagnant or declining population is one of the criteria for determining PVTG status.
3. There are 95 PVTGs officially notified in the country so far.
4. Irular and Konda Reddi tribes are included in the list of PVTGs.

**Which of the statements given above are correct?**

- (a) 1, 2 and 3
- (b) 2, 3 and 4
- (c) 1, 2 and 4
- (d) 1, 3 and 4

**Ans: C**

**Q. 3 Under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, who shall be the authority to initiate the process for determining the nature and extent of individual or community forest rights or both? (UPSC 2013)**

- (a) State Forest Department
- (b) District Collector/Deputy Commissioner
- (c) Tahsildar/Block Development Officer/Mandal Revenue Officer
- (d) Gram Sabha

**Ans: D**

**Q. At the national level, which ministry is the nodal agency to ensure effective implementation of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006?**

- (a) Ministry of Environment, Forest and Climate Change
- (b) Ministry of Panchayati Raj
- (c) Ministry of Rural Development
- (d) Ministry of Tribal Affairs

**Ans: D**

## 10. ECONOMIC COST OF CLIMATE CHANGE

**Context:**

The economic toll of climate change is staggering, with recent UN studies revealing that **global GDP could have been 37% higher** without warming since 1960.

**What is Climate Change?**

Climate change refers to **long-term alterations in temperatures and weather patterns**. While natural factors like **solar activity and volcanic eruptions** can contribute, human activities, especially the burning of fossil fuels, have been the primary driver since the 1800s. From 1970 to 2021, nearly 12,000 climate change-induced disasters occurred, causing over 2 million deaths and **\$4.3 trillion** in economic losses.

**India ranked 7th in the Global Climate Risk Index 2021**, indicating high exposure and vulnerability to climate risk events. Its diverse climate faces various temperatures, precipitation patterns, and extreme weather events, impacting the economy spatially and temporally.

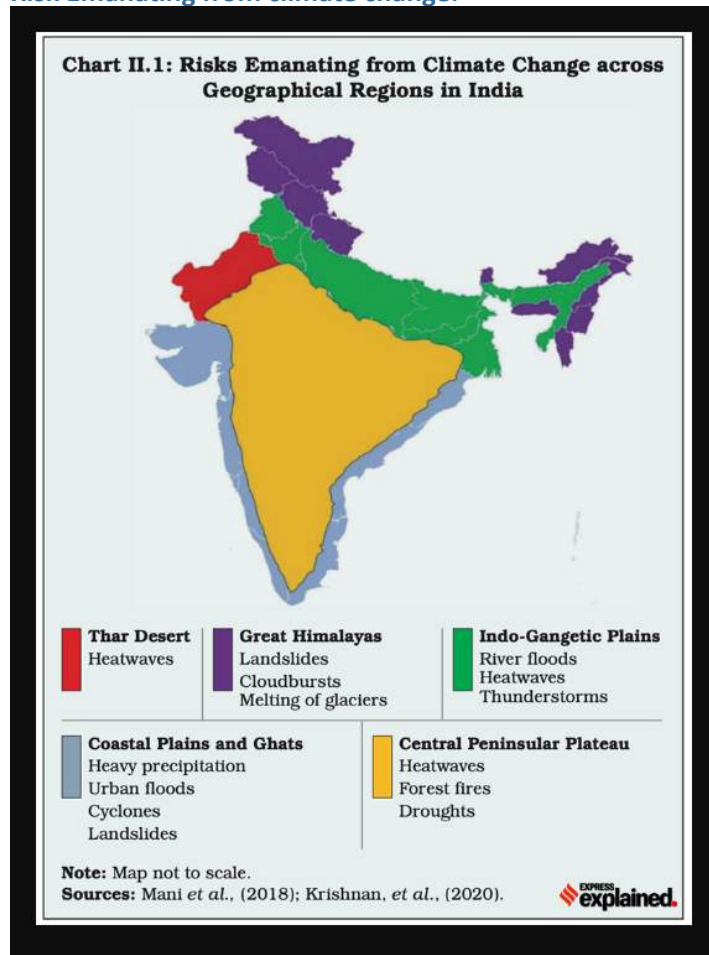
**Impact of Climate Change on the Economy:**

Impacts	Description
<b>Reduced Agricultural Productivity and Yield</b>	Climate change can <b>disrupt crop cycles and lower agricultural yield</b>  The <b>southwest monsoon has also become unpredictable</b> . The annual average rainfall in India has gradually declined while intense wet spells as well as dry spells have increased in India.
<b>Setback to Industrial and Service Sector</b>	Increased operational costs, reduced profits, and infrastructure damage can occur due to <b>climate-related regulations, investment shifts, and extreme weather events</b> , affecting industrial and service sectors.

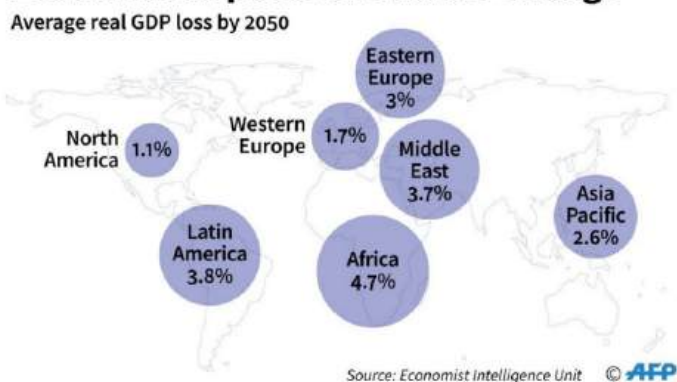
<b>Infrastructure Damage</b>	Extreme weather events like <b>floods and heatwaves</b> induced by climate change can cause significant damage to infrastructure, leading to economic losses.
<b>Labor Market Impacts</b>	Climate-induced <b>health hazards</b> may reduce productivity and prompt migration from climate-vulnerable areas; Global job losses from heat stress by 2030.  In 2020, the <b>World Bank said that India could account for 34 million of the projected 80 million global job losses</b> from heat stress-associated productivity decline by 2030.
<b>Risks for Banks and Financial Institutions</b>	Physical and transition risks from climate change can affect banks and financial institutions directly and indirectly, impacting their credit, market, liquidity, operational, and reputational risks.
<b>Impacts on High-Emission Industries</b>	Industries contributing to <b>high greenhouse gas emissions face challenges in transitioning to cleaner technologies</b> , affecting electricity production, transportation, and other sectors.
<b>Resource Scarcity</b>	Climate <b>change worsens water scarcity</b> , leading to conflicts over shared water resources, and impacting agriculture, hydropower, and economic activities.
<b>Erupted Arctic Economic Opportunities</b>	Melting Arctic sea ice opens economic opportunities but also raises <b>concerns over resource exploitation and territorial disputes</b> among nations with interests in the region.
<b>Climate-induced Conflicts</b>	Climate change exacerbates <b>existing tensions and conflicts over resources</b> , particularly in regions facing political instability and economic challenges, such as the Syrian conflict influenced by prolonged drought.
<b>Climate-related Supply Chain Disruptions</b>	Extreme weather events disrupt global supply chains, causing <b>economic losses and shortages of critical goods</b> , exemplified by the 2011 floods in Thailand impacting electronics and automotive manufacturing.

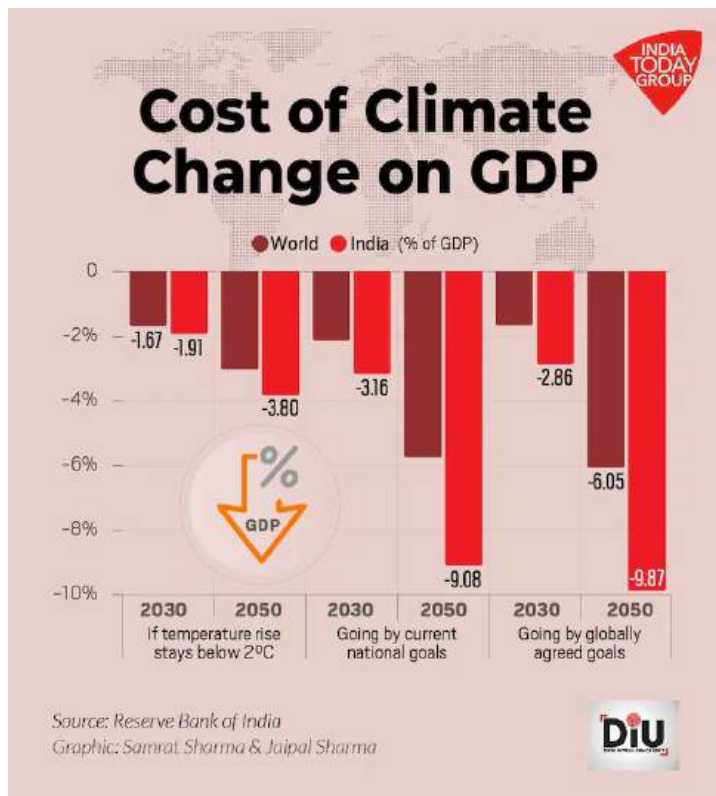
<b>Climate Gentrification</b>	Climate change susceptibility prompts <b>wealthier individuals and businesses to relocate</b> , potentially leading to economic displacement and further marginalization of vulnerable communities in safer areas.
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**Risk Emanating from climate change:**



**Economic impacts of climate change**





**What should be done:**

- Industrial Symbiosis:** Revolutionize circular economy, incentivize waste reduction, and promote industrial symbiosis.
- Public-Private Partnerships:** Encourage collaborations for green innovation, and establish dedicated funds for startups.
- Climate-Conscious Urban Planning:** Prioritize sustainability in city planning, and integrate climate measures into Smart Cities Mission.
- Climate-Resilient Special Economic Zones (SEZs):** Create zones with sustainable practices, and attract green businesses and industries.
- National Green Taxonomy:** Establish a classification system for sustainable activities, and guide investments and policies.
- Green Bond Financing:** Issue sovereign green bonds to fund climate-resilient infrastructure projects.

**Conclusion:**

India, the third-largest emitter of greenhouse gases in 2020, is projected to peak emissions between 2040-2045, posing challenges for its energy transition plans. A forward-thinking approach is crucial for navigating this trajectory effectively.

**Mains Link:**

Q.1 Describe the major outcomes of the 26th session of the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC). What are the commitments made by India in this conference? (UPSC 2021)

Q.2 'Climate Change' is a global problem. How will India be affected by climate change? How Himalayan and coastal states of India be affected by climate change? (USPC 2017)

**Prelims Link**

**Q.1 In the context of India's preparation for Climate-Smart Agriculture, consider the following statements: (UPSC 2021)**

- The 'Climate-Smart Village' approach in India is a part of a project led by the Climate Change, Agriculture and Food Security (CCAFS), an international research programme.
- The project of CCAFS is carried out under Consultative Group on International Agricultural Research (CGIAR) headquartered in France.
- The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in India is one of the CGIAR's research centres.

Which of the statements given above are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

**Ans: (d)**

**Q.2 Which of the following best describes/describe the aim of 'Green India Mission' of the Government of India? (UPSC 2016)**

- Incorporating environmental benefits and costs into the Union and State Budgets thereby implementing the 'green accounting'.
- Launching the second green revolution to enhance agricultural output so as to ensure food security to one and all in the future.
- Restoring and enhancing forest cover and responding to climate change by a combination of adaptation and mitigation measures.

Select the correct answer using the code given below.

- (a) 1 only
- (b) 2 and 3 only
- (c) 3 only
- (d) 1, 2 and 3

**Ans: (c)**

**Q.3 With reference to 'Global Climate Change Alliance', which of the following statements is/are correct? (USPC 2017)**

- It is an initiative of the European Union.
- It provides technical and financial support to targeted developing countries to integrate climate change into their development policies and budgets.
- It is coordinated by World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD).

Select the correct answer using the code given below:

- (a) 1 and 2 only
- (b) 3 only

(c) 2 and 3 only  
(d) 1, 2 and 3  
Ans: (a)

Topics: Disaster and management.

## 11. STATE OF FIRE SAFETY STANDARDS IN INDIA

### Context:

Recent tragedies at a children’s hospital in Delhi and a gaming zone in Rajkot, claiming 34 lives, have underscored the state of safety standards in India.

In the Delhi hospital fire, **seven newborns died**, and concerns were raised about illegal cylinder refilling. The **Rajkot gaming zone fire**, which killed 27, was due to an electrical short circuit.

### Status of Fire Accidents in India:

1. In 2022, In India, **7,435 people were killed in over 7,500 fire accidents** (NCRB report 2022).
2. **Maharashtra and Gujarat**, our two most highly urbanised states, account for about 30% of the country’s fire accident deaths.
3. **The India Risk Surveys 2018** has placed **India in 3rd position in fire incidents**. This signifies the grave risks of fire incidents to urban habitats.

### Challenges in preventing fire outbreaks:

1. **Absence of uniform safety legislation:** Fire services are managed by states, leading to inconsistencies in safety standards due to resource constraints at the municipal level.
2. **National Building Code of India, 2016:** While it includes provisions for ‘**Fire and Life Safety**’ audits, these are only **recommendatory**, not mandatory.
3. **Inadequate Fire Services:** There is a significant shortfall in the number of fire stations and personnel compared to what is required, as revealed by the Central Government’s reply in Parliament in 2019.
4. **Poor Compliance:** Examples include a hospital in Delhi operating with an inadequate and expired license, lacking fire extinguishers and emergency doors, and an indoor gaming centre in Rajkot lacking a no-objection certificate and conducting welding work during business hours.
5. **Suboptimal government oversight:** Weak inspections and rare follow-up actions after major disasters indicate critical shortcomings in oversight and regulatory enforcement.

### Causes for increased vulnerability of Urban areas to Fire Hazards:

1. **Rapid and unplanned urbanisation** is becoming predominant, especially in Asia and Africa. This, in turn,

increases the **vulnerabilities to multiple hazards** including a fire in especially urban agglomerations such as Mumbai, Delhi, Bengaluru, etc.

2. **The high density of settlements** resulted in narrow and constricted circulation spaces.
3. **Limited access to structures** by firefighting equipment because of flouting of planning regulations; Narrow lanes that **hinder quick response** to fires.
4. Settlements are made up of **flammable materials**; a small fire can **become a conflagration** quickly.
5. **High use of electrical equipment and machinery, faulty electric connections and gadget failures**; Un-safe electric practices by residents.
  - a. Past incidents show that most fire accidents take place majorly due to **electrical short circuits and gas cylinder/stove bursts, human negligence, and ill-formed habits**.

### Notable incidents:

- **Uphaar cinema blaze** in Delhi that killed 59 people in 1997.
- **Kumbakonam school fire** in Tamil Nadu in 2004 in which 94 children died.
- **The Mumbai Kamala Mills fire** in 2017 killed 14 people and injured many.
- Fire in a **Surat coaching centre** in 2019 resulted in the death of more than 20 young people.
- **Ahmednagar Hospital fire tragedy** where 11 COVID-19 patients lost their lives.

### Aspect of fire safety standards in India:

Aspect	Details
Fire Service Authority	State subject and included in the <b>XII schedule of the Constitution</b>
Establishment of Fire Services	Many states have established <b>Fire &amp; Emergency Services through statutory Acts</b>
Legislation Basis	Acts based on the <b>Model Fire Service Bill</b> circulated by the Ministry of Home Affairs
Responsibility at the Local Level	<b>Municipal corporations and local bodies</b> in some states are responsible for fire services
Fire Safety Norms	<b>National Building Code -2016</b> serves as the basis for fire safety norms in India
Central Level Mechanisms	Director-General of Civil Defense, Home Guards, & Fire Services under the Ministry of Home Affairs oversees fire management. Assisted by the Fire Adviser for deliberations. Standing Fire Advisory Committee provides inputs for improvement
Training and Education	<b>National Fire Service College, Nagpur</b> provides training and education for fire service personnel

### Initiatives Taken for Fire Safety:

1. **Scheme for Expansion and Modernization of Fire Services in the States:** Launched by the Centre in 2023, aimed at strengthening fire services in the States until 2025-26.
2. **Model Bill to Provide for the Maintenance of Fire and Emergency Service for the State:** Circulated by the Centre to facilitate the maintenance of fire and emergency services at the state level.
3. **National Disaster Management Authority (NDMA) guidelines:** NDMA has released guidelines covering scaling, types of equipment, and training for fire services across the country.

### Roles and responsibilities of the government for risk mitigation:

- **Policy-driven planning:**
  - A policy should be written to **address cities** that are expected to **grow significantly** in size in the near future.
  - Through this, cities should be required to **reserve physical spaces for fire stations**, fire hydrants, and fire lanes/parking spots, thus **ensuring ready access**.
- **Increasing the investment:**
  - Growing high-rises in urban areas necessitate the **procurement of specialised equipment** for fire-fighting.
  - There must be continued **investments in equipment and infrastructure** to guarantee the safety of the citizens.
    - Sadly, the fire and disaster management budget for Mumbai has declined by 38% over 3 years to 2020.
- **Prevention measures:**
  - **Fire drills and evacuation drills** should be conducted regularly in consultation with the city Fire Brigades and a log of the same shall be maintained.
  - Also, in Mumbai, for instance, often, buildings or shops that hold less than 50 people do not have fire code restrictions.
    - Such loopholes should be closed, ensuring **clear guidelines for all kinds of establishments**. Also, they should be **actively enforced** by the city governments.
- **Capacity building:**
  - There is a considerable **gap in the operational capabilities** of fire and emergency services in Indian cities.
  - **Measures needed** in this regard include -
    - Installation of firefighting systems
    - Restriction of cooking to designated spaces
    - The use of safer cooking energy

sources and lighting means

- Improvements in vehicle access routes to neighbourhoods
- **Focusing on residential buildings:**
  - Most fire-related fatalities happen in residential buildings; **58% of the fatalities in 2019**. In contrast, around 2% of fatalities were in factories.
  - So, the focus has to be on residential buildings in order to **cut down on both accidents and related fatalities**.
  - Here, proper implementation of the **National Building Code (NBC) of 2016** that sets out guidelines has to be ensured. E.g.,
    - i. Carrying out a **fire safety audit** in all buildings over 15 metres once in 2 years by an independent entity.
    - ii. Constructing the building with **fire-resistant/retardant materials** and installing **smoke detection systems and fire alarms**.
    - iii. **Fire compartmentalisation** (area/floor wise) should be made mandatory to restrict the spread of fire through horizontal and vertical spaces.
    - iv. Once electrical and fire installations are in place, they should be **certified by authorised persons** and agencies.
- **Ensuring easy access:**
  - There have to be **dedicated access lanes** for the quick movement of **emergency vehicles**.
  - Under the Smart Cities Mission, '**smart control rooms**' should be able to guide emergency vehicles through the shortest route and **enable coordination** among various departments.

### Measures needed at the civilian level:

- **Awareness generation:**
  - In **schools, the curriculum** should have a chapter on fire safety.
    - **Regular drills** should be conducted so that children are prepared to handle such incidents.
  - **Communities** managing housing and commercial premises need to **regularly organise awareness programmes** with assistance from authorised persons and agencies.
    - These need to be not only on fire safety but also on other disasters such as earthquakes and floods.
- **Community-based fire risk management:**
  - Local communities should be actively engaged in the **identification, analysis, treat-**

ment, monitoring, and evaluation of fire risks to reduce their vulnerabilities and enhance their capacity.

- **Capacity building at the root level:**
  - **Efficient communication links** should be established between civilian groups in vulnerable areas and city fire brigades.
  - The social and **informal networks within the settlement** should be capitalised for rescue and assistance during fire outbreaks.
    - For this to work effectively, the **fire hydrants** existing within the settlement’s boundaries should be **kept in working condition** through **regular monitoring, and necessary replacements** will have to be made.

**Conclusion**

India and all countries around the world must see the **importance of fire safety when building and extending cities**. It is high time safety is taken seriously and **violators are brought to book**. An **integrated mechanism** involving **government players and the community** could go a long way in reducing risks and bringing down fatalities.

**Insta Links:**

- [FIRE SAFETY IN INDIA](#)

## 12. RISING HEAT STRESS AND ITS MITIGATION

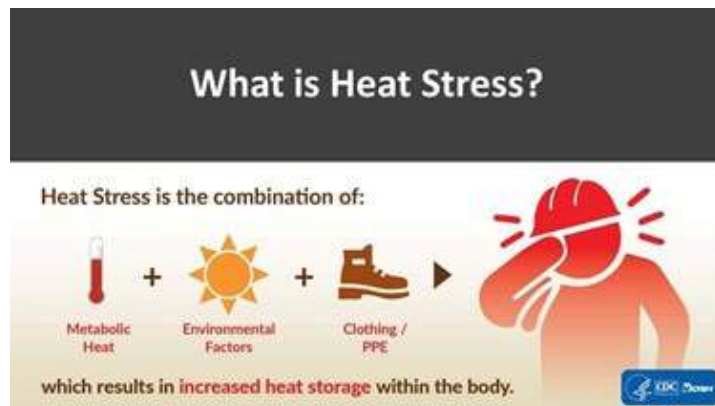
**Context:**

Rising temperatures in urban India are not solely due to climate change but also a result of increased concretization and urban sprawl, **contributing to severe heat stress**.

India’s major cities, including **Delhi, Mumbai, Chennai, Bengaluru, Kolkata, and Hyderabad**, are facing worsening **heat stress** due to rising relative humidity over the past two decades and increasing **Urban Heat Island Effect**, according to a study by the **Centre for Science and Environment**.

**What is Heat stress?**

It occurs when the **body cannot effectively release excess heat**, leading to a rise in core temperature and increased heart rate. It’s a **physiological strain** experienced in high-temperature environments. Causes include high ambient temperatures, **humidity, physical exertion, inadequate hydration**, and poor ventilation. Symptoms include difficulty concentrating, irritability, sickness, and loss of thirst, progressing to fainting and potentially death if not cooled down.



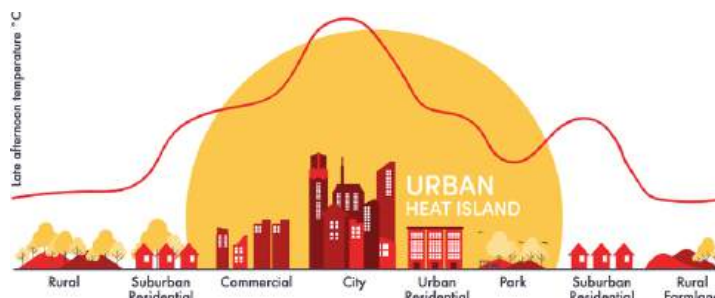
**What other factors exacerbate Heat Stress?**

In major Indian cities, heat stress is exacerbated by factors such as **air and land surface temperature, relative humidity, and rapid urbanization** with increased concretization. Climate change has worsened heat waves by **raising temperatures and humidity levels**. Additionally, changes in land use and urban sprawl contribute to the “**urban heat island effect**,” trapping heat in city centres. This poses a significant risk to vulnerable groups like the elderly, infants, pregnant women, slum dwellers, and outdoor workers.

According to the World Health Organisation **heat stress linked to climate change** is likely to cause **38,000 extra deaths a year** worldwide between 2030 and 2050.

**What is the Urban Heat Island Effect?**

The Urban Heat Island (UHI) effect describes **urban areas experiencing higher temperatures than rural surroundings** due to human activities and urban characteristics. Causes include surface materials like asphalt and concrete, heat from industrial processes and vehicles, reduced vegetation, building density, and waste heat.



**Impact of heat stress/heat waves:**

- **On Human Health:**
  1. **Heat-related illnesses:** Heat waves can cause heat exhaustion, heat cramps, and heatstroke, which can lead to dehydration, fatigue, and even death.
  2. **Exacerbation of existing conditions:** People with existing health conditions such as respiratory diseases and cardiovascular diseases are more vulnerable during heat waves.
  3. **Mental health:** Heat waves can also impact mental health, causing stress, anxiety, and other mental health issues.
  4. **Affected Regions:** Southern Asia and western Africa are expected to be the hardest hit, with approximately 5% of working hours lost by 2030. India could **lose 5.8% of its working hours**, affecting 34 million jobs, mainly in agriculture and construction.
  5. **Social Consequences:** Heat stress may deepen inequality between low and high-income countries, worsen conditions for vulnerable workers, and lead to increased migration as people seek better opportunities, impacting both men and women in agriculture and construction.
- **On Environment:**
  1. **Water resources:** Heat waves can lead to droughts, reducing the availability of water resources for agriculture and domestic use.
  2. **Wildlife:** Heat waves can impact wildlife, leading to habitat loss and increased mortality rates.
  3. **Air quality:** Heat waves can worsen air quality, leading to respiratory issues and other health problems.
- **On Economy:**
  1. **Economic Loss:** Heat stress may cost the global economy **\$2.4 trillion** annually, with a projected 2% loss in total working hours worldwide.
  2. **Affected Sectors:** Agriculture, particularly for women, and construction will suffer the most, with an estimated 60% and 19% loss in working hours by 2030, respectively.
  3. **Agriculture:** Heat waves can impact crop yields and agricultural productivity, leading to economic losses for farmers and the agricultural industry.
  4. **Energy consumption:** Heat waves can lead to increased energy consumption as people use more air conditioning and other cooling systems.
  5. **Tourism:** Heat waves can impact the tourism industry, leading to decreased revenues for businesses that rely on tourism.

**Measures Already Taken:**

1. **National Level:** The Indian government has

launched a **National Action Plan on Climate Change**, which includes measures to address heat waves and other climate-related issues.

- a. **National Action Plan for Climate Change (NAPCC):** Includes 8 national missions focusing on various aspects of climate change mitigation and adaptation.
  - b. **India Cooling Action Plan (ICAP):** Aims to reduce cooling demand by 20-25% and refrigeration demand by 25-30% by 2037.
  - c. **NDMA Guidelines:** Comprehensive guidelines issued in 2016 by the National Disaster Management Authority for mitigating the impact of heatwaves.
2. **State and City Level:** Many state governments and city administrations have taken measures such as opening cooling shelters, distributing free drinking water, and implementing heat wave warning systems.
  3. **Civil Society Organizations (CSOs):** Several CSOs are working to raise awareness about the impacts of heat waves and provide support to vulnerable communities.

**Measures that Need to be Taken:**

1. **Heatwave preparedness:** There is a need for increased heat-wave preparedness, including the development of early warning systems and emergency response plans. **E.g. Heatwave early warning systems**
2. **Urban planning:** Urban planning should focus on designing cities that are more resilient to heat waves, such as increasing green cover and promoting the use of reflective materials. **e.g. urban heat wave preparedness plans**
3. **Sustainable agriculture:** There is a need for sustainable agricultural practices that are more resilient to heat waves, such as crop diversification and better water management.
4. **Community engagement:** There is a need for community engagement and awareness-raising activities to ensure that vulnerable populations are aware of the risks of heat waves and can take necessary precautions.
5. **Green infrastructure:** India can promote the use of green infrastructure, such as **green roofs and urban green spaces, green transport** which can help to reduce the heat island effect in cities and lower temperatures.
6. **Climate resilient infrastructure:** E.g. heat-resistant buildings and water conservation measures
7. **Policies and Guidelines:** Develop weather variability and urban heat management policies.
8. **Public Awareness:** Educate people about heatwave risks and reducing carbon footprint.
9. **Agricultural Adaptation:** Support farmers with resilient farming practices
10. **Disaster Management:** Develop emergency response plans and cool shelters.
11. **Short-term Measures:** Establish an early warning

system and integrate it with public health services.

- Long-term Measures:** Implement structural infrastructure changes for heat adaptation.

**Conclusion:**

Heat waves are a serious threat to human health, the environment, and the economy. While some measures have already been taken to mitigate their impacts, more needs to be done to ensure that vulnerable populations are protected and that the country is better prepared for future heat waves.

**What is a Heatwave?**

The IMD says a heatwave is considered when the maximum temperature of a station touches at least **40 degrees Celsius or more for plains, 37 degrees Celsius** or more for coastal regions and at least 30 degrees Celsius or more for hilly regions. A 'Heatwave' is declared when the departure from normal temperature is by **4.5 to 6.4** degrees Celsius and a 'severe heatwave' is when the departure from normal is more than **6.4 degrees Celsius**.

Heat wave Scenario	40°C	30°C
Maximum Temperature	Plains	Hills
<b>Heat wave conditions prevail when...</b>	<b>Severe heat wave conditions prevail when...</b>	
Normal maximum temperature	Normal maximum temperature	Normal maximum temperature
Deviation from normal	Deviation from normal	Deviation from normal
Above	Above	Above
40°C	40°C	40°C
4-5°C or more	6°C or more	7°C or more
At or below	At or below	At or below
40°C	40°C	40°C
5-6°C or more	7°C or more	

**Insta Links:**

- [Heat stroke](#)

**Mains Links:**

**Q:** Bring out the causes for the formation of heat islands in the urban habitat of the world.

Topics: Challenges to internal security through communication networks, role of media and social networking sites in internal security challenges, basics of cyber security; money-laundering and its prevention

## 13. ARTIFICIAL INTELLIGENCE AND ITS IMPACT ON CYBERSECURITY

**Context:**

In the era of AI, cybersecurity is paramount to protect against rising threats posed by generative AI misuse, necessitating collaborative solutions for safe digital navigation.

**What is Cybersecurity?**

Cybersecurity encompasses **strategies and measures aimed at protecting computer systems, networks, and data from unauthorized access**, cyberattacks, and data breaches. It involves safeguarding against threats such as **hacking, malware, phishing**, and other malicious activities that can compromise digital information and systems.

**Evolving nature and increasing sophistication of cyber threats.**

- New targets:** While there has been a decreased trend of attacks on end users **attacks on enterprises and SMEs are increasing.**
- New forms of technology:** New types of malware, such as **automated phishing tools and crypto mining software** combined with emerging technologies, are expanding the cyber risk landscape.
  - A host of digital technologies, such as **AI, automated botnets, the Internet of Things (IoT), and cloud computing** facilitate sophisticated attacks.
- Potential Unwanted Programs (PUP) and Potentially Unwanted Applications (PUA),** masquerading as legitimate apps, are increasingly used to victimize users.
- Using Cryptocurrency:** E.g., **In Dec 2021, botnet Phorpiex** hijacked hundreds of cryptocurrency transactions in India, Ethiopia and Nigeria. The bot has **attacked 969 transactions and has stolen crypto assets worth almost \$0.5 million.**
  - The botnet used a **new attack method called crypto-clipping** that steals cryptocurrency including bitcoin, Ethereum and dogecoin during a transaction, by substituting the original wallet address saved in the clipboard with the attacker's wallet address.
- Since many enterprises are shifting their infrastructure to **cloud-based platforms, i.e., to data centres**, the attackers would target those platforms at an increasing rate.
  - For instance – There have already been several reports of attacks or attempted attacks on **Microsoft's Office 365 platform.**
- Supply chain attacks, such as those used in the **Not-Petya malware campaign**, can be penetrative and lethal.

**AI is impacting cybersecurity in several ways:**

- Increased Phishing Attacks:** Phishing emails surged by 1,265%, and credential theft rose by 967% since late 2022 due to AI.
- Voice Cloning for Fraud:** Hackers imitated a mother's daughter's voice to extort money, highlighting the risks of AI-based scams.
- Enhanced Hacking Sophistication:** AI helps hackers translate code, identify vulnerabilities, and amplify attacks.
- Rising Attacks on Organizations:** 75% of profession-

als reported more cyberattacks last year, while 85% linked the trend to AI.

5. **Privacy Erosion:** Voice-activated toys and biometric systems threaten individual privacy.
6. **Cybercrime:** According to data from **CERT-IN**, cyber crimes in India have witnessed a 572% increase in the last 3 Years

**Reasons for increasing cyber threats in India from AI:**

1. **Fragmented cybersecurity infrastructure:** Responsibility for cybersecurity in India is spread across various government agencies and private entities, leading to a lack of coordinated strategies.
2. **Apathy towards data privacy:** Despite the **Digital Personal Data Protection Act 2023**, implementation of secure cyber systems by private and government entities is lacking, as seen in the recent PayTM payments bank ban.
3. **Large digital divide:** Many lack digital literacy, making them vulnerable to phishing attacks and scams.
4. **Skill shortage:** India lacks qualified cybersecurity professionals, hindering effective threat detection and response.

**Countermeasures taken by India against cyber threats.**

- **For Critical information infrastructure (CII)-** Creation of the National Critical Information Infrastructure Protection Centre, the national nodal agency in respect of CII protection. It was envisaged to act as a 24x7 centre to battle cyber security threats in strategic areas such as air control, nuclear and space.
  - Establishment of **Defence Information Assurance and Research Agency** for cyber security issues of the tri-services and Defence Ministry.
- **For the Financial sector -** CERT-Fin will work closely with all financial-sector regulators and stakeholders on issues of cyber security.
- **Establishment of cyber security infrastructure**
  - **CERT-in** - The main function of CERT-In is to provide early security warning and effective incident response. It is also a national agency to collect, analyze and disseminate information on cyber incidents and takes emergency measures for handling cyber-attacks.
  - **IT Act 2000** - This act provides a legal framework against cybercrimes related to "electronic commerce".
  - **National Cyber Security Policy 2013** has been framed to create a secure cyber ecosystem, ensure compliance with global security systems and strengthen the regulatory framework.
- **Others**
  - **I4C (Indian Cyber Crime Coordination Center)** was set up in 2016 to look into every kind of cybercrime.
  - **The Indian Common Criteria Certification Scheme**

**(IC3S)is** to evaluate and certify IT Security Products and Protection Profiles.

- **Cyber Swachhta Kendra** was introduced for internet users to clean their computers and devices by wiping out viruses and malware.
- **Cyber Surakshit Bharat Initiative** was launched to spread awareness about cybercrime and build capacity for safety measures for Chief Information Security Officers (CISOs) and frontline IT staff across all government departments.

**Global Effort: Bletchley Declaration:**

The Bletchley Declaration, named after the historic code-breaking site, signifies a **global commitment to addressing AI's ethical and security challenges**, particularly generative AI. Signed at the AI Safety Summit (in 2023), it highlights the increasing global recognition of AI risks and involves major world powers like China, the EU, India, and the US.

**Measures need to be taken:**

**By individuals**

- **Apply critical security patches**, especially on public-facing servers, and keep end-point security software up-to-date.
- **Ignore emails from unknown sources**, thus avoiding becoming a victim of phishing and spear phishing attacks.
- **Use complex passwords** (not to mention, change passwords regularly).

**By government**

1. Strengthen cybersecurity agencies and partnerships.
2. Invest in AI-driven cybersecurity solutions.
3. Promote digital literacy and awareness.
4. Establish robust cybersecurity laws.
5. Develop cybersecurity skills through training.

**Conclusion**

Even though the government has taken various measures to curb cyber-attacks, recent cyber threat incidents like the Pegasus cyber-attack, attack on India's COWIN app etc show loopholes in India's cyber security framework. **Research and development, Funding and capacity building** in cyber security are the need of the hour for GOI.

**Various types of Cybersecurity threats:**

Category	Description
Cybercrime	Mainly targeted against individuals, firms, etc. Involves the use of computers or networks in the execution of a crime or as the target.
	E.g., a <b>Malware attack on the City Union Bank's SWIFT system</b> in March 2020 led to unauthorised transactions worth USD 2 million.

<b>Cyber warfare</b>	Consists of attacks on the computer systems of a country or its institutions to disrupt, damage, or destroy infrastructure. For the <b>Cyberattack on the Kudankulam Nuclear Power Plant</b> .
<b>Cyber spying</b>	Involves obtaining secrets and information without permission or knowledge from individuals, groups, or governments for personal, economic, political, or military advantage using methods on the Internet, networks, or individual computers via proxy servers. For ex- <b>Operation Side Copy</b> , a cyber espionage campaign targeted Indian military and diplomatic personnel with malware and phishing emails.
<b>Cyber terrorism</b>	Defined as premeditated, politically motivated attacks against information systems, programs, and data that threaten or result in violence.
<b>Illegal data mining</b>	Involves unauthorized extraction of valuable data for economic gain from the vast amounts of data generated by growing online transactions.

**Insta Links:**

- [Cybersecurity Challenges in India](#)

**Mains Link:**

**Q. Keeping in view India’s internal security, analyse the impact of cross-border cyber-attacks. Also, discuss defensive measures against these sophisticated attacks. (UPSC 2021)**

**Prelims Link:**

**Q. With the present state of development, Artificial Intelligence can effectively do which of the following? (UPSC 2020)**

1. Bring down electricity consumption in industrial units
2. Create meaningful short stories and songs
3. Disease diagnosis
4. Text-to-Speech Conversion
5. Wireless transmission of electrical energy

Select the correct answer using the code given below:

- (a) 1, 2, 3 and 5 only
- (b) 1, 3 and 4 only
- (c) 2, 4 and 5 only
- (d) 1, 2, 3, 4 and 5

**Ans: B**

Topics: Various Security forces and agencies and their mandate.

## 14. THEATERISATION OF INDIA ARMED FORCES

**Context:**

The [article](#) highlights the necessity for **India’s armed forces to adopt specific theatre** commands for efficient defense planning.

**What are Theatre Commands?**

A theatre command in the military refers to a **specific geographical area** where military operations are planned, coordinated, and executed under a single command. It is a way of **organizing and managing military forces** within a particular region or theatre of operations.

The idea behind the Theatre Command System is to **enhance coordination and synergy among the Army, Navy, and Air Force**.

Currently, **almost all major countries like China, Russia, the US, the UK and France** are working on a theatre command concept.

**Case of China:**

1. China reorganised its **2.3-million People’s Liberation Army** into five theatre commands in 2016 to enhance offensive capabilities and establish improved command-and-control structures.
2. Its **Western Theater Command** looks after the entire border with India.

**Evolution of the concept in India:**



1. **Kargil Review Committee & Group of Ministers:** After the 1999 Kargil battle, highlighted the necessity for a unified war-fighting approach.
2. **Naresh Chandra Committee:** Advocated structural changes in higher defence management.
3. **Shekatkar Committee:** Led by Lt Gen. (retd) D.B. Shekatkar, recommended the creation of the CDS post and theatre commands, emphasizing unified planning.
4. **CDS Appointment & Department of Military Affairs (DMA):** Steps towards achieving jointness among the armed forces, following recommendations from the Shekatkar Committee.

**Why does India need theatre commands?**

1. India currently has **19 military commands**.
  - i. **17 of them are service-oriented** – 7 each for the Army and the Air Force and the Navy has 3.
  - ii. **A Tri-Service Command** – Andaman and Nicobar Command, and

the Strategic Forces Command (SFC looks after the country's nuclear stockpile).

- The aim is to **bring all the individual commands into four or five unified or theatre commands** to streamline military operations and enhance coordination and efficiency in a rapidly evolving security landscape.
- This will aid in better **planning, military response and a unified approach** to fighting future wars while also lowering costs.
- Case study – Acquisition of Apache attack helicopters from the US:** While the Indian Air Force got 22 Apaches, the Army has also placed orders for six of these choppers. The **end result is a loss of at least Rs 2,500 crore** and haphazard operational planning.

**Benefits of theaterization**

- Increased efficiency:** Rationalization of warfighting resources and execution efficiency for integrated action against threats.
- Cost-effective in the long run:** Although initial costs may rise, theaterization aids in better planning and military response, ultimately reducing long-term costs.
- Rationalization of command structure:** Theaterization aims to streamline the uneven command structure across the Indian military, bringing about a more balanced distribution of commands.
- Operational Efficiency:** Traditional separation of forces for land, air, and sea combat leads to inefficiencies.
- Specific Theatres:** Strategic positioning of forces in specific regions such as Jaipur for western threats, Lucknow for northern threats, and Coimbatore for maritime threats.
- Resource Optimization:** Integrated Theatre Commands (ITCs) ensure better resource utilization and readiness improvement.
- Evolving Warfare:** Modern warfare requires quick and coordinated responses, which separate commands cannot efficiently provide.

**Steps taken towards theaterisation in India:**

- The Inter-Services Organisations (Command, Control and Discipline) Bill 2023** includes a provision regarding a joint services command.
- CDS Appointment:** India appointed its first Chief of Defence Staff (CDS) nearly five years ago to oversee defence reforms.
- ITC Proposal:** A concrete plan for Integrated Theatre Commands (ITCs) signals progress in restructuring.
- Leadership Roles:** The proposed structure includes a vice-CDS for strategic planning and procurement and a deputy CDS for operations and intelligence.
- Operational Coordination:** While service chiefs lead

their forces, combat operations will be managed by top officers with a strategic view.

- The cross-staffing initiatives** are aimed at areas of commonality, such as equipment like UAVs and the BrahMos supersonic cruise missiles.
- Steps are being taken to introduce “common annual confidential reports”** for all two and three-star generals across the armed forces to synergise the appraisal system for tri-service appointments.

**Planned Theatre Commands**

According to the current proposal, there will be five theatre commands, namely

- Northern Land Theatre** (Jammu and Kashmir, Ladakh and Central sector; China and Pakistan centric)
- Western Land Theatre** (Pakistan-centric)
- Eastern Land Theatre (China-centric)**
- Maritime Theatre Command** (merging of the eastern and western naval commands, besides getting elements from the Army and the Air Force)
- Air Defence Command**
- Integrated Logistics Command**



**Challenges:**

- IAF's Concerns:** IAF supports theaterization but prefers a single theatre to maintain control over its assets.
- Service Culture Differences:** The distinct cultures and operational methods of the Army, Navy, and Air Force pose challenges to integration.
- Massive Funding Required:** Establishing the infrastructure for theatre commands necessitates significant financial resources.
- No Need for Theaterization:** Some experts argue against theatre commands, citing past cooperation

among services during warfare and the lack of precedent in other countries.

**Way forward:**

- Implement ITCs:** Prioritize the establishment of Integrated Theatre Commands for operational efficiency.
- Strategic Leadership:** Appoint vice-CDS and deputy CDS roles for strategic planning and operations.
- Equipment Upgrades:** Ensure continuous modernization of military equipment.
- Consensus on AI Use:** Develop a consensus on AI-led strikes to minimize collateral damage.
- Supportive Ecosystem:** Focus on indigenous technology and self-reliance in defense.
- Managing Internal & External Security:** Assess how internal and external security will be managed under theater commands.
- Parliament’s Role:** Establish a dedicated parliamentary committee staffed with military advisers to monitor the transition.
- Service-Neutral Commands:** Ensure no theatre “belongs” to any service; appoint commanders based on talent and experience.
- Modular Structure:** Modularize armed forces into smaller, networked brigades for enhanced deployability and sustainability.

**Conclusion:**

India has the world’s 4th largest military, but its services operate independently. While theatre commands are needed, their launch should not be rushed. For effective theatre commands, a national security strategy and appropriate tri-service structures are essential. They should be prepared for future warfare, including space and cyber domains, without complicating decision-making processes.

**Insta Links:**

- [The Inter-Services Organisations \(Command, Control and Discipline\) Bill 2023](#)

**GENERAL STUDIES – 4**

**1. FROM KAUTILYA TO IMMANUEL KANT: LESSONS FOR A WORLD AT WAR**

**Context:**

Kant’s rationality and ethics remain relevant in today’s world, fraught with geopolitical interests and fake news.

**Who was Immanuel Kant?**

Immanuel Kant (1724-1804) was a German philosopher from Königsberg, Prussia. He is best known for his works in epistemology, ethics, and metaphysics, particularly the “Critique of Pure Reason.” Kant’s philosophy emphasized

reason, rationality, and autonomy, and he argued for perpetual peace, open trade, and the idea of a world citizen. His ideas continue to influence contemporary thought in various fields, including ethics, politics, and international relations.

Key Ideas	Description
Rejection of Imperialism and Colonialism	Kant opposed imperialism, colonialism, and slavery, advocating for the autonomy of nations and individuals.
Support for Open Trade and Immigration	He believed in the benefits of open trade and supported the right to refuge and free movement of people.
Concept of a World Citizen	Kant introduced the idea of a “world citizen” who could travel freely across borders, promoting global unity.
Emphasis on Reason, Rationality, and Morality	Kant stressed that political actions should be guided by reason, rationality, and ethical principles.

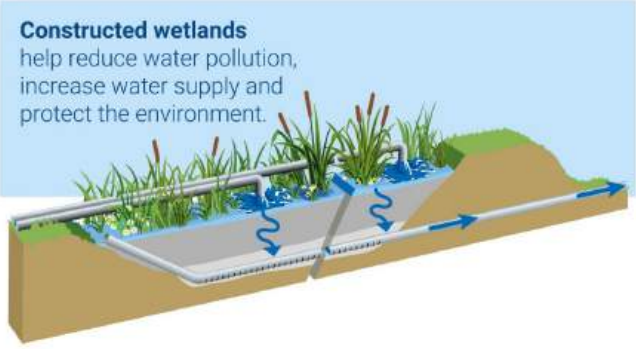
**Relevant to his ideas in today’s world:**

- Crisis in Multilateral Order:** Kant’s ideas are being reassessed due to dysfunctionality in the multilateral order, as seen with the UN’s struggles.
- Global Citizenship:** His concept of a “world citizen” resonates in today’s globalized world, advocating for free movement and open trade.
- Ethics and Rationality:** Kant’s emphasis on reason, rationality, and morality remains crucial in addressing issues like terrorism and aggression by nations.
- Global Non-Self-Governing Territories:** Kant’s rejection of imperialism and colonialism is relevant as 17 territories still seek self-government, reflecting ongoing colonial legacies.
- Modern Challenges:** Kant’s vision of “perpetual peace” contrasts with today’s realities of global terrorism, multinational corporations, and AI-driven warfare.

India’s perspective emphasizes its ancient strategic culture, which draws wisdom from texts like the Ramayana, Mahabharata, Arthashastra, and Tirukkural, assessing statecraft through the lens of ethics. During its G20 Presidency, India promoted the motto “One Earth, One Family, One Future,” inspired by Vasudhaiva Kutumbakam, reflecting its commitment to global unity. Rooted in its cultural heritage, India values serving humanity. It aims to blend Kant’s ideas with its own ancient teachings, offering a new moral compass for international relations.

**CONTENT FOR MAINS ENRICHMENT**

CONTEXT	USE IN ANSWER WRITING
<p><b>1. PERCOLATION WELLS</b></p>	<p><b>Context:</b> Percolation wells, <a href="#">a solution to Bengaluru’s water crisis</a>, capture rainwater to restore and recharge groundwater.</p> <p><b>What are Percolation Wells?</b> Percolation wells are <b>earthen dams, typically 12 feet deep and 4 feet wide</b>, filled with gravel and lined with concrete rings. They capture rainwater, allowing it to percolate down through layers of soil, recharging natural aquifers. These wells are <b>designed to restore and conserve groundwater</b>, offering a sustainable solution to water scarcity in urban areas like Bengaluru.</p> <div> </div> <ul style="list-style-type: none"> <li>▪ To divert rainwater into an aquifer,</li> <li>▪ The percolation pit is covered with a perforated concrete slab</li> <li>▪ The pit is filled with gravel/pebbles followed by river sand for better percolation.</li> <li>▪ The top layer of sand must be cleaned and replaced at least once in two years to remove settled silt for improving the percolation</li> </ul> <p><b>United Way of Bengaluru</b> (a unit of the <b>global United Way network</b>, a privately-funded non-profit organisation founded 132 years ago) aims to build <b>10,000 wells by 2026</b>, already completing 3,600 with private funding. These wells <b>have revived borewells in Lal Bagh</b> and are now being adopted by local municipalities to combat water scarcity. Scientifically built, they <b>trap rainwater and recharge aquifers</b>, offering a sustainable approach to water management amid urbanization challenges.</p>
<p><b>2. SOCIAL CONSTRUCTION OF TECHNOLOGY THEORY</b></p>	<p><b>3. WHAT IS SCOT THEORY?</b></p> <p><a href="#">Social Construction of Technology (SCOT) theory</a> posits that <b>technological development is influenced by social factors rather than being solely driven by inherent technological capabilities</b>.</p> <p>It emphasizes that <b>technologies are not inherently good or bad but are shaped by the values, interests, and needs of society</b>. SCOT examines how various social groups influence the design, development, and implementation of technologies, highlighting the role of power dynamics, cultural norms, and user preferences in shaping technological outcomes.</p> <p><b>Usage:</b> The theory can be used in Indian society/Sociology to demonstrate the interaction of Society with evolving technology.</p>

<p><b>4. VIRTUAL TOUCH</b></p>	<p><b>Context:</b> Apart from the concepts of “good touch” and “bad touch”, minors must be taught the concept of “virtual touch” to enable them to recognise potential risks in cyberspace: Delhi HC</p> <p>The court made the observations while refusing to grant bail to a woman accused of helping the main accused, her son, commit sexual assault upon a 16-year-old girl in 2021.</p> <p><b>What is ‘Virtual Touch’?</b></p> <p>‘Virtual Touch’ refers to the concept of <b>teaching minors to recognize potential risks in cyberspace, alongside traditional concepts of “good touch” and “bad touch.”</b> It involves educating them about appropriate online behaviour, identifying warning signs of predatory behaviour, understanding the importance of privacy settings and online boundaries, and developing critical thinking skills to assess the credibility of online contacts and safeguard personal information.</p>
<p><b>5. CON-STRUCTED WETLANDS</b></p>	<p>Constructed wetlands are engineered ecosystems designed to replicate the functions of natural wetlands for the purpose of treating wastewater. These systems utilize vegetation, soil, and microbial processes to remove contaminants and pollutants from water before it is discharged back into the environment.</p> <p>Constructed wetlands are effective in <b>treating various types of wastewater, including domestic sewage, industrial effluents, and stormwater runoff.</b> They are often used as an <b>alternative to traditional wastewater treatment</b> methods, offering advantages such as lower operational costs, environmental benefits, and versatility in design and application. Additionally, <b>constructed wetlands can provide habitat for wildlife,</b> improve water quality, and contribute to flood control and carbon sequestration.</p> <div>  <p><b>Constructed wetlands</b> help reduce water pollution, increase water supply and protect the environment.</p> </div>
<p><b>6. JIM SIMMONS</b></p>	<p><b>Context:</b> Jim Simmons passed away recently.</p> <p>The world believed that <b>there was only one way to make money in the stock market,</b> and that was <b>fundamental analysis (and not technical analysis).</b> While many traders in the past achieved solid outperformance without fundamental analysis, <b>Jim Simmons (an American hedge fund manager, mathematician, and philanthropist)</b> stood out because he did it with a large hedge fund.</p> <p><b>Benjamin Graham (fundamental king) said,</b> “People who invest make money for themselves; people who speculate (referred to as short-term trading using technical analysis) make money for their brokers.”</p> <p>If Jim had blindly believed that <b>short-term trading could not make money,</b> we would not have Jim Simmons in this world.</p> <p>The lesson is to <b>always be open and receptive to new ideas and ways of doing things.</b></p> <p><b>Billionaire investor James Simons was also</b> known as the <b>“Quant King”</b> for his pioneering use of computer signals in trading decisions. Simons, founder of <b>Renaissance Technologies LLC,</b> transitioned from <b>mathematics and intelligence work</b> to becoming a Wall Street legend. His firm, <b>Renaissance,</b> achieved extraordinary success with its <b>Medallion Fund,</b> known for its high returns and low risk.</p>

<p><b>7. ETHICAL DUTIES OF DOCTORS</b></p>	<p><b>Context:</b> The Madras High Court <u>criticized doctors who try to avoid serving in public hospitals</u> after benefiting from subsidized education.</p> <p><b>Some key ethical values of doctors:</b></p> <ol style="list-style-type: none"> <li>1. <b>Compassion:</b> Showing empathy and care towards patients' suffering and needs.</li> <li>2. <b>Integrity:</b> Upholding honesty, truthfulness, and ethical conduct in all interactions.</li> <li>3. <b>Professionalism:</b> Demonstrating dedication, responsibility, and respect for patients, colleagues, and the profession.</li> <li>4. <b>Confidentiality:</b> Safeguarding patients' privacy and maintaining confidentiality of their medical information.</li> <li>5. <b>Autonomy:</b> Respecting patients' right to make informed decisions about their own health-care.</li> <li>6. <b>Beneficence:</b> Acting in the best interest of patients and promoting their well-being.</li> <li>7. <b>Non-maleficence:</b> Avoiding harm to patients and minimizing risks associated with medical treatment.</li> <li>8. <b>Justice:</b> Ensuring fairness and equity in the distribution of healthcare resources and access to medical care.</li> </ol>
<p><b>8. DEEP-MIND'S TACTICAI IN FOOTBALL</b></p>	<p>AI in football, specifically in <u>corner kicks</u>, is gaining traction for its potential to enhance team strategies.</p> <p><u>DeepMind's TacticAI</u> is a notable example, offering insights through predictive and generative AI. Developed in <u>collaboration with Liverpool FC</u>, TacticAI suggests tactics for corner kicks, with human experts preferring its <u>suggestions 90% of the time</u>. By analyzing player setups and predicting outcomes, <u>AI assists coaches in optimizing corner kicks</u>, leveraging graph representations and neural networks.</p> <p><u>Google's DeepMind's TacticAI</u> predicts corner kick outcomes using a "<u>Geometric deep learning approach</u>" ( part of machine learning, which focuses on developing algorithms for analyzing data with geometric structures like graphs, point clouds, and meshes)</p> <p>The example can be used as an application of AI in sports.</p>
<p><b>9. PLAYTRUE CAMPAIGN</b></p>	<p><b>Context:</b> The National Anti-Doping Agency (NADA) India recently wrapped <u>up its #PlayTrue Campaign</u>, attracting over 12,133 participants.</p> <p><b>What is the #PlayTrue Campaign?</b></p> <p>The #PlayTrue Campaign, organized by NADA India, aims to raise awareness about clean sports and anti-doping practices. Through activities like quizzes and awareness sessions, it promotes fair play and integrity in sports, aligning with the World Anti-Doping Agency (WADA) vision.</p> <p><b>Sports ethics</b> essentials include promoting <u>fair play, and integrity, and rejecting doping</u>. It emphasizes the importance of clean competition and upholding anti-doping regulations to ensure a level playing field for all athletes.</p>

**10. 30 YEARS SINCE APARTHEID ENDED IN SOUTH AFRICA**

**Context:** South Africa prepares to commemorate **30 years of freedom amidst ongoing challenges of inequality, poverty,** and a tense upcoming election.

**What was Apartheid?**

It was a system **of institutionalized racial segregation and discrimination** enforced by the **South African government from 1948 to 1994**. Under apartheid, **non-white South Africans**, particularly black people, were **systematically oppressed and denied basic rights**, including the right to vote and access to education, healthcare, and employment opportunities.

For example, the **apartheid government enforced laws such as the Group Areas Act**, which designated **specific residential areas for different racial groups**, leading to forced removals of non-white communities from their homes to segregated townships.

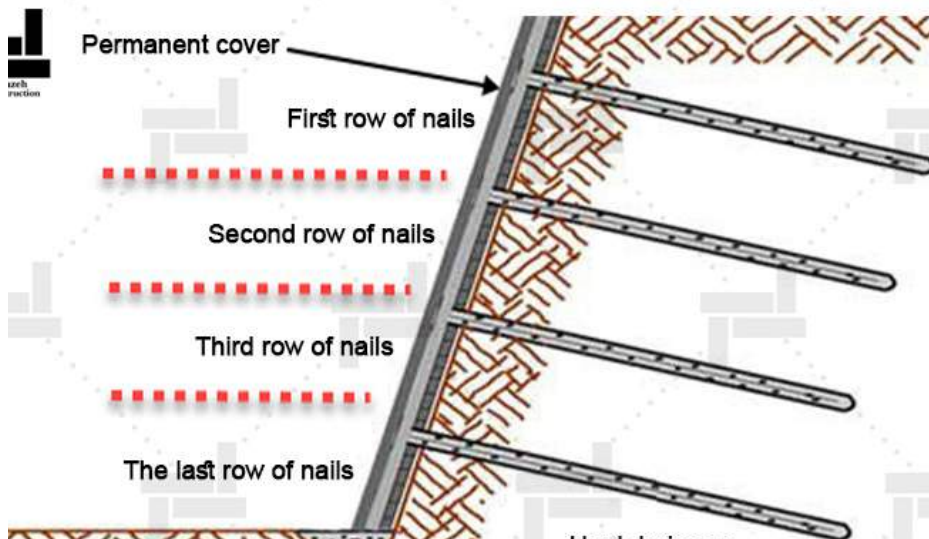
**The apartheid regime in South Africa was characterized by numerous ethical issues:**

1. **Racial Discrimination:** Apartheid systematically oppressed non-white South Africans, **denying them basic rights** solely based on their race.
2. **Segregation:** The regime enforced strict segregation laws, which led to the **forced removal of non-white communities** from their homes to designated areas, resulting in the disruption of families and communities.
3. **Violence and Oppression:** The apartheid government employed **violence and repression to maintain control** over the non-white population, including the use of police brutality, torture, and imprisonment of political dissidents.
4. **Inequality:** Apartheid institutionalized economic and social disparities between racial groups, with non-white South Africans facing limited access to education, healthcare, employment, and housing opportunities compared to their white counterparts.
5. **Denial of Political Rights:** Non-white South Africans were denied the right to vote and participate in the democratic process, further marginalizing them politically and reinforcing white minority rule.

**11. SOIL NAILING**

**Context:** The State highways department in the **Nilgiris is implementing a 'green' solution to prevent landslips by stabilizing slopes along major roads**. Using the 'slope stabilisation using soil nailing and Hydroseeding method,' they're working in **Ketti, Kattabettu, Perar, Kudah, and Udhamandalam**, areas prone to landslips.

Soil nailing is a **geotechnical engineering technique** involving the insertion of reinforcing elements, typically steel tendons, into the soil to strengthen it. Methods include drilled and grouted, driven, drilling, jet grouted, and launched soil nailing. It is commonly used for stabilizing slopes and landslides, supporting excavations, and repairing retaining walls.



**Hydroseeding:**

**Hydroseeding is a process of applying a mixture of seeds, fertilizer, organic materials,** and water onto the soil to facilitate the growth of grass and plant-life. This helps hold the topsoil together and prevent erosion.

<p><b>12. WORLD TELECOM-MUNICATION AND INFORMATION SOCIETY DAY</b></p>	<p><b>Context:</b> India Celebrates '<b>Telecom Diplomacy</b>' on <a href="#">World Telecommunication and Information Society Day</a></p> <p><b>World Telecommunication and Information Society Day</b> is an international day proclaimed in <b>November 2006 by the International Telecommunication Union Plenipotentiary Conference</b> in Antalya, Turkey, to be celebrated <b>annually on 17 May</b></p> <p><b>What is Telecom Diplomacy?</b></p> <p>Telecom Diplomacy is the <b>strategic effort by a country to use its telecommunications industry</b> to attract business ventures, form international partnerships, and secure a leading role in the global telecommunications landscape.</p> <p><b>Key initiatives by India include:</b></p> <ol style="list-style-type: none"> <li>1. <b>Strategic Partnerships:</b> Collaboration with countries and companies, exemplified by the '<b>US-India OpenRadio Access (ORAN) Network Acceleration Roadmap</b>'.</li> <li>2. <b>R&amp;D and Innovation:</b> Exploring collaborations to advance R&amp;D, innovation, and the startup ecosystem in <b>Quantum Communications</b>.</li> <li>3. <b>India Mobile Congress (IMC):</b> Efforts to elevate IMC to a global level like the Mobile World Congress by 2025.</li> <li>4. <b>Exported telecom equipment</b> worth Rs 25200 crores last year.</li> <li>5. <b>Secured Indian interests</b> in international forums and future 5G deployments.</li> <li>6. Hosting the <b>World Telecommunication Standardization Assembly (WTSA)</b> for the first time in India.</li> </ol> <p><b>About the International Telecommunication Union (ITU):</b></p> <p>It is the <b>United Nations specialized agency</b> for information and communication technologies (ICTs). Founded in 1865, it is the <b>oldest of the UN's 15 specialized agencies</b>. ITU allocates <b>global radio spectrum and satellite orbits</b>, develops technical standards for network interconnectivity, and aims to improve ICT access for underserved communities. Based in <b>Geneva, Switzerland</b>, ITU is part of the UN Development Group and operates 12 regional offices. It functions as an intergovernmental public-private partnership with 193 member states and around 800 sector members. India, a member since 1952, was re-elected to the ITU Council for the 2019-2022 term.</p>
<p><b>13. MAN-THAN (FILM)</b></p>	<p><b>Context:</b> In the mid-1970s, <b>half a million dairy farmers in Gujarat contributed two rupees each to fund "Manthan," India's first crowd-funded film</b>, directed by Shyam Benegal.</p> <p>This 1976 film depicts the rise of a <b>dairy cooperative movement inspired by Verghese Kurien</b>, transforming India into the world's top milk producer. Restored after 50 years, it premiered at Cannes recently.</p> <p><b>Values shown by this film:</b> "Manthan" portrays values such as community cooperation, social justice, empowerment of marginalized groups, and the <b>transformative power of collective action</b>. It highlights the significance of grassroots movements in driving social and economic change.</p> <p><b>About Dr. Verghese Kurien (1921-2012):</b></p> <p>Also known as the 'Father of the White Revolution in India,' he spearheaded '<b>Operation Flood</b>,' the world's largest agricultural program. He established 30 farmer-run institutions and played a key role in the success of the <b>Amul brand</b>, leading India to become the world's largest milk producer in 1998. His efforts extended to managing the <b>Delhi Milk Scheme</b> and making India <b>self-sufficient in edible oils</b>. Honoured with the <b>Ramon Magsaysay Award, Krishi Ratna, World Food Prize</b>, and India's highest civilian awards (Padma Shri, Padma Bhushan, and Padma Vibhushan), <b>National Milk Day on November 26</b> commemorates his birth anniversary.</p>

<p><b>14. INDIA'S 'ALL WE IMAGINE AS LIGHT' WINS GRAND PRIX</b></p>	<p><b>Context:</b> Indian director <u>Payal Kapadia's debut film "All We Imagine As Light"</u> won the Grand Prix prize.</p> <p><u>All We Imagine As Light is an Indo-French production</u> about a nurse, Prabha, and her friend, Anu, who embark on a transformative road trip. Kapadia's previous documentary, <u>A Night of Knowing Nothing</u>, won the Golden Eye award at Cannes.</p> <p><b>What is the Cannes Film Festival?</b></p> <p>The Cannes Film Festival is a <u>prestigious annual event held in Cannes, France</u>, showcasing international films and attracting global attention for its film premieres, red-carpet events, and exclusive industry gatherings. It <u>began in 1946</u> and is renowned for awarding <u>the prestigious Palme d'Or</u> to outstanding films.</p> <p><b>Festival Highlights</b></p> <ol style="list-style-type: none"> <li>1. <u>Features film premieres</u>, screenings, and exclusive industry events.</li> <li>2. <u>Red carpet events</u> attract global media attention.</li> <li>3. <u>Notable for awarding the prestigious Palme d'Or</u>, with films like "Taxi Driver," "Pulp Fiction," and "Parasite" among winners.</li> <li>4. The only Indian film to win the Palme d'Or was <u>"Neecha Nagar" in 1946.</u></li> </ol>
<p><b>15. ANSHU JAMSENPA</b></p>	<p><b>Context:</b> Anshu Jamsenpa, the <u>first woman from Arunachal Pradesh's Nyishi tribe</u>, has <u>scaled Mount Everest</u>.</p> <p><b>Values are shown by Her:</b></p> <p>Anshu Jamsenpa embodies <u>perseverance, resilience, and dedication</u>. She promotes the importance of hard work and <u>determination</u> in achieving one's goals. Her journey emphasizes the value of <u>courage and overcoming challenges</u>, serving as an inspiration for <u>aspiring mountaineers and adventurers</u>. Anshu's success also highlights the significance of <u>cultural pride</u> and the <u>empowerment of women</u> in traditionally male-dominated fields.</p> <p><b>About the Nyishi tribe, previously known as the Daffla</b></p> <p>It is the <u>largest ethnic group in Arunachal Pradesh</u>. They consider themselves descendants of Abo Tani, believed to be the first human, thus <u>aligning with the Tani Group of Tribes</u>, which includes the <u>Adi, Gallo, and Apatani</u>. Their society <u>lacks a caste system</u> and rigid class distinctions. <u>Polygyny</u> is practised, and their major festival is Longte.</p>
<p><b>Major Radhika Sen</b></p>	<p><b>Context:</b> Major Radhika Sen, an <u>Indian military peacekeeper</u> serving with the United Nations in the Democratic Republic of the Congo, will receive the <u>2023 United Nations Military Gender Advocate of the Year Award</u>.</p> <p><b>Her Contributions:</b></p> <p>She led efforts to engage with <u>conflict-affected communities</u>, particularly women and girls, in North Kivu. Her dedication and leadership exemplify the <u>principles of UN Security Council resolution 1325 on women, peace, and security</u>. Major Sen facilitated community alert networks, provided education and vocational training, and advocated for women's rights. She becomes the second Indian peacekeeper to receive this prestigious award.</p> <p><b>About the Award:</b></p> <p><u>The UN Military Gender Advocate of the Year Award</u>, established by the Office of Military Affairs in the Department for Peace Operations, honours a military peacekeeper who has effectively <u>integrated a gender perspective into peacekeeping activities</u>. Awardees are selected from nominees recommended by Force Commanders and Heads of Mission across all peace operations. The award acknowledges individuals' commitment to promoting the principles of <u>UN Security Council Resolution 1325 on Women, Peace, and Security</u>.</p>

## FACTS FOR PRELIMS

### GS-1

#### Art & Culture

### 1. HAGUE CONVENTION

#### Context:

UNESCO is commemorating the **70th anniversary of the Hague Convention for the Protection of Cultural Property in Armed Conflict**

The **Convention** is the **first legal framework solely dedicated to safeguarding movable and immovable heritage**. It shields **cultural property during both peace and conflict**. With 135 member states, including **India**, the Convention and its 1954 and 1999 Protocols aim to protect cultural treasures, with the latter introducing the concept of Enhanced Protection for Cultural Properties.

### 2. IMPACT OF GI-CERTIFIED PRODUCTS

#### Context:

**NABARD** has initiated a study to evaluate the **impact of Geographical Indication (GI)** products.

- This study aims to **assess the benefits received by artisans and producers due to GI tags**.

In India, GI registration is governed by the **Geographical Indications of Goods (Registration and Protection) Act of 1999**.

Administered by the **Registrar of Geographical Indications (RGI)**, it identifies agricultural, natural, or manufactured goods, providing legal protection for 10 years, renewable.

### 3. RAJA RAVI VARMA

#### Context:

On the occasion of **Raja Ravi Varma's 176th birth anniversary celebrations**, the **first true copy of his painting "Indulekha"** was unveiled at **Kilimanoor Palace, Kerala - where the artist was born**.

- The oil painting portrays **Indulekha holding a letter addressed to her lover, Madhavan**, dated **1892**, and **has been recently restored**.

#### About Raja Ravi Varma:

- Raja Ravi Varma (1848 - 1906)** was an **Indian painter and artist** who is known for his work that combines **European academic art with Indian iconography**.
- His work is **considered one of the best examples of this fusion**. Varma is sometimes called **the first modern Indian artist**.

- Varma's works are known for **combining Hindu mythological subject matter with European realist historicist painting style**.
- Some of his works include **Shakuntala, Woman Holding a Fruit, and Hamsa Damayanti**.

### 4. KUTCH AJRAKH GI TAG

#### Context:

The traditional artisans of **'Kutch Ajrakh'** from **Gujarat's vibrant region** of Kutch have been granted the **Geographical Indication (GI) certificate** by the **Office of the Controller General of Patents, Designs, and Trademarks (CGPDTM)**.

#### About Kutch Ajrakh:

It is a **traditional textile craft** of Gujarat, particularly in regions like Sindh, Barmer, and Kutch. It involves meticulous **hand-block printing on treated cotton cloth**, resulting in intricate designs rich in symbolism and history. The name **"Ajrakh"** derives from **'Azrak'**, meaning indigo, a key dye used in the process. Traditionally, Ajrakh prints **feature blue, red, and white colours** representing the sky, land/fire, and stars, respectively.

Introduced over 400 years ago by Sind Muslims, Ajrakh is commonly worn by nomadic pastoralist and agricultural communities such as the **Rabaris, Maldharis, and Ahirs**, in various forms like turbans, lungis, or stoles.



### 5. UNESCO'S MEMORY OF THE WORLD ASIA-PACIFIC REGIONAL REGISTER

#### Context:

The **Ramcharitmanas, Panchatantra, and Sahrdayaloka-Lo-cana** have been added to **UNESCO's Memory of the World Asia-Pacific Regional Register**, celebrating India's rich literary heritage and cultural legacy.

Literary Work	Author	Description
Ramcharitmanas (Awadhi)	<a href="#">Goswami Tulsidas</a>	An epic poem consisting of seven Kāndas; a poetic retelling of the Ramayana.
Panchatantra (Sanskrit)	Pt. Vishnu Sharma	One of the oldest collections of Indian fables, consisting of five parts with a 'story within a story' structure.
Sahridayāloka-Lo-cana (Sanskrit)	Acharya Anand-wardhan	A text on Indian poetics with commentary by philosopher Abinava Gupta.

**About UNESCO’s Memory of the World Asia-Pacific Regional Register:**

- Launched in 1992.
- It consists of three Registers namely, **International, Regional and National Register**.
- International Register consists of **several Indian entries namely Tamil Medical Manuscript Collection, Saiva manuscripts Rig Veda etc.**

## 6. 2024 INTERNATIONAL BOOKER PRIZE

**Context:**

Jenny Erpenbeck’s **novel “Kairos” wins the 2024 International Booker Prize**, depicting a **complex love story amidst East Germany’s final years**.

Set against the backdrop of the **Berlin Wall’s fall**, it explores personal and national transformations.

**About the International Booker Prize (formerly known as the Man Booker International Prize):**

It is awarded annually to recognize the **finest translated work of fiction worldwide**. **Established in 2005**, it encourages reading diverse fiction and has impacted reading habits in the UK. Eligible works must be **long-form fiction originally written in any language** but translated into English. The £50,000 prize is equally split between the author and translator, with short-listed candidates receiving £2,500 each.

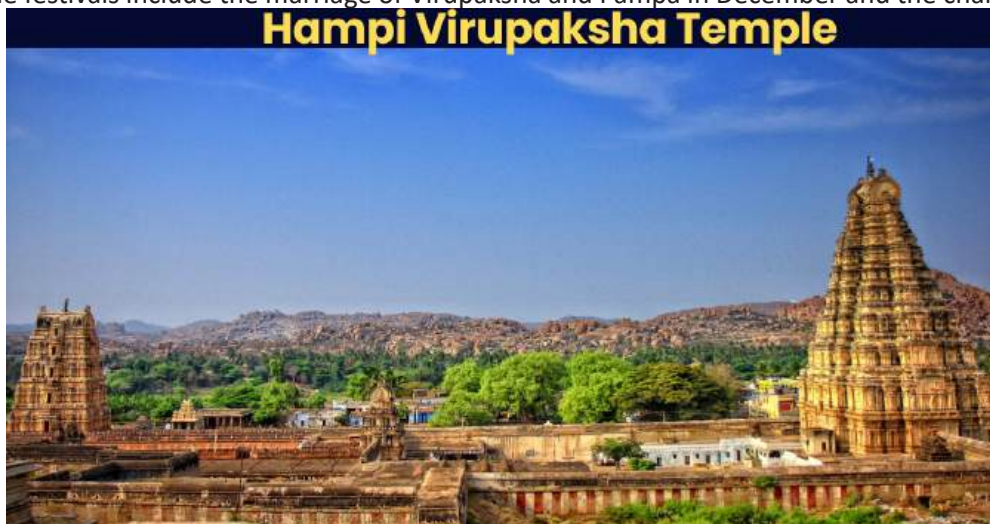
## 7. HAMPPI’S VIRUPAKSHA TEMPLE

**Context:**

A portion of **Hampi’s Virupaksha temple collapsed** due to heavy rains.

**About the Temple:**

The **Virupaksha Temple in Hampi**, dedicated to **Lord Virupaksha (a form of Shiva)**, is a **UNESCO World Heritage Site** in Karnataka. Constructed by **Lakkan Dandeha** under **Prauda Deva Raya** of the Vijayanagara Empire, it’s one of India’s oldest temples, dating back to the **7th century**. The temple features **intricate Dravidian architecture** with a nine-tiered entrance gate and mathematical patterns. It has survived through the **Chalukyan and Hoysala periods**, despite damage during Mughal rule. Notable festivals include the marriage of Virupaksha and Pampa in December and the chariot festival in February.



## 8. ANCIENT ROCK PAINTINGS

### Context:

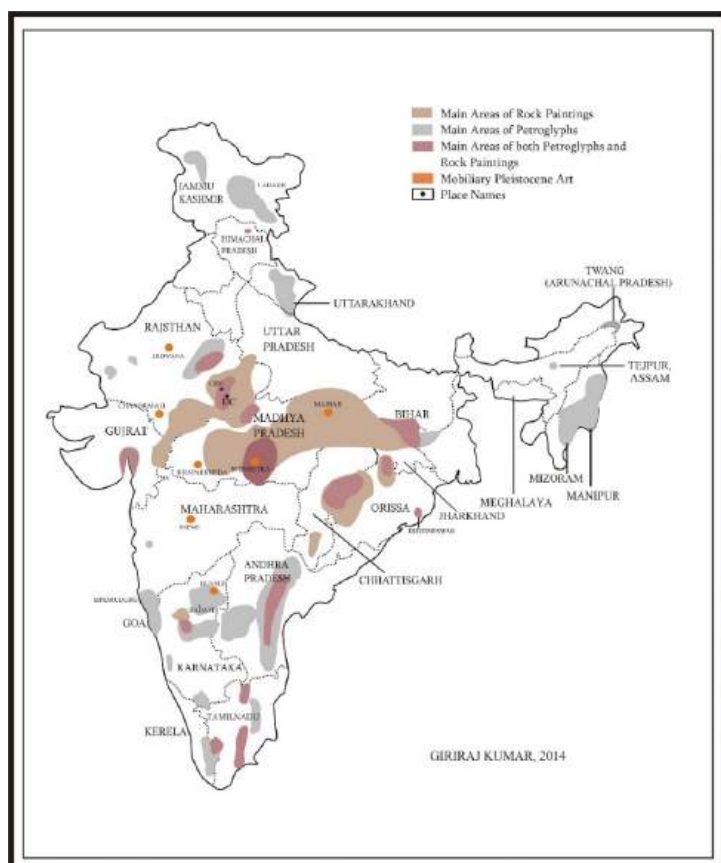
In Mauvi village, Goa, rock carvings dating back to the Neolithic age were confirmed by the Archaeological Survey of India (ASI).

### More about the News:

Rock carvings, including depictions of **zebus, bulls, and antelopes** alongside footprints and cupules, were discovered on a metabasalt rock along the dry riverbed of the **Zarme River**.

These carvings represent **prehistoric art in India**, spanning various periods:

1. **Upper Palaeolithic Period:** Earliest paintings, such as linear representations of animals like bison, elephants, and tigers, **alongside stick-like human figures**, found at sites like **Bhimbetka and Jwalapuram**.
2. **Mesolithic Period:** Predominantly depicting human scenes of hunting and community dances, with animals painted in a naturalistic style and humans in a stylistic manner. Major sites include **Pachmarhi and Adamgarh Hills**.
3. **Neolithic-Chalcolithic Period:** Characterized by **pottery and metal tools** depicted in rock paintings, with predominant colours of white and red possibly made from grinding haematite and limestone. Men are portrayed as **adventurous, and animals appear youthful and majestic**. Notable sites include the **Chambal region and Daimabad in Maharashtra**.



### History

## 9. HICKY'S BENGAL GAZETTE

### Context:

On World Press Freedom Day (May 3), India remembers Hicky's Bengal Gazette, the country's first newspaper.

**Launched in 1780 by James Augustus Hicky in Kolkata**, it highlighted government corruption and civic issues but faced closure due to lawsuits. It was a **weekly English-language publication** that faced closure in 1782 after criticizing **Governor General Warren Hastings**.

Despite its short lifespan, it **paved the way for journalism in India**, inspiring future publications and promoting freedom of the press.

## 10. SAHUL

### Context:

Recent archaeological findings have revealed an **ancient, Atlantis-like supercontinent named Sahul**, which facilitated **human migration from Asia to Australia around 70,000 years ago**.

- This landmass was **exposed during the last ice age due to lower sea levels** and **connected present-day Australia, Papua New Guinea, and Tasmania**.
- Researchers discovered Sahul through **simulations based on geological and environmental data**, which outlined **potential migration routes and archaeological sites** from **75,000 to 35,000 years ago**.

## 11. WAS THE STONE AGE ACTUALLY THE AGE OF WOOD?

### Context:

New research suggests that the **Stone Age, known for stone tools**, might also be termed the **"Wood Age"** due to advanced woodworking.

A study of **300,000-400,000-year-old wooden artefacts** from Schöningen, Germany, reveals that these tools required significant skill and precision. The study identified 187 wooden artifacts showing varied woodworking techniques.

The Stone Age, lasting from 3.4 million years ago to around 6,000-4,000 years BP, is traditionally divided into the **Palaeolithic, Mesolithic, and Neolithic periods**, characterized by **stone tool use and a hunter-gatherer lifestyle** transitioning to settled agriculture.

Period	Time Frame	Characteristics
<a href="#">Paleolithic Age</a>	500,000 – 10,000 BCE	Divided into three phases:
		<b>Early/Lower Palaeolithic</b> (500,000 B.C. – 50,000 B.C.): Hand-axes, cleavers, choppers.
		<b>Middle Palaeolithic</b> (50,000 B.C. – 40,000 B.C.): Flakes, points, scrapers.
		<b>Upper Palaeolithic</b> (40,000 B.C. – 10,000 B.C.): Blades, borers, advanced tools.
<a href="#">Mesolithic Age</a>	10,000 – 6000 BCE	Transitional phase between Paleolithic and Neolithic; hunting, fishing, food gathering, and early domestication of animals.
<a href="#">Neolithic Age</a>	6000 – 1000 BCE	Polished stone tools, stone axes; development of early agriculture and animal domestication.

[Society](#)

### 13. MURIA TRIBE

**Context:**

Muria tribal farmer practices the **traditional ‘deda’ seed preservation method**, handed down by his ancestors.

This eco-friendly technique involves **storing seeds in leaves, packed nearly airtight to resemble boulders**, providing multi-layer protection from pests and worms. Each ‘deda’ **supports up to 5kg of seeds and can preserve them for up to five years**. The method, used for pulses like green gram and red gram, ensures food security for Muria families settled in the Godavari valley, who migrated from Chhattisgarh due to conflict.

**About the Murias Tribe:**

**They are a sub-group of the Gond tribe**, primarily residing in **Chhattisgarh, India**. They are known for their involvement in the **Muria Rebellion of Bastar in 1876**, which was a revolt against **Gopinath Kapardas, the diwan of Bastar**. The Murias have unique customs, including the practice of **burying the dead in structures called “Gudi,”** where a stone is placed 6 to 7 feet high. Additionally, they have a social institution **known as “Ghotul,”** where young boys and girls have the freedom to choose their own life partners.

[Geography](#)

### 14. BATAGAY CRATER (PERMAFROST)

**Context:**

Siberia’s “gateway to the underworld,” the Batagay crater, is expanding at an alarming rate of **35 million cubic feet (1 million cubic meters)** annually due to permafrost thaw.

**What is Batagaika Crater?**

**Located in Russia’s Far East is the world’s largest permafrost crater**, formed by melting permafrost dating back to the **Quaternary Ice Age**. It began to form in the 1960s when surrounding forest clearance triggered permafrost thaw, causing the land to sink. However, thawing permafrost poses environmental risks, as the release of organic carbon into the atmosphere could exacerbate global warming.

**Permafrost is permanently frozen ground** that remains below the freezing point of water for two or more consecutive years. It is typically found in polar regions, such as the Arctic and Antarctic, as well as in high-altitude mountainous areas.

### 15. BASEFLOW IN RIVERS

### 12. VIVEKANANDA ROCK MEMORIAL

**Context:**

PM will meditate at Tamil Nadu’s Vivekananda Rock Memorial to mark the end of the Lok Sabha campaign.

**About Vivekananda Rock Memorial:**

1. Located on a **small island off Kanyakumari, Tamil Nadu, 500 meters** from Vavathurai.
2. **Surrounded by the Laccadive Sea** where the Bay of Bengal, Indian Ocean, and Arabian Sea meet.
3. **Built in 1970 to honour Swami Vivekananda**, who attained enlightenment on the rock.
4. Includes the **‘Shripada Mandapam’ and ‘Vivekananda Mandapam’**.
5. Features a **life-sized bronze statue of Swami Vivekananda**.
6. Funded by both State and Central Governments.

**Who was Swami Vivekananda?**

**Swami Vivekananda (1863–1902), born** Narendranath Datta, was a Hindu monk and a celebrated spiritual leader. A disciple of **Sri Ramakrishna**, he was known for his teachings on **Vedanta, the four yogas**, and the harmony of religions. He emphasized combining **Indian spirituality with Western progress** and believed in self-purification through helping others. He represented **Hinduism at the 1893 World’s Parliament of Religions** in Chicago and founded the Ramakrishna Order in 1897.

**Context:**

A recent study (on [six major river basins: Narmada, Tapi, Mahanadi, Godavari, Krishna, and Cauvery](#)) delving **into heavy rainfall, baseflow, and river floods in Peninsular India** sheds light on the factors driving flooding in the region.

**What is Baseflow?**

Baseflow refers to the **sustained flow of water in a river that originates from groundwater seepage into the river channel**. It represents the portion of river discharge that is sustained between rainfall events and is typically fed by groundwater stored in the saturated zone.

**Co-relation between baseflow and river flood:**

During flood events, when rainfall increases river flow, the presence of high baseflow levels can amplify flood magnitudes. This is because higher baseflow indicates wetter conditions, making the catchment more prone to rapid runoff during heavy rainfall.

## 16. FRESHWATER UNDER THE OCEAN BED

**Context:**

Freshwater exploration from **under the ocean bed is gaining attention** as a potential solution to depleting freshwater resources. Recent discoveries have revealed **significant freshwater reservoirs under the ocean**.

**How freshwater are formed under the ocean bed?**

- Subterranean Flow:** Rainwater and surface water can seep into the ground and percolate deep into the Earth’s crust. Some of this water can accumulate in underground reservoirs or aquifers beneath the ocean floor.
- Geological Processes:** Geological activities such as tectonic movements and volcanic eruptions can create fractures, faults, and cavities in the Earth’s crust. These geological features can trap freshwater, preventing it from mixing with seawater.
- Submarine Springs:** Submarine springs are underwater vents that release freshwater into the ocean. These springs can occur where groundwater from aquifers beneath the ocean floor discharges through openings in the seafloor.
- Glacial Melting:** During periods of glaciation, large ice sheets store vast amounts of freshwater. As glaciers melt, freshwater can be released into the ocean, forming layers of less dense water that float on the denser seawater below.

**Freshwater reserves, like the river found at the bottom of the Black Sea**, are crucial. With only **2.5% of Earth’s water being freshwater**, these reserves are vital. Most freshwater is in ice or underground, including under the ocean.

International laws, like [UNCLOS](#), govern ocean resources, defining rights and responsibilities. UNCLOS regulates resources like minerals, raising questions about freshwater classification. **Exclusive Economic Zones (EEZs)** grant states rights over marine resources, while the “Area” beyond EEZs is collectively governed. The [1958 Geneva Conventions](#) also addressed ocean law but were less comprehensive.

## 17. GEOMAGNETIC STORMS

**Context:**

Stunning aurora displays illuminated the night sky during the strongest G-5 level **geomagnetic storm in 21 years**, producing green and blue hues across the Northern Hemisphere.

**What are Geomagnetic storms?**

They occur when events like **solar flares emit higher-than-normal levels of radiation** toward Earth, interacting with its magnetic field. These disturbances, driven by **solar coronal mass ejections (CMEs)** or high-speed streams of solar wind from coronal holes, lead to geomagnetic storms.

Effects of such storms range from **the appearance of auroras to disruptions in communication** systems due to high radiation, making communication on Earth challenging.

These storms are classified on a scale measuring their effects. **At G1**, there are weak fluctuations in power grids and minor impacts on satellite operations, with auroras visible. **At G5, voltage control problems and grid system** collapse occur, radio waves are disrupted for days, and auroras can be seen at lower latitudes.

## 18. NOR’WESTERS

**Context:**

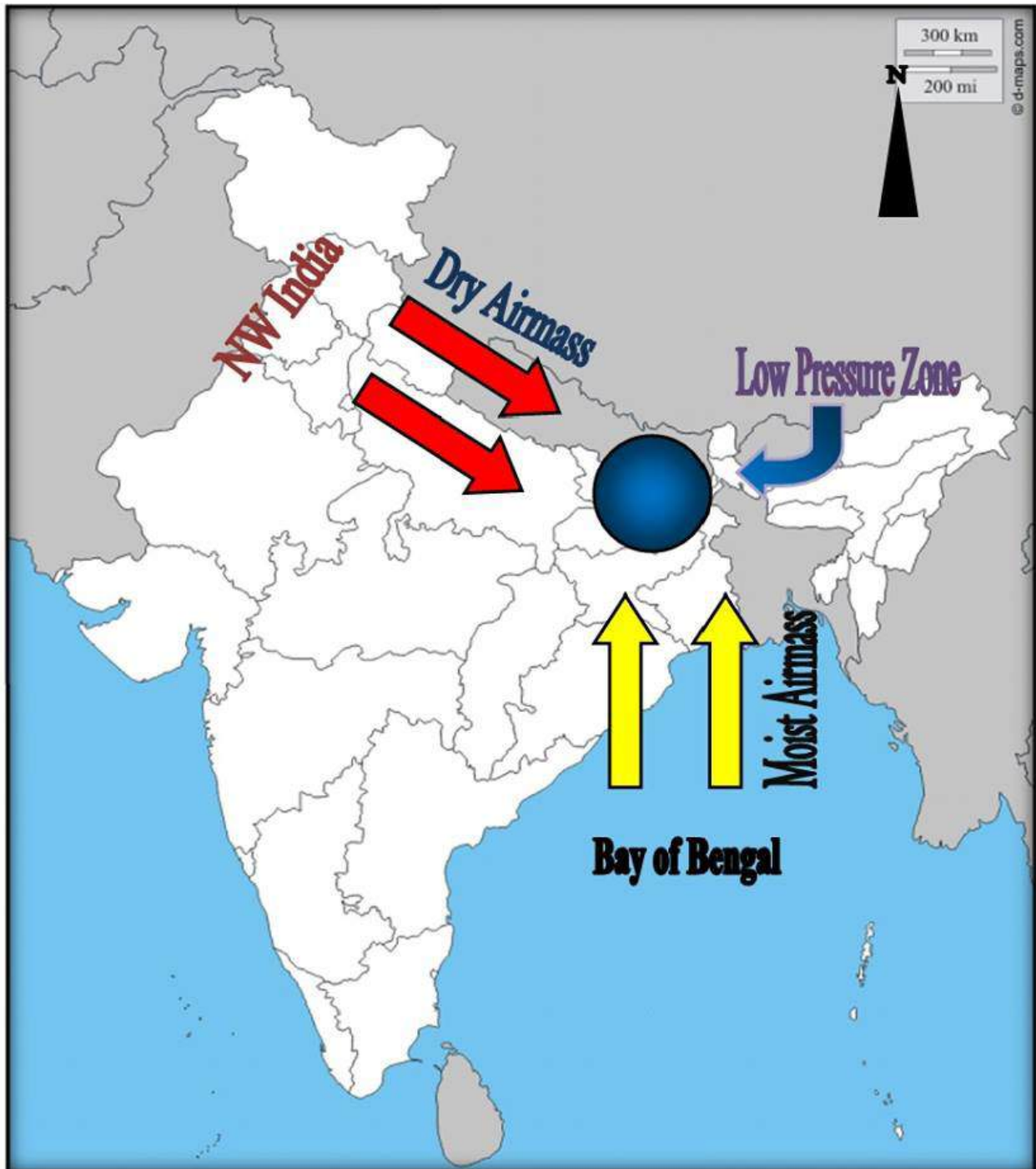
India is establishing **its first research testbed** to study **severe thunderstorms known as Nor’westers**, primarily affecting the **eastern and northeastern regions**.

- It is a collaboration between **the India Meteorological Department (IMD), the Indian Institute of Tropical Meteorology (IITM), Pune, and the National Centre for Medium-Range Weather Forecasting (NCMRWF), Delhi**.
- The testbed aims to **improve the accuracy and lead time of thunderstorm predictions and warnings**, which currently have a three-hour lead time.

About Nor’westers are **severe thunderstorms** that occur during the **pre-monsoon season (March to May) in Bangladesh and the Indian states of Bihar, Jharkhand, Odisha, Tripura, Assam, and West Bengal**. They are also known as **Kalbaisakhis in India and bordoisilas in Assam**.

**Formation:** The warm, moist, southerly low-level flow from the Bay of Bengal and a cool, dry westerly or NW upper-level flow existing over the region gives rise to a favourable synop-

tic setting for the formation of Nor'westers.



## 19. EARTH'S MAGNETIC FIELD

### Context:

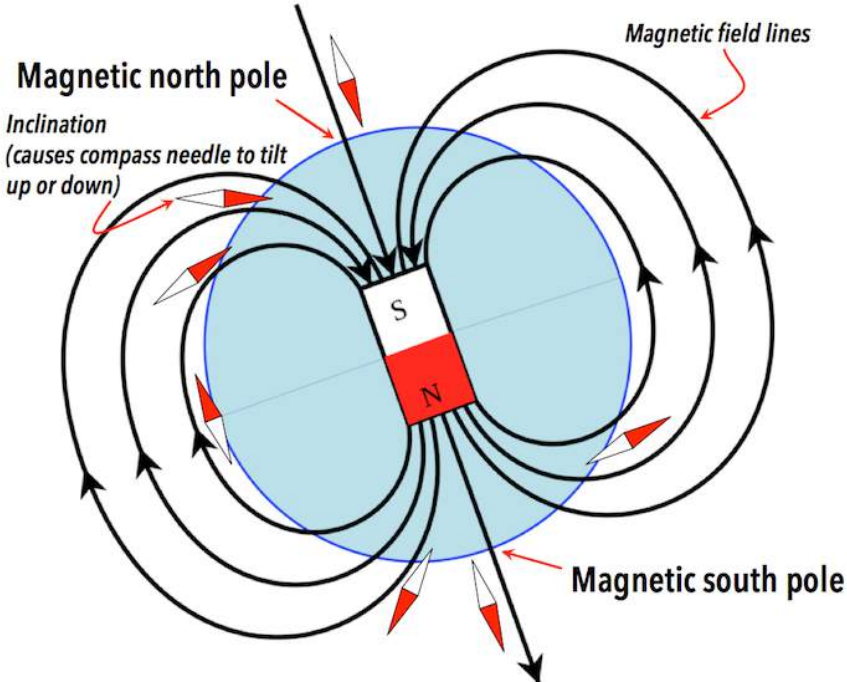
About 600 million years ago, Earth's magnetic field weakened significantly, allowing more solar radiation to reach the planet.

### Impact:

The weakening magnetic field **exposed the atmosphere to solar radiation**, releasing free oxygen atoms that facilitated the emergence of early life forms. It coincided with the **Ediacaran Period** (about 635 million to 541 million years ago), during which **multicellular organisms evolved due to increased oxygen levels** in the atmosphere and oceans.

This research challenges previous theories about the origin of oxygen and suggests that multiple factors contributed to its accumulation.

**About Earth's Magnetic Field:**

Earth's Magnetic Field	Description
<p><b>About</b></p>	<p><a href="#">Earth's magnetic field</a> (or geomagnetic field) is generated in the planet's interior and extends into space, creating a region called the <b>magnetosphere and interacting with the solar wind</b>. The magnetic field is generated by <b>convection currents of molten iron and nickel</b> in the Earth's core (also called the <b>geodynamo process</b>), which carry charged particles and generate magnetic fields. Earth's magnetic field is <b>generated by the outer core</b>.</p>
	<p>Not only Earth, but <b>Jupiter, Saturn, Uranus, and Neptune</b> also have strong magnetic fields, which are not fully understood. <b>Mars lacks the inner heat and liquid interior</b> needed for a magnetic field, while <b>Venus has a liquid core but spins too slowly</b> to generate one.</p>  <p>The diagram illustrates Earth's magnetic field. It shows a central bar magnet with a red 'N' (North) pole and a white 'S' (South) pole. Black lines with arrows represent the magnetic field lines, which emerge from the North pole and loop back to the South pole. Several red compass needles are shown at different latitudes, with their needles tilted relative to the vertical. A label 'Inclination (causes compass needle to tilt up or down)' points to one of these tilted needles. The Earth's surface is shown as a blue circle, and the magnetic poles are labeled 'Magnetic north pole' and 'Magnetic south pole'. The field lines are labeled 'Magnetic field lines'.</p>
<p><b>Magnetic Poles</b></p>	<p>Earth has two sets of poles: the <b>geographic poles and the magnetic poles</b>. The geographic North and South poles are the locations where the lines of longitude converge, with the Geographic North Pole situated in the middle of the Arctic Ocean and the Geographic South Pole located in Antarctica. In contrast, the <b>magnetic poles are the locations where the magnetic field lines enter and exit the Earth's surface</b>. The Magnetic North Pole, also known as the <b>North Dip Pole</b>, is currently found on <b>Ellesmere Island in northern Canada</b>.</p>
<p><b>Magnetic Pole reversal</b></p>	<p>The forces that generate Earth's magnetic field are constantly changing, causing changes in the strength of the magnetic field. This causes the <b>location of Earth's magnetic north and south poles to gradually shift</b>, and to even completely flip locations around <b>every 300,000 years</b>. During a pole reversal, the magnetic field weakens but doesn't completely disappear.</p>
<p><b>Magnetic Field's Life-time</b></p>	<p>Previous studies suggested a magnetic field on Earth at <b>least 3.5 billion years</b> old, but a recent study has extended its lifetime by another 200 million years. <b>Using uranium-to-lead ratio analysis</b>, researchers estimated that some of the magnetised minerals in the rocks were approximately <b>3.7 billion years old</b>.</p>
<p><b>Potential Role in Earth's Habitability</b></p>	<p>The early magnetic field may have played a <b>critical role in making the planet habitable</b>. It likely helped retain a life-sustaining atmosphere and shielded the planet from damaging solar radiation.</p>

**20. TURBULENCE**

**Context:**

**A recent Singapore Airlines flight** encountered severe mid-air turbulence, a type called **Clear-air turbulence**, caused by wind shear.

**What is Wind shear?**

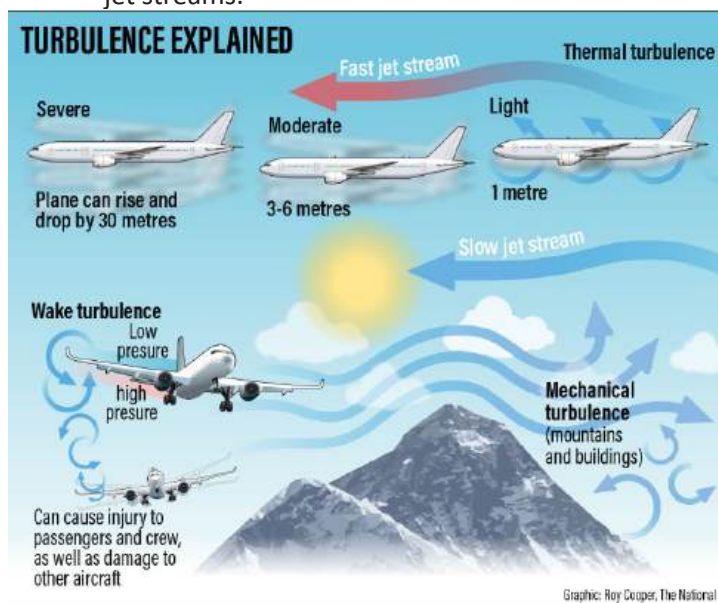
**It is the change in wind speed or direction** over a distance, occurring horizontally or vertically at various altitudes. It's commonly associated with weather phenomena like jet streams, mountain waves, or thunderstorms.

**What is Turbulence?**

Turbulence is the **irregular motion of air** that can occur during flight. It manifests as sudden, unpredictable changes in airflow, causing the aircraft to experience shaking or bouncing movements.

**Turbulence occurs in aircraft due to various factors, including:**

- 1. Atmospheric Conditions:** Turbulence can be caused by disturbances in the atmosphere, such as wind shear, jet streams, thermal convection, or mountain waves.
- 2. Weather Systems:** Thunderstorms, frontal boundaries, and other weather systems can create turbulent conditions as aircraft encounter changes in air pressure, temperature, and moisture.
- 3. Terrain Effects:** Near mountains or large land masses, aircraft may experience turbulence caused by the interaction of air masses with terrain features.
- 4. Wake Turbulence:** Aircraft generate wake turbulence, or vortices, as they move through the air. Following aircraft can encounter these vortices, leading to turbulence.
- 5. Clear-Air Turbulence:** This type of turbulence occurs in clear air and is often associated with changes in wind speed and direction at high altitudes, such as jet streams.



**21. HEAT INDEX**

**Context:**

The mercury in Delhi **reached 41°C recently**, but with high humidity, the heat index soared to a blistering 50°C.

IMD now **measures the heat index, factoring in both temperature and humidity**, providing a more accurate sense of discomfort. Expectations are for the index to hit 54-56°C in the next 48 hours.

**Heat Index (HI):**

Launched by the India Meteorological Department (IMD) on an **experimental basis**. Also known as **Apparent Temperature**, it reflects what the temperature feels like to the human body when relative humidity is combined with the air temperature. It provides information **about the impact of humidity on high temperatures** and serves as an indicator of human discomfort.

**Color codes used for HI:**

- 1. Green:** HI less than 35°C
- 2. Yellow:** HI between 36-45°C
- 3. Orange:** HI between 46-55°C
- 4. Red:** HI greater than 55°C

**22. VOLCANOES ON VENUS: FRESH LAVA FLOWS DETECTED**

**Context:**

Radar footage has revealed **fresh lava flows on Venus**, indicating active volcanoes.

Researchers from Italy's International Research School of Planetary Sciences compared recent images with those **from the 1990-1992 Magellan spacecraft**, confirming new rock formations. These findings suggest **Venus is more volcanic than previously thought**, with active flows identified in the regions of **Sif Mons and Niobe Planitia**.

**About Magellan Mission**

Launched by **NASA in 1989**, the **Magellan mission was the first spacecraft** to image the entire surface of Venus. It used **Synthetic Aperture Radar (SAR)** to create high-resolution maps, revealing signs of volcanism, tectonic activity, and turbulent surface winds on Venus.

GS-2

Salient features of Indian Constitution & Functioning

**23. REPORTS/STUDY IN NEWS**

Reports/Study	Details
<a href="#">World Press Freedom Index (WPFI) 2024</a>	India ranked <b>159 out of 180 countries</b> in the annual WPFI 2024, released by <b>Reporters Without Borders (RSF)</b> , a Paris-based NGO advocating for freedom of information.
	Published on <b>World Press Freedom Day (May 3)</b> with the theme <i>“A Press for the Planet: Journalism in the Face of the Environmental Crisis”</i> . Top 3 ranked countries: Norway, Denmark, and Sweden
	<b>Indicators:</b> Based on five indicators: Political, Economic, Legislative, Social, and Security.
<a href="#">CEEW study: Coal’s Share in India’s Electricity Capacity</a>	For the first time, <b>coal’s share in India’s total electricity capacity fell below 50%</b> . A study by CEEW revealed India achieved a total installed capacity of <b>442 GW in 2024, with over 71%</b> of net power generation capacity added contributed by renewable energy sources, particularly solar energy.
	Despite declines in share, net coal capacity addition increased four times compared to FY23

**24. ARTICLE 31C**

**Context:**

The Supreme Court is hearing a **case regarding Chapter VIII-A** of the **Maharashtra Housing and Area Development Act, 1976**. This chapter allows the government to **acquire dilapidated buildings in Mumbai to distribute resources for the common good, citing Article 39(b)**.

- The debate revolves around **whether private property can be considered a ‘material resource of the community’ under Article 39(b), and if Article 31C still holds validity after the Minerva Mills judgment of 1980.**

[Article 31C](#) of the Indian Constitution protects laws enacted to **distribute material resources of the community for the common good, as outlined in Article 39(b) and (c)**.

These **laws cannot be challenged on the grounds of violating rights under Article 14 (right to equality) or Article 19 (freedom of speech, assembly, etc.)**.

**25. RIGHT TO PEACEFUL DEATH**

**Context:**

The **article** contrasts end-of-life care in India and the West, emphasizing the need for a dignified passing for all. It calls for a rational system to ensure peaceful deaths and highlights **the Right to Peaceful Death**

**What is the Right to Peaceful Death?**

The Right to Peaceful Death refers to the **right of individuals to pass away with dignity and without unnecessary suffering**. It is **not explicitly mentioned** in the Indian Constitution. However, the Supreme Court of India has recognized the **right to die with dignity as a fundamental aspect of the right to life under Article 21**. This recognition came in the landmark case of **Common Cause (A Regd. Society) v. Union of India (2018)**, where the court upheld the legality of passive euthanasia and the right to make advance directives for medical treatment.

**26. ARTICLE 39(B) OF THE CONSTITUTION**

**Context:** The Supreme Court has reserved its verdict on **whether private properties can be considered ‘material resources of the community’ under Article 39(b) of the Constitution**.

**About the case:**

The case stems from petitions, including **one by the Mumbai-based Property Owners' Association**, challenging provisions in the **Maharashtra Housing and Area Development Authority Act**. The verdict's implications could shape the **balance between individual rights and societal welfare in property ownership and distribution**.

**About Article 39(b):**

**Article 39(b)** directs the **state to distribute material resources** for the common good, while **Article 31C** empowers the state to take over such resources. Additionally, **Article 39(c)** aims to **prevent wealth concentration**.

Constitutional and Non- Constitutional Bodies

## 27. REPOLLING IN AN ELECTION

**Context:**

The Election Commission of India has **ordered repolling in six booths of the Outer Manipur constituency** due to reported disturbances during the Lok Sabha election's second phase.

**Provisions under the Representation of the People Act (RPA), 1951, for re-polling:**

Provision	Circumstances for Re-polling
<b>Section 57</b>	Natural calamity, violence, etc.
<b>Section 58(2)</b>	Damage or destruction of voting machines
	Countermanding of the election due to booth capturing
<b>Section 52</b>	Death of a candidate from a recognized political party

## 28. ELECTION RIGHTS OF PRISONERS

**Context:**

Accused persons in prison can contest polls but are barred from voting. The legal status distinguishes between the right to vote and the right to be elected.

**Why can accused persons in prison contest polls but not vote?**

Accused persons in prison can contest polls due to the **legal distinction between the right to vote and the right to be elected**. While they can seek election until convicted, they are barred from voting, as per the Representation of People Act, unless released on bail or acquitted.

**The difference between the Right to Vote and the Right to be Elected**

<u>Right to Vote</u>	<u>Right to Be Elected</u>
Statutory right, not fundamental	Statutory right, not fundamental
Can be regulated by Parliament	Can be regulated by Parliament
Citizens exercise the right to choose. However, Those confined in prison cannot vote ( <b>Section 62(5) of the RPA, 1951</b> ), under sentence of <b>imprisonment, transportation</b> , or in lawful police custody.	Citizens exercise the right to stand for election. However, Convicted individuals sentenced to 2 years imprisonment cannot contest elections ( <b>Section 8(3) of the RPA, 1951</b> )
<b>Preventive detainees have the right to vote</b> (Section 62(5) of the RPA, 1951 and Rule 18 of Conduct of Elections Rules 1961)	<b>Even if on bail</b> , convicted persons cannot contest.
Allows citizens to participate in elections	Allows citizens to be candidates in elections
Subject to statutory limitations	Subject to statutory limitations
Can be revoked or restricted by law	Can be revoked or restricted by law
Ensures representation in governance	Enables individuals to represent constituents

## 29. DE-RECOGNITION OR DE-REGISTRATION OF POLITICAL PARTIES

**Context:**

ECI lacks **explicit powers to de-register parties** for non-participation in elections. The Supreme Court has ruled that **de-registration can only occur under exceptional circumstances.**

<b>Derecognition of Political Parties</b>	<b>Definition:</b> Withdrawal of recognition by ECI, relegating parties to registered-unrecognized status.
	<b>ECI's Power:</b> Derecognition for violating constitutional provisions or the Representation of the People Act, 1951.
	<b>Grounds for National Party Derecognition</b>
	Failure to secure <b>6% of total votes in LS/ State LA or 4 MPs in LS elections</b>
	Failure to secure at least <b>2% of seats in LS from 3 states</b>
	Failure to secure <b>8% of total valid votes</b> in state elections or LS elections from the state
<b>Deregistration of Political Parties</b>	<b>Definition:</b> Cancellation of party registration; ECI lacks authority to deregister parties
	<b>Effects:</b> Deregistered parties cannot contest elections.
	<b>Grounds for Deregistration:</b>
	Registration was obtained by <b>fraud</b> .
	Declaration of <b>illegality</b> by Central Government.
	<b>Amendment of internal constitution</b> conflicting with the Indian Constitution.
As per the ECI, there are <b>2,790 active registered political parties</b> in India (as of May 2024). <b>Section 29A of the Representation of the People Act, 1951 (RP Act)</b> sets out the criteria for political party registration with the Election Commission of India (ECI). However, the RPA lacks <b>provisions for deregistration</b> . Despite this, the ECI has consistently <b>advocated for authority over both registration and deregistration</b> processes for political parties.	

## 30. USE OF STATE-FUNDED MEDIA DURING POLLS

**Context:**

Recent incidents involving Sitaram Yechury and G Devarajan, where changes were made to their speeches aired on Doordarshan and AIR, have sparked controversy

**About the use of state-funded media during polls:**

Aspect	Descriptions
<b>ECI's Allocation of Time</b>	Since 1998, <b>recognised political parties</b> have been allowed to freely use state-owned television and radio during polls.
	The <b>ECI determines the time allotted</b> to each recognised national and state party before the election campaign begins.
	<b>National Parties:</b>
	- 10 hours of telecasting time on Doordarshan's national channel - At least 15 hours on its regional channels - 15 hours of airing on regional AIR stations - 10 hours on the national AIR
	<b>State Parties:</b>
	- At least 30 hours of telecasting time on the appropriate regional Doordarshan channel - AIR radio station
<b>Time Allotted for 2024 Elections:</b>	- For national parties: <b>4.5 hours</b> (45 minutes each) on Doordarshan and AIR
	- Remaining <b>5.5 hours</b> allocated based on vote share in 2019 Lok Sabha elections
	- Similar formulae followed for state parties

<b>ECI's Guidelines on Speech Contents</b>	Parties and speakers are <b>expected to submit transcripts of speeches three to four days</b> before recording.
	Transcripts must be approved by concerned authorities in respective AIR and Doordarshan stations.
	Forbidden Speech Content:
	Criticism of other countries; Attack on religions or communities; Obscenity or defamation; Incitement of violence; Contempt of court; Attacks against the integrity of the President and judiciary; Statements affecting the unity, sovereignty, and integrity of the nation; Criticism of individuals by name
<b>Concerns Raised by Opposition Leaders</b>	According to Sitaram Yechury, censorship applied to his text is a patent denial of the <b>right to dissent in a democracy</b> .

### 31. SPECIAL CATEGORIES OF VOTERS

Type of Voting	Description	Eligible Voters
<b>In-Person Voting</b>	Voters cast their ballots at designated polling stations on the specified election day using EVMs.	All registered voters.
<b>Postal Ballots</b>	Allows remote voting outside the polling station, without EVMs, before the designated poll date. <b>Postal Voting Centers (PVC):</b> Centers where essential service absentee voters can obtain and cast their postal ballots before the election day.	Special voters, Essential service workers (railways, telecom, health, media, etc.), voters on election duty, detainees, and certain absentee voters.
<b>Electronically Transmitted Postal Ballot System (ETPBS)</b>	Encrypted ballots are sent electronically to service voters, who return completed ballots by post.	Service voters (armed forces, paramilitary, government employees abroad).
<b>Home Voting</b>	Election teams visit homes of <b>85+ aged voters, PwD, and COVID-19-affected voters</b> to facilitate postal voting.	Voters aged 85+, persons with disabilities, COVID-19 affected voters.
<b>Election Duty Certificate (EDC)</b>	Allows election duty personnel to vote at their duty polling station within the same constituency.	Election duty personnel.
<b>Proxy Voting</b>	Service voters appoint a proxy to vote on their behalf at their designated polling station.	Armed and paramilitary forces (Classified Service Voters).
<b>Assisted Voting</b>	Allows a companion to assist a blind or disabled voter in casting their vote.	Voters with blindness or other disabilities.

### 32. NCBC RECOMMENDS INCREASING THE RESERVATION QUOTA FOR OBCS

**Context:** The National Commission for Backward Classes (NCBC) has recommended **increasing the reservation quota for Other Backward Classes (OBCs)** in public employment in Punjab and West Bengal.

Currently, **Punjab allocates 25% of public employment** positions to Scheduled Castes and 12% to OBCs, totalling 37% reservation. The NCBC has proposed enhancing the OBC quota by an **additional 13%**, bringing the total OBC reservation in public employment to 25%, adhering to the **Supreme Court's ceiling of up to 50% reservation for socially and educationally backward classes** (in the **Indra Sawhney case**).

In West Bengal, the reservation quota for Scheduled Castes, Scheduled Tribes, and Other Backward Classes is **22%, 6%, and 17%, respectively**, in government-run or aided establishments. The NCBC suggests increasing the OBC reservation to reach the **50% ceiling set by the Supreme Court**.

**About the National Commission for Backward Classes (NCBC):**

It was established as a statutory body under the **NCBC Act, 1993**, and was granted Constitutional Status through the **102nd Constitution Amendment Act, 2018**, with the insertion of **Article 338B**. The commission consists of a Chairperson, Vice-Chairperson, and three other Members in the rank and pay of **Secretary to the Government of India**. Its mandate includes investigating and monitoring all matters related to the safeguards provided for **socially and educationally backward classes**. Additionally, the NCBC advises the Central Government on **OBC inclusion/exclusion requests** from state or central governments. The commission **presents its report to the President annually** and at other times as it deems fit. If the Government disagrees with its recommendations, **it must record its reasons**.

### 33. FORM 17C

**Context:**

A **dispute has arisen over the Election Commission’s (EC) handling of voter turnout data, particularly related to Form 17C**.

- Form **17C records** detailed **polling data, including the number of votes cast and rejected at each booth**.
- The Commission maintained **there is no legal mandate for it to make public the total number of votes cast in each polling station**. It says copies of Form 17C are shared with the polling agents present **immediately upon the close of polling**.

**About Form 17C:**

The **Conduct of Election Rules, 1961** require the EC to maintain two forms- **Forms 17A and 17C**. Form **17A records the details of every voter** who enters a polling booth and casts their vote. **Form 17C contains the total number of votes cast**.

### 34. INSTITUTE OF CHARTERED ACCOUNTANTS OF INDIA (ICAI)

**Context:**

The Supreme Court upheld a **regulation by the Institute of Chartered Accountants of India (ICAI)**, limiting chartered accountants to accepting a maximum number of tax audit assignments per financial year.

**What is ICAI?**

The Institute of **Chartered Accountants of India (ICAI)** is a **statutory body** established under the Chartered Accountants Act, 1949, by the Indian Parliament to regulate the **chartered accountancy profession** in the country. It operates under the **Ministry of Corporate Affairs, Government of India**, with its headquarters in New Delhi. As the world’s **second-largest professional body** of chartered accountants, ICAI is governed by a **Council comprising elected and nominated members**. Its functions include regulating the profession, conducting examinations and education, providing continuing professional education, formulating accounting standards, ensuring ethical standards, and exercising disciplinary jurisdiction. Additionally, ICAI contributes input on policy matters to the government.

**About National Financial Regulatory Authority (NFRA):**

It is an Indian body established under the **Companies Act 2013** to enforce accounting and auditing standards, oversee auditor work, and recommend standards. It has the authority to investigate professional misconduct by chartered accountants or CA firms, impose penalties, and bar them **for up to 10 years**.

### 35. ARTICLE 329 (B)

**Context:**

The Supreme Court adjourned an application by the **Association for Democratic Reforms (ADR) seeking directions to the Election Commission (EC)** regarding the publication of voter turnout figures, citing **Article 329(b) of the Constitution**, which prohibits judicial intervention during elections.

**About Article 329(b):**

1. Article 329(b) of the Constitution, found in **Part XV alongside articles 324-329**, governs electoral matters.
2. **Article 324 grants** the Election Commission powers to oversee elections, while **Article 329 addresses** the judiciary’s role in electoral affairs.
3. **Article 329(a)** prohibits the judiciary from challenging laws regarding electoral district boundaries or seat allocation.
4. **Article 329(b)**, as amended by the Constitution (19th Amendment) Act, 1966, mandates that elections can only be questioned through an election petition presented according to laws made by the appropriate Legislature.
5. **The Representation of the People Act, 1951**, further establishes the authority of high courts to hear and decide on election petitions, with Supreme Court review possible.
6. In past rulings, the Supreme Court clarified that **“election” in Article 329(b)** encompasses the entire electoral process, from notification to result declaration.

ration, and barred judicial interference at intermediary stages.

handle legal matters concerning Hindu marriages and divorce, based on territorial jurisdiction.

### 36. ELECTION MANIFESTO

**Context:**

The Supreme Court ruled that **promises in a political party's manifesto** benefiting the public financially are not corrupt practices. This decision came from an appeal challenging the **election of B.Z. Zameer Ahmed Khan**, a Congress candidate, in the 2023 Karnataka Assembly election.

The petitioner argued that **such promises were corrupt, but the court found this view too "far-fetched,"** stating that policy commitments leading to financial benefits for the public are legitimate and not corrupt practices.

**What is an Election Manifesto?**

**An election manifesto is a published declaration** of a political party's intentions, views, policies, and programs, often released before elections to inform voters.

**What are Freebies?**

It refers to **goods and services like bicycles, smartphones, and bill waivers** offered by parties. Unlike subsidies, which are essential for governance, freebies aim to attract voters.

The Supreme Court, in the **2013 S Subramaniam Balaji vs Government of Tamil Nadu case**, noted that **unrealistic poll promises and freebies disrupt** fair elections but do not constitute corrupt practices under the law.

[Functioning of Parliament and State Legislatures](#)

### 37. HINDU MARRIAGE ACT

**Context:**

The Supreme Court clarified that **mere registration without a proper ceremony** doesn't constitute a valid marriage under the Hindu Marriage Act, **emphasizing marriage's sacredness and practice of 'Samskara'.**

**About the Hindu Marriage Act:**

The **Hindu Marriage Act (HMA) of 1955** regulates Hindu marriages and divorce within the Hindu community and applies to Hindus by birth or conversion, **as well as Buddhists, Jains, and Sikhs.** It sets the **minimum marriageable age at 21 for the groom and 18 for the bride**, prohibits bigamy and polygamy, recognizes customary practices, and considers mental health as a criterion for void marriage.

The Act allows for **marriage registration, permits divorce** through mutual consent or judicial separation, and includes provisions for restitution of conjugal rights. Family courts

### 38. DRAFT NEW EXPLOSIVES BILL

**Context:**

The government has proposed a **new Explosives Bill to replace the outdated Explosives Act of 1884.**

The bill is aimed at **regulating the manufacture, possession, use, sale, transport, import,** and export of explosives. It also aims to **increase fines for violations and streamline the licensing process for explosives** such as gunpowder and nitroglycerine.

**Key highlights of the bill include:**

- 1. Definition of explosives:** The bill defines explosives, including substances used to produce practical or pyrotechnic effects by explosion.
- 2. Licensing authority:** The Central Government will prescribe the authority competent to grant, suspend, or revoke licenses. Currently, the **Petroleum and Explosives Safety Organisation (PESO)** oversees these functions.
- 3. Punishment for contravention:** Violating the Act may result in imprisonment for up to three years, a fine of Rs 1,00,000, or both.
- 4. Power of Central Government:** The Central Government can make rules to carry out the provisions of the Act.

**About the PESO:**

The **Petroleum and Explosives Safety Organization (PESO) (est. 1898; HQ: Nagpur; under the Ministry of Commerce and Industry)**, was established during British rule as the **Department of Explosives.** It oversees the administration of various acts including the **Explosives Act, 1884, and the Petroleum (Production) Act, 1934.** PESO regulates the import, export, transport, storage, and usage of petroleum products, explosives, and flammable materials. It operates autonomously under the **Chief Controller of Explosives.** PESO frames rules and regulations for various sectors such as cinematography, gas cylinders, petroleum, and explosives. Its officers are selected through the Union Public Service Commission into the **Indian Petroleum and Explosives Safety Service cadre.**

### 39. SC ORDER ON UAPA

**Context:**

The Supreme Court declared that investigating agencies **must provide written grounds of arrest to individuals detained under the Unlawful Activities Prevention Act (UAPA),** affirming the **right to life and personal liberty** as sacrosanct.

**About the case:**

In the **Prabir Purkayastha v. State (NCT of Delhi)** case, the Supreme Court invalidated Newsclick founder **Prabir Purkayastha's arrest** under the Unlawful Activities (Prevention) Act (UAPA) due to the Delhi Police's failure to inform him of the **grounds of arrest** before taking him into custody. The court emphasized that the mandate was established in the **Pankaj Bansal v. Union of India & Ors. judgment**, which requires providing written grounds of arrest, applies to UAPA cases as well. This requirement is rooted in **Articles 22(1) and 22(5)** of the Indian Constitution, which protects the rights of arrested individuals to be informed of the reasons for their arrest and to make representations against detention.

The court emphasized the **importance of informing the arrested person to facilitate legal consultation**, oppose custody remand, and seek bail. It found no significant difference in the language of **Section 19(1) of the PMLA and Section 43B(1) of the UAPA**, stating that both require written communication of arrest grounds.

**Evolution of provisions of bail under UAPA by SC:**

- 2008:** The UAPA Amendment Act introduced Section 43D(5), shifting the burden onto the accused to prove accusations not prima facie true.
- 2016:** Angela Harish Sontakke v State of Maharashtra granted bail despite stringent provisions, considering extended custody and the need for balance.
- 2019: National Investigation Agency v Zahoor Ahmad Shah Watali** narrowed interpretation, making bail harder after charges by NIA.
- 2021:** Union of India v K.A. Najeeb highlighted the possibility of bail for prolonged incarceration violating Article 21 rights.
- State of NCT of Delhi v Devangana Kalita** separated evidence from NIA inferences, leading to bail based on NIA's failure to establish a prima facie case.
- 2023:** Vernon Gonsalves v State of Maharashtra diverged from Watali, emphasizing evidence analysis.

**About UAPA:**

The **Unlawful Activities (Prevention) Act (UAPA), 1967**, aims to prevent certain unlawful activities by individuals and associations, particularly those related to terrorism. **Section 43B(1) of the UAPA** mandates that any officer arresting a person under this act must inform the accused of the grounds for such arrest.

**40. SERVICES UNDER THE CONSUMER PROTECTION ACT**

**Context:**

The Supreme Court ruled that **lawyers cannot be sued under the Consumer Protection Act** for providing faulty service.

The Supreme Court **overturned the National Consumer Dis-**

**putes Redressal Commission's 2007 judgment**, stating that services provided by lawyers are not covered under the Consumer Protection Act (CPA) 1986 (re-enacted in 2019)

Justices Bela M Trivedi and Pankaj Mithal held that **lawyers' services must be treated differently as they involve factors beyond their control** and impact the entire justice delivery system. The court concluded that lawyer services do not fall under the purview of the Consumer Protection Act.

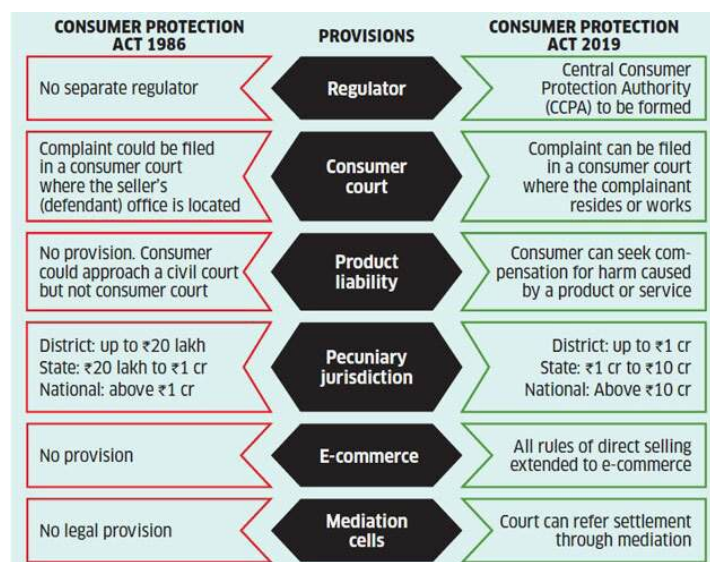
Additionally, the court suggested a review of **VP Shantna's (1995) judgment**, which held **doctors and medical professionals** liable under the CPA.

**About CPA:**

- Enacted in 1986 to protect consumer interests** and establish consumer protection councils for dispute resolution.
- Replaced by the CPA 2019**, which strengthened consumer protection provisions

**Key Features of CPA 2019:**

- Expanded the definition of **'consumer'** to include online or electronic purchases.
- Established the Central Consumer Protection Authority** to promote and enforce consumer rights.
- Enhanced dispute resolution mechanisms**, including mediation and e-filing of complaints.
- Introduced product liability** action against manufacturers and service providers.
- Implemented measures to prevent unfair trade practices** in e-commerce and direct selling sectors.



Government Policies

### 41. ADMINISTRATIVE ALLOCATION OF SPECTRUM

Why in the News?	The Supreme Court of India <b>rejected the Centre’s plea for administrative allocation of spectrum</b> , upholding the principle of open and transparent auction for spectrum allocation.
Why Did the Supreme Court Reject the Centre’s Application?	SC emphasized that <b>spectrum allocation to private players should adhere to open and transparent auctions</b> , as established by the <b>landmark 2G spectrum case</b> , to avoid favouritism and ensure fairness and transparency in the distribution of airwaves.
What is the Legal Framework Regarding Spectrum Allocation?	<b>Telecommunications Act, 2023</b> empowers the government to assign spectrum through administrative processes, excluding auction for entities in its <b>First Schedule</b> , such as those engaged in national security, defence, and law enforcement.
What is Spectrum?	The spectrum <b>comprises radio frequencies</b> used by wireless signals for communication, including mobile services like 2G, 3G, and 4G, divided into low, mid, and high bands, essential for various types of communication.
Spectrum Allocation Methods Across the Globe	New Zealand initiated <b>auctions for spectrum allocation in 1989</b> , followed by many countries. The US transitioned to <b>auctions in 1993</b> after cellular licence lotteries resulted in speculative applicants and losses. <b>Canada and the EU often use an administrative process rather than an auction</b>

### 42. EDUCATION IN MOTHER TONGUE

**Context:**

CBSE is advocating for **teaching children in their mother tongue or regional language** from an early age. In line with the **National Education Policy and National**

**Curriculum Framework (NCF) 2022**, they’ve introduced **52 primers in various local languages**. These primers, **developed by NCERT and IIL**, aim to facilitate language learning and numeracy skills among young learners.

**NEP 2020 advocates** for mother tongue education **until at least Grade 5**, preferably extending to Grade 8 and beyond. NCF 2022 has recommended that the **mother tongue should be the primary medium of instruction** for children **till eight years of age**.

**Education in the mother tongue is emphasized through various provisions and initiatives:**

- Article 350A:** Mandates states to provide primary education to linguistic minority groups in their mother tongue.
- Section 29 of the Right to Education Act, 2009:** Advocates for the medium of instruction to be in the mother tongue whenever possible.
- NISHTHA FLN:** Promotes teaching in mother tongue, regional language, and home language.
- 52 Entry-Level Primers:** Developed by NCERT and Indian Institute of Languages for teaching children in various mother tongues and local languages.
- International Mother Language Day:** Observed on 21st February, initiated by Bangladesh and recognized by UNESCO in 1999.
- Yuelu Proclamation by UNESCO:** Emphasizes the importance of preserving and promoting linguistic diversity.

Judiciary

### 43. SUPREME COURT BAR ASSOCIATION

**Context:**

The Supreme Court has **reserved one-third of the seats in the Supreme Court Bar Association’s executive committee for women**.

- This means at **least 3 out of 9 positions** in the committee and 2 of 6 senior executive member posts will be reserved for women.

**Status of women in the higher judiciary:**

Out of 268 judges ever appointed in the Supreme Court since independence, only 11 have been women. **Justice Fathima Beevi** was the first woman judge appointed to the Supreme Court in 1989. According to the **India Justice Report 2022**, women make up 35% of judges in subordinate courts but only 13% in High Courts. Additionally, only 15% of practising lawyers are women.

The **Supreme Court Bar Association (SCBA)** is an Indian bar association representing practising lawyers of the Supreme Court of India.

### 44. 'EGGSHELL SKULL' RULE

**Context:**

The Supreme Court **rejected the application of the 'eggshell skull' rule** in a medical negligence case, **restoring a compensation of Rs 5 lakhs** awarded by the district consumer forum.

**What is the 'eggshell skull'?**

The "eggshell skull" rule, also known as the **"thin skull rule" in some cases**, is a legal principle applied in **civil litigation**. Essentially, it dictates that a **defendant in a lawsuit is liable for all injuries** caused to the plaintiff, even if the plaintiff's condition makes them more susceptible to harm than an average person.

In this case, **Jyoti Devi suffered prolonged pain due to a needle left in her abdomen after surgery**. While lower courts applied the rule, the SC ruled it inapplicable as Jyoti didn't have pre-existing vulnerabilities. The ruling emphasized prolonged suffering and delayed justice as factors justifying the enhanced compensation.

### 45. SUPREME COURT ORDERS IN NEWS

SC orders	Descriptions
SC limits ED's power to arrest PMLA accused	<b>Background of the case:</b> The judgment stemmed from Tarsem Lal's appeal against the ED after being denied anticipatory bail by the Punjab and Haryana High Court. It raised questions on whether an accused appearing in a special court could seek bail under CrPC provisions
	<b>SC decisions:</b> <b>Enhancement of Right to Personal Liberty:</b> Individuals summoned by a special court under PMLA are not considered in custody and don't need to apply for bail under PMLA's strict conditions
	<b>Limitation on ED's Powers to Arrest:</b> ED must apply separately for custody after a special court acknowledges a case, providing specific reasons for custodial interrogation.
	<b>Additional Relief for Accused:</b> An accused, who appears in a special court pursuant to its summons, <b>could be exempted from personal appearance in the future. However</b> , if an accused does not appear after a summons is served, the <b>special court could issue a bailable warrant followed by a non-bailable one.</b>
	<b>About Prevention of Money Laundering Act (PMLA), 2002:</b> Enacted in January 2003, the PMLA aims to <b>prevent and control money laundering</b> , confiscate laundered property, and address related issues in India. The Act has been amended multiple times, most recently by the Finance Acts of 2015, 2018, and 2019.
	<b>Section 3 defines money laundering</b> as engaging in activities with proceeds of crime.
	<b>Section 45 of the PMLA imposes stringent bail conditions</b> , requiring the accused to prove innocence and assure no further offences while on bail, posing significant challenges for bail.
SC order on Right to Property	The Supreme Court ruled that <b>compulsory acquisition of property without proper procedures and fair compensation</b> is unconstitutional, affirming the right to private property as a constitutional and <b>human right</b> .
	SC stated that <b>Article 300A has been characterised both as a constitutional and also a human right</b> . Article 300A states that <b>"no person shall be deprived of his property save by authority of law"</b>
	The court stated that <b>procedural justice is a cornerstone of Article 300A</b> when the acquisition of private property by the State is for a public purpose and on the payment of compensation.
	<b>Seven basic rights:</b> The court laid down seven basic <b>procedural rights of private citizens which constitute the "real content of the right to property under Article 300A"</b> that the state should respect before depriving them of their private property. <b>They include:</b> <ol style="list-style-type: none"> <li><b>Right to notice</b> or the duty of the state to inform the person that it intends to acquire his property</li> <li><b>Right of the citizen to be heard</b> or the duty of the state to hear the objections to the acquisition</li> <li><b>Right of the citizen to make a reasoned decision</b> or the duty of the state to inform the person of its decision to acquire property</li> <li><b>Duty of the state to demonstrate</b> that the acquisition is <b>exclusively for public purpose</b></li> <li><b>Right to fair compensation</b> of the citizen</li> <li><b>Duty of the state</b> to conduct the process of acquisition efficiently and within prescribed timelines</li> <li><b>Right of conclusion</b> i.e. the conclusion of the acquisition proceedings leading to the vesting of fair compensation</li> </ol>
	<b>Right to Property in Indian Constitution:</b> Initially considered a fundamental right protected under <b>Article 31 and Article 19(1)(f)</b> of the Constitution, this status was altered ( <b>44th Amendment Act of 1978</b> ) as both articles were deleted and replaced with a single provision, <b>Article 300A, housed in Part XII</b> . This amendment redefined the legal status of the right to property, shifting it from a <b>fundamental to a constitutional right</b> .

## Governance

### 46. PRADHAN MANTRI JAN AROGYA YOJANA (PMJAY)

#### Context:

A study in Chhattisgarh revealed that **despite the Pradhan Mantri Jan Arogya Yojana (PMJAY), out-of-pocket spending (OOPE)** on health remains high, particularly in private hospitals, due to the **widespread practice of dual billing**

#### PMJAY Overview:

1. **Ministry:** Ministry of Health and Family Welfare
2. **Genesis:** Launched in 2018 as part of Ayushman Bharat scheme
3. **Benefit:** Offers Rs. 5 lakhs/year/family for secondary and tertiary care in public and private hospitals, without restrictions on family size, age, or gender.
4. **Coverage:** Includes pre and post-hospitalization expenses, covering all pre-existing medical conditions.

#### Challenges with PMJAY Implementation:

1. **High Out-of-Pocket Spending:** Despite PMJAY, significant out-of-pocket expenditure persists, particularly in private hospitals.
2. **Dual Billing:** Private hospitals engage in dual billing, charging patients and claiming reimbursement from the government, leading to fraudulent practices.
3. **Disparities in Cost:** Medical expenditure in private hospitals is substantially higher compared to public hospitals, exacerbating financial burdens on patients.
4. **Catastrophic Health Expenditure:** Utilization of private hospitals under PMJAY often results in catastrophic health expenditure for vulnerable groups.
5. **Poor Regulation:** Lack of effective regulation allows private hospitals to overcharge patients, undermining the affordability goal of PMJAY.
6. **Limited Access for Vulnerable Groups:** Vulnerable sections like scheduled tribes and women predominantly rely on public hospitals, limiting their access to private sector benefits promised by PMJAY.
7. **Capacity Deficit:** Some states face capacity issues with a high number of people per empanelled healthcare provider.
8. **Delayed Claim Settlements:** Despite clear guidelines, there are delays in settling claims.
9. **Validation Control Issues:** Lack of essential validation controls in beneficiary registration, with instances of linking multiple beneficiaries to a single mobile number.
10. **Grievance Disposal:** The delayed resolution of grievances, with only around 10% addressed within the 15-day turn-around time, as per the CAG report.
11. **Whistleblower Policy Non-Adoption:** Several states, including Bihar, Chhattisgarh, and Rajasthan, have not adopted a whistleblower policy.

## Federalism

### 47. MULLAPERIYAR DAM ISSUE

#### Context:

Tamil Nadu accuses Kerala of obstructing Mullaperiyar dam work while expressing safety concerns. Kerala allegedly delays routine maintenance, hindering strengthening efforts.

#### About the Dam:

**The Mullaperiyar Dam, a 126-year-old** structure in **Kerala's Idukki district**, is **owned and maintained by Tamil Nadu** for various purposes like irrigation and hydro-power.

Disputes over its safety and water levels have led to ongoing litigation. While the Supreme Court allowed a rise in water levels **to 142 feet in 2014**, Kerala has advocated for **decommissioning the dam** and building a new one. Tamil Nadu seeks to complete strengthening work and **restore levels to 152 feet**.



**About the Periyar River:**

The Periyar River, **stretching 244 km, is Kerala's longest river**, earning the title "**Lifeline of Kerala**" due to its perennial flow. Originating from the **Sivagiri hills in Tamil Nadu** and passing through **Periyar National Park**, its main tributaries include **Muthirapuzha, Mullayar, Cheruthoni, and Perinjankutti**

International Relations

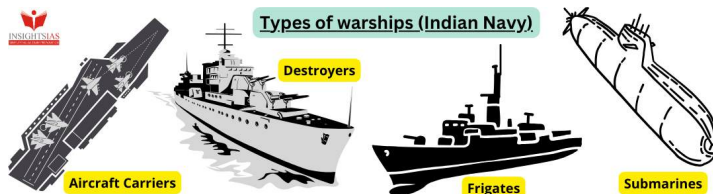
**48. PAKISTAN'S HANGOR CLASS SUBMARINE**

**Context:**

Pakistan has unveiled its inaugural Hangor class submarine, designed as a direct counterpart to India's Kalvari class submarines.

**About Kalvari class submarines:**

It was constructed by **Mazagon Dock Shipbuilders Limited under Project-75**, are derived from the **French Scorpene-class submarines**. These vessels feature **diesel-electric propulsion** and serve as attack submarines. India currently operates **six submarines** of this class: **Kalvari, Khanderi, Karanj, Vela, Vagir, and Vagshir**. The Indian Navy is in the process of equipping these submarines with an **indigenous Air Independent Propulsion (AIP)** system, enabling extended submerged operations for non-nuclear submarines.



Type of Warship	Description	Examples
Aircraft Carriers	Large ships capable of carrying and launching aircraft.	INS Vikramaditya, INS Vikrant (under construction)
Destroyers	Versatile warships with anti-air, anti-ship, and anti-submarine capabilities.	INS Kolkata, INS Visakhapatnam, INS Imphal
Frigates	Smaller than destroyers, with multi-role capabilities.	INS Shivalik, INS Nilgiri
Corvettes	Compact warships designed for coastal defense and patrol duties.	INS Kamorta, INS Kiltan
Submarines	Submersible vessels used for stealthy underwater operations.	INS Kalvari, INS Arihant
Patrol Vessels	Smaller craft used for patrolling, search and rescue, and other coastal missions.	INS Saryu, INS Sunayna
Mine Countermeasures Vessels	Designed for mine-clearing operations.	INS Nireekshak, INS Karwar
Landing Platform Docks	Amphibious assault ships for launching troops and equipment ashore.	INS Jalashwa, INS Shardul
Offshore Patrol Vessels	Used for patrolling and surveillance in offshore waters.	INS Vikram, INS Vajra
Research Vessels	Ships dedicated to scientific research and oceanographic studies.	INS Sagardhwani, INS Sindhughosh (research variant)
Training Ships	Used for training purposes and instruction of naval cadets.	INS Tarangini, INS Sudarshini

**49. DIPLOMATIC PASSPORTS**

**Context:**

After sexual abuse allegations surfaced against Janata Dal (Secular) MP Prajwal Revanna, he fled to Germany using a **diplomatic passport**.

Aspect	Details
About	 <p>Diplomatic and Official passports are <b>issued to individuals holding diplomatic status or deputed by the Government of India</b> for official duty abroad. They have <b>maroon covers and are valid for five years or less</b>.</p>
Benefits	<p>Holders enjoy <b>specific privileges and immunities</b>, including <b>exemption from arrest, detention, and certain legal proceedings</b> within the host country.</p>

<b>Issued To</b>	Those with diplomatic status or Government-appointed individuals on official business abroad or Officers working under branches A and B of the Indian Foreign Service (IFS) Relatives and immediate family of IFS and MEA officers or Selected individuals authorized for official government travel.
<b>Grounds of Revocation</b>	Revocation grounds under the <b>Passport Act 1967</b> include wrongful possession, suppression of material information, interests of India's sovereignty and integrity, friendly relations with foreign countries, and more.
<b>Exemption of Visa Requirements</b>	India has <b>operational visa exemption agreements with 34 countries</b> for diplomatic passport holders, including Germany, France, Austria, and Switzerland. Additionally, agreements with 99 other nations allow <b>visa exemption for stays up to 90 days</b>

## 50. U.N. COUNTER-TERRORISM TRUST FUND

### Context:

India has contributed **\$500,000 to the U.N. Counter-Terrorism Trust Fund**, reaffirming its commitment to global efforts against terrorism.

**This contribution supports UNOCT's global programmes**, mainly focusing on Countering Financing of Terrorism (CFT) and Countering Terrorist Travel Programme (CTTP). CFT strengthens **member states capacity** to understand terrorism risks, while CTTP assists in detecting and countering terrorists.

India's efforts include the **Financial Intelligence Unit – India and the National Investigation Agency**.

### About UNOCT:

**Established in 2017, the United Nations Office of Counter-Terrorism (UNOCT)** oversees the UN Counter-Terrorism Trust Fund, which was **initially established in 2009** and later transferred to UNOCT. The **UN Counter Terrorism Centre (UNCCT)** serves as its primary capacity-building arm, aiming to **enhance the visibility, advocacy, and resource mobilization** for UN counter-terrorism efforts. Its functions also include strengthening the delivery of UN counter-terrorism capacity-building assistance to Member States.

## 51. CHABAHAH PORT

### Context:

India and Iran have signed a 10-year contract for the operation of the Chabahar port, marking a significant milestone in their maritime cooperation.

The agreement enables the operation of the **Shahid-Behesti terminal by Indian Ports Global Ltd. (IPGL)** in collaboration with **Iran's Port and Maritime Organisation (PMO)**. With an investment of approximately \$120 million from IPGL, India has also offered a credit **window of \$250 million for infrastructure improvement projects** related to Chabahar. This agreement aims to **enhance trade, marine cooperation, and transshipment**, benefiting not only India and Iran but also Afghanistan.

### About the Port

**Chabahar Port**, located in **Iran's Sistan and Baluchestan province**, is strategically significant as the **only deep-sea port in Iran** with direct ocean access. It is part of the proposed **International North-South Transport Corridor (INSTC)**, linking the Indian Ocean and the Persian Gulf to the Caspian Sea and northern Europe. For India, Chabahar Port offers a **counterbalance to Pakistan's Gwadar Port and China's Belt and Road Initiative**, providing access to Afghanistan and Central Asia. Challenges in the project's execution include US sanctions on Iran impacting equipment suppliers and proposed Chinese involvement in Chabahar's duty-free zone, potentially hindering India's interests. Chabahar's strategic importance as a **vital trade artery connecting India with Afghanistan and Central Asian countries** is underscored, emphasizing its role in regional economic development and stability.

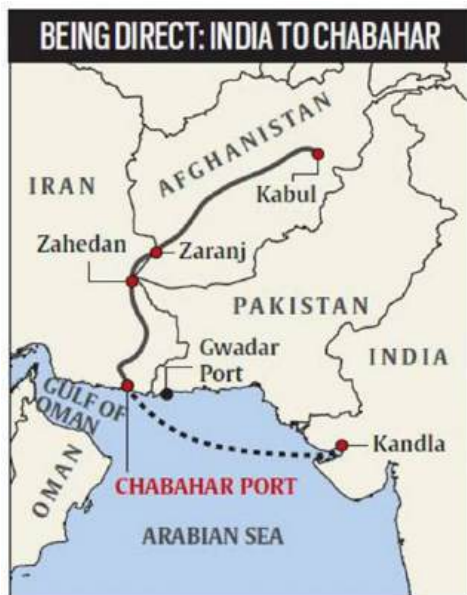


### Context:

The **US has warned of potential sanctions** following **India's signing of a 10-year contract with Iran** to operate the **Chabahar port**.

**About Chabahar Port:**

- Chabahar port, strategically located in Iran’s Sistan-Baluchistan province, facilitates India’s trade access and has been a key element in the trilateral agreement between India, Iran, and Afghanistan since 2016.
- India has invested significantly in the port, supplying equipment worth \$25 million and operating it through India Ports Global Limited.



**52. COUNTERING AMERICA’S ADVERSARIES THROUGH SANCTIONS ACT (CAATSA)**

**Context:**

India and Iran signed a 10-year contract on Chabahar Port, but the US State Department warned against business deals with Iran due to potential sanctions risk under CAATSA.

**About CAATSA**

It, enacted in 2017, is a US law targeting countries engaged with Russia, North Korea, and Iran through economic sanctions. It imposes penalties on nations conducting significant transactions with Russian intelligence and military entities. In 2018, the US House of Representatives passed an amendment exempting India from CAATSA sanctions for purchasing the S-400 missile defence system from Russia.

**53. GLOBAL ALLIANCE OF NATIONAL HUMAN RIGHTS INSTITUTIONS (GANHRI)**

**Context:**

The Global Alliance of National Human Rights Institutions (GANHRI) has deferred the accreditation of India’s National Human Rights Commission (NHRC) for the second consecutive year, which could impact India’s voting rights at the Human Rights Council and some UNGA bodies.

- The deferral was based on issues highlighted in previous reports, such as lack of transparency in NHRC member appointments, involvement of police officers in human rights investigations, and insufficient gender and minority representation.
- These concerns were reiterated by civil society organizations and human rights activists.

This marks the first time India’s NHRC has faced two consecutive years of deferred “A-status” accreditation, a status it has held since 1999 with brief interruptions.

The Global Alliance of National Human Rights Institutions (GANHRI) is an international organization that brings together national human rights institutions (NHRIs) from around the world.

GANHRI’s primary objectives include promoting and strengthening NHRIs to be more effective in their role of protecting and promoting human rights at the national level.

**54. ANTARCTIC PARLIAMENT MEETS IN KOCHI**

**Context:**

India has hosted the 46th Antarctic Treaty Consultative Meeting (ATCM 46) in Kochi, organized by the National Centre for Polar and Ocean Research through the Ministry of Earth Sciences.

**What is ATCM (also called Antarctic Parliament)**

The Antarctic Treaty Consultative Meeting (ATCM) is an annual gathering of the parties to the 1959 Antarctic Treaty, including the original twelve signatories and other nations conducting significant research in Antarctica.

At this year’s ATCM, India will introduce a new working group focused on formulating regulations to monitor tourism and protect the continent’s fragile ecosystem. Representatives from the 56 member countries of the Antarctic Treaty will attend. This is the first time India is hosting the meeting since 2007.

**Key Agenda at ATCM 46**

1. Promoting peaceful governance in Antarctica.
2. Introducing a new working group to regulate tourism and mitigate its impact on the fragile ecosystem.
3. Discussing sustainable management of resources, biodiversity, research collaboration, and climate change impacts.
4. Presenting India’s plan for the construction of Maitri II.

**About Antarctic Treaty**

The Antarctic Treaty, **signed on December 1, 1959**, and in force since June 23, 1961, is an **international agreement governing activities in Antarctica**. It designates the continent as a **scientific preserve**, ensuring it remains exclusively for peaceful purposes. Initially signed by 12 countries, the treaty now **includes 56 signatories, with India joining in 1983**. Key provisions prohibit military activities, promote scientific cooperation, and ban nuclear explosions and radioactive waste disposal.

**India in Antarctica**

Since 1983, India has been a **consultative party to the Antarctic Treaty**, participating in governance decisions. India operates three research stations: **Dakshin Gangotri (1983-1990), Maitri (since 1989), and Bharati (since 2012)**. India plans to establish a new station, Maitri II, by 2029. In 2022, **India enacted the Antarctic Act** to reaffirm its commitment to the treaty's principles.

**55. ICC ISSUES ARREST WARRANT AGAINST ISREAL'S PM AND HAMAS LEADER**

**Context:**

The Prosecutor of the **International Criminal Court (ICC)** requested arrest warrants against leaders of Hamas and Prime Minister Benjamin Netanyahu of Israel about the October 7, 2023 attacks and the war in Palestine.

**What is the International Criminal Court?**

The International Criminal Court (ICC) is a permanent international court headquartered in **The Hague, Netherlands**. **Established by the Rome Statute in 1998 (entered into force on July 1, 2002)**, it investigates, prosecutes, and tries individuals accused of genocide, crimes against humanity, war crimes, and the crime of aggression. With 124 countries as States Parties to the Rome Statute, **India, US, China are notably not a member**. The ICC comprises **18 judges serving non-renewable 9-year terms** and operates alongside, rather than replacing, national criminal justice systems, complementing their efforts. Palestine became the 123rd member of the Rome Treaty on April 1, 2015. **Israel is not a Party to the Rome Statute.**

**Are ICC decisions binding? What happens next?**

**The ICC's decisions are binding.** However, it relies on the cooperation of States for support, particularly for making arrests and transferring the arrested individuals to the ICC detention centre, for freezing assets, and enforcing sentences.

Previously, ICC issued **an arrest warrant for war crimes for President Vladimir Putin ( first time that the ICC has issued an arrest warrant against one of the five permanent**

**members** of the United Nation Security Council)

ICJ vs. ICC		
	International Court of Justice (ICJ) La Cour Internationale de Justice (CIJ)	International Criminal Court (ICC) La Cour pénale internationale (CPI)
Year Court Established	1946	2002
UN-Relationship	Official court of the U.N., commonly referred to as the "World Court."	Independent. May receive case referrals from the UN Security Council.
Location	The Hague, The Netherlands	The Hague, The Netherlands
Types of Cases	Contentious between parties & Advisory opinions	Criminal prosecution of individuals
Subject Matter	Sovereignty, boundary, & maritime disputes, trade, natural resources, human rights, treaty violations, treaty interpretation, and more.	Genocide, crimes against humanity, war crimes, crimes of aggression
Funding	UN-funded.	Assessed contribution from state parties to the Rome Statute; voluntary contributions from the U.N.; voluntary contributions from governments, international organizations, individuals, corporations and other entities.

**56. ARAB LEAGUE SUMMIT**

**Context:**

**UN Secretary-General António Guterres**, speaking at the **Arab League Summit** in Bahrain, called for a **humanitarian ceasefire in Gaza, the release of all hostages, and unimpeded aid access.**

**About the Arab League:**

- The **Arab League, formally known as the League of Arab States**, is a **regional organization of Arab countries in and around North Africa and the Middle East.**
- It was founded on **March 22, 1945, in Cairo** with the signing of the **Pact of the League of Arab States also known as the Alexandria Protocol**, by Egypt, Iraq, Transjordan (now Jordan), Lebanon, Saudi Arabia, and Syria.
- The League has since **expanded to include 22 member states** (India has observer status)

**57. BIMSTEC**

**Context:**

The BIMSTEC Charter, which came into force on May 20, 2024, grants the organization a **'legal personality,' enabling it to welcome new members and observers.**

This milestone **allows BIMSTEC to engage in structured diplomatic dialogue** with other countries and groupings. The charter reaffirms India's dedication to fostering a prosperous, peaceful, and sustainable neighbourhood, emphasizing shared history, culture, and mutual respect among member states.

**What is Legal Personality?**

Legal personality refers to the **recognition of an entity**, such as an organization or corporation, as having rights and obligations similar to those of a natural person.

**BIMSTEC**

Stands for **The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation**

Founded in 1997 through **Bangkok Declaration**

**7 MEMBER COUNTRIES**

**Institutional Mechanism:**

- **BIMSTEC Summit** – highest policymaking body comprised of heads of state.
- **Ministerial Meeting** – attended by the External/Foreign Ministers of Member States.
- **BIMSTEC Working Group**
- **Business Forum & Economic Forum**

**Importance of BIMSTEC**

- Accounts for **22%** of the world's population
- Combined GDP of **\$2.7 trillion**
- One-fourth of the world's traded goods cross the Bay every year
- Six focus areas: trade, technology, energy, transport, tourism and fisheries

**'BIST-EC', it became BIMSTEC in 2004 after inclusion of Nepal and Bhutan**

First summit held in Thailand  
Sri Lanka is the current Chair

SAARC	BIMSTEC
1. Only a regional organisation (South Asia)	1. Interregional organisation (South Asia+ South East Asia)
2. Established in 1985 with the signing of the SAARC Charter in Dhaka.	2. Established in 1997, with Bangkok declaration
3. Issues: Mistrust and suspicion, plagued by regional politics and asymmetric power balance	3. Members maintain reasonably friendly relations and Intra-regional trade has increase by around 6% in a decade.

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## 58. RECOGNITION OF PALESTINE

### Context:

**Ireland, Norway, and Spain** plan to formally recognize the state of Palestine, highlighting a shift in international opinion. Recently, **143 countries, including India**, called for UN recognition of Palestine. The **International Criminal Court has sought arrest warrants for Israeli leaders and Hamas for war crimes**.

- These recognitions are **symbolic acts aimed at influencing Israel's actions in Gaza and supporting moderate Palestinian forces**. The international community is urging Israel to reconsider its stance on the two-state solution.

### About Palestine:

Palestine, officially the State of Palestine, is **located in the southern Levant region of West Asia**. It comprises the **West Bank and Gaza Strip**, bordering Israel, Jordan, and Egypt. The capital is **Jerusalem**, with **Ramallah** as the administrative centre. Historically, the region has seen various rulers and holds religious significance for **Judaism, Christianity, and Islam**. After the Ottoman Empire's fall, the **British controlled Palestine** until the establishment of Israel in 1948, which led to the displacement of many Palestinians. The **Oslo Accords** in the 1990s led to the **creation of the Palestinian Authority**. Currently, the West Bank is partly governed by the Palestinian Authority, while Hamas controls the Gaza Strip. Major challenges include the Israeli occupation, settlement expansions, and the status of Jerusalem and refugees. Despite these issues, Palestine has a highly educated population, an emerging economy, and significant tourism. As of May 2024, it is a **non-member observer state at the UN**.

since 2012.



## 59. MANAMA DECLARATION

### Context:

Recently, the Arab League called for **UN peacekeeping forces in the Palestinian territories** during a summit in Manama, Bahrain.

The “Manama Declaration” (Manama is the capital and largest city of **Bahrain**) urged **international protection and UN peacekeeping** forces in the occupied Palestinian territories until a **two-state solution** is achieved. It also demanded an **immediate ceasefire in Gaza** and an end to forced displacement in the region.

### About the Arab League:

**It is a regional organization of Arab states in the Middle East and parts of Africa**. Formed in **Cairo on March 22, 1945**, it aims to **promote Arab interests** and coordinate **political, cultural, economic, and social programs** among its members. The League also seeks to **settle disputes among member states** and provide mutual military support. Its headquarters is in Cairo, Egypt, and its official language is Arabic. The League has **22 members**, with founding members including Egypt, Syria, and Iraq. Four nations have observer status: **Brazil, Eritrea, India, and Venezuela**.

## 60. SMALL ISLAND DEVELOPING STATES (SIDS4)

### Context:

At the Fourth International Conference on Small Island Developing States (SIDS4) in St. John's, Antigua and Barbuda, the Global Environment Facility (GEF) emphasizes **sustainable development for SIDS**.

The GEF, alongside partners, has **provided \$1.9 billion in grant finance to SIDS**, supporting green and blue economy approaches, biodiversity conservation, climate resilience, renewable energy, and more. The ongoing **GEF-8 funding cycle (2022 – 2026)** prioritizes the needs of SIDS and Least Developed Countries (LDCs).

### What are Small Island Developing States (SIDS)?

**They are a group of countries characterized by their small land area**, limited resources, and vulnerability to environmental and economic challenges. They are typically located in the Caribbean, Pacific, and Indian Ocean regions. SIDS face unique developmental issues, including climate change impacts, natural disasters, and limited economic diversification opportunities.

#### About GEF:

**The Global Environment Facility (GEF) was established in 1992** during the Rio Earth Summit. It comprises funds dedicated to addressing **biodiversity loss, climate change, pollution, and land and ocean health** issues. Governed by an Assembly, Council, Secretariat, and various agencies, it supports **five major international conventions**, including the Minamata Convention on Mercury and the UN Framework Convention on Climate Change. **With 184 member countries, including India**, its secretariat is in Washington, D.C., and the **World Bank serves as its trustee**, managing the GEF Trust Fund.

## 61. COLOMBO PROCESS

#### Context:

India has assumed the chair of the Colombo Process for 2024-26, the first time since the forum's inception in 2003.

#### About Colombo Process

The Colombo Process is a **Regional Consultative Process** focused on managing overseas employment and contractual labour. It comprises **12 Asian member states**, including Bangladesh and Sri Lanka, with India as a founding member. Priority areas include **skills and qualification recognition** and fostering ethical recruitment practices. **The UN's International Organization for Migration** provides technical and administrative support.

**About the IOM:** Established in 1951 as part of the UN System, headquartered in Geneva, Switzerland. It comprises 175 member states and aims to address displacement issues and facilitate pathways for regular migration. It leads initiatives like the Global Compact For Migration.

#### Reports and Indices

Reports/Study	Description
<a href="#">Global Report on Internal Displacement 2024</a>	The report was released by the Internal Displacement Monitoring Centre (IDMC)
	A report by the <a href="#">Internal Displacement Monitoring Centre (IDMC)</a> reveals that about <b>76 million people were internally displaced (IDPs) globally by the end of 2023</b> , up from over 71 million in 2022. Of these, over 68 million were displaced due to conflict and violence, with Sudan, Syria, the Democratic Republic of the Congo, Colombia, and Yemen hosting nearly half.
	<b>In South Asia, Manipur is a significant contributor.</b>
A report, titled 'Land Squeeze', released by the International Panel of Experts on Sustainable Food Systems (IPES-Food)	The <b>Internal Displacement Monitoring Centre or IDMC</b> is an international non-governmental organization established in 1998 by the <b>Norwegian Refugee Council in Geneva</b> . It is focused on monitoring and providing information and analysis on the world's internally displaced persons
	The report <b>"Land Squeeze" by IPES-Food highlights unprecedented pressures on global farmland.</b>
	In India, over <b>70% of arable land faces degradation and desertification</b> . Additionally, the top 10% of landowners control 45% of the farmland, and the average agricultural holding is just <b>1.08 hectares (2015-16)</b> .
	<b>What is Land Squeeze?:</b> Land Squeeze refers to the increasing and converging pressures on global farmland, leading to issues like land degradation, desertification, land concentration, and fragmentation
	IPES-Food is an international <b>non-profit association</b> , with the goal to promote transition to sustainable food systems around the world and it was <b>registered in Belgium in the year 2015</b> .

<a href="#">World Wildlife Crime Report 2024</a>	Released by the <a href="#">United Nations Office on Drugs and Crime</a> (UNODC)
	A report covering 2015-2021 reveals that <b>rhinoceroses and cedars were the most impacted animal and plant species</b> , respectively. The largest number of seizures during this period involved <b>corals, followed by crocodilians and elephants</b> .
	Animal species seizures increased from 2015 to 2019 before declining in 2020 and 2021, while plant species seizures saw a sharp rise in 2020 and 2021.
	Wildlife crime, defined as the <b>illegal taking, possession, trade, or use of wild animals and plants</b> or their derivatives, is driven by demand for medicine, pets, bushmeat, and ornamental plants, along with the high profits from illegal trade and corruption undermining regulations.
	Globally, efforts to combat wildlife crime include the <b>UNODC’s Global Programme for Combating Wildlife and Forest Crime</b> , launched in 2014, and the Wildlife Crime Initiative by TRAFFIC and WWF
	The <a href="#">United Nations Office on Drugs and Crime (UNODC)</a> , established in 1997 by merging the <b>UNDCP</b> and the Crime Prevention and Criminal Justice Division, focuses on combating illicit drug trafficking and abuse, crime prevention, criminal justice, international terrorism, and political corruption. It adopted its current name in <b>2002 and is part of the United Nations Development Group</b>
<b>“Shrinking democracy, growing violence: internet shutdowns in 2023 published by Access Now organization</b>	In 2023, India maintained its position with the <b>highest number of global Internet shutdowns for the sixth consecutive year</b> , totalling 116 incidents.
	Prolonged shutdowns, lasting over five days, surged from <b>15% to over 41%</b> .
	Shutdowns were often imposed due to <b>communal tensions, violence, and exams, drawing criticism domestically</b> and internationally.
	<b>Manipur</b> witnessed the longest shutdown, with 47 orders amid human rights violations.

### GS-3

#### [Indian Economy](#)

## 62. RBI’S DIRECTION FOR ELECTRONIC TRADING PLATFORMS (ETPS)

#### Context:

The RBI released a **draft Master Direction for Electronic Trading Platforms (ETPs)**, seeking feedback from stakeholders by May 31.

#### What are ETPs?

Electronic Trading Platforms (ETPs) are **electronic systems that facilitate the trading of various financial instruments** such as securities, money market instruments, foreign exchange instruments, derivatives, and more. Unlike recognized stock exchanges, ETPs operate as electronic platforms where buyers and sellers can execute trades electronically.

In India, examples of ETPs include: **NSE NOW** (NSE’s Online Trading System), **BSE Bolt**, Currency ETPs, **MCX** (Multi Commodity Exchange) and **NCDEX** (National Commodity & Derivatives Exchange)

#### RBI’s Direction:

The RBI issued a **Draft Master Direction on Electronic Trading Platforms (ETPs) in 2024**, stipulating those entities must obtain prior authorization or registration from the RBI to operate an ETP. To qualify, an entity must be incorporated in India and **maintain a minimum net worth of Rs 5 crore**

### 63. IREDA GET NAVRATNA STATUS

**Context:**

Recently, IREDA (Indian Renewable Energy Development Agency), the financing agency for Renewable projects in India, was conferred with '[Navratna status](#)' by the Department of Public Enterprises (Ministry of Finance)

IREDA is under the administrative control **of the Ministry of New and Renewable Energy**. It was established as a Non-Banking Financial Institution in 1987.

This status **grants greater autonomy and facilitates quicker decision-making**, attracting more investments and skilled talent. As a Navratna PSU, IREDA can operate more efficiently, compete effectively, and achieve sustainable growth.

Criteria for Maharatna Status	Criteria for Navratna Status	Criteria for Miniratna Status
1. Shall have <b>Navratna status</b>	1. Miniratna Category - I or Schedule 'A' CPSEs	Miniratna Category-I status: <ul style="list-style-type: none"> <li>• <b>Made profit</b> in the last 3 years continuously</li> <li>• <b>Pre-tax profit is Rs.30 crores</b> or more in at least 1 of the 3 years</li> <li>• Having <b>Positive net worth status</b></li> </ul>
2. <b>Listed on the Indian stock exchange</b> with prescribed public shareholding	2. 'Excellent' or 'Very Good' rating in 3 of last 5 years	Miniratna Category-II status: <ul style="list-style-type: none"> <li>• <b>Made profit</b> for the last 3 years continuously</li> <li>• Having <b>positive net worth status</b>.</li> <li>• <b>Not defaulted</b> in the repayment of loans/interest payment on any loans due to the Government.</li> <li>• <b>Not dependent upon budgetary support</b> or Government guarantees.</li> </ul>
3. <b>Average annual turnover &gt; Rs. 25,000 crore</b> (last 3 years)	3. <b>Composite score of 60 or above</b> in the following 6 performance indicators including Net Profit to Net Worth, Cost of Services, Earning per share, etc.	
4. <b>Average annual net worth &gt; Rs. 15,000 crores</b> (last 3 years)		
5. <b>Average annual net profit after tax &gt; Rs. 5,000 crores</b> (last 3 years)		
6. <b>Significant global presence/international operations</b>		

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### 64. CORPORATE GOVERNANCE CHARTER

**Context:**

Recently, CII (Confederation of Indian Industry) introduced a corporate governance charter tailored for startups, featuring **a self-evaluative scorecard** to assess governance progress.

**What is Corporate Governance?**

It comprises **dynamic principles and measures guiding an organization's growth**. It emphasizes values like transparency, fairness, and accountability. The charter release responds to the erosion of shareholders' value in Indian startups, prompted by governance failures in notable firms like **BharatPe and GoMechanic**.

**Key Highlights of the Charter:**

1. **Objective:** The charter acts as a self-governing code for startups under the Companies Act, 2013.
2. **Benefits:** It aids startups in enhancing value, stability, growth, resilience, competitiveness, and long-term success.
3. **Guidelines:** Tailored for different startup stages: Inception, Progression, Growth, and Going Public, offering clear role definitions.

4. **Online Scorecard:** Enables startups to assess their governance status and track improvements over time.

**Definition of Startups:**

<b>According to the Income Tax Act</b>	A startup in India is a private limited company, partnership firm, or limited liability partnership (LLP) that meets the following criteria:
	<b>Incorporation:</b> The startup must be incorporated or registered within the last 10 years
	<b>Turnover:</b> The startup's annual turnover must be less than INR 100 crore in any financial year since incorporation
	<b>Innovation:</b> The startup must work on developing or improving a product, process, or service, or have a scalable business model with the potential to create wealth and employment
<b>As per the earlier Definition Of Startup by the Department of Industrial Policy and Promotion (DIPP)</b>	<b>Originality:</b> The startup must not be formed by splitting or reconstructing an existing business
	A startup is an entity incorporated as a <b>private limited company</b> , an enterprise in a partnership or as an LLP (Limited Liability Partnership) in India whose revenue is up to Rs 25 crores

**About CII:**

The Confederation of Indian Industry (CII) is a **non-governmental trade association and advocacy group** based in New Delhi, India, established in 1895. It collaborates with business, political, academic, and societal leaders to influence global, regional, and industry agendas. CII operates on a membership basis and has been designated **as the B20 India Secretariat by the Indian government** for leading the B20 India process during India's G20 Presidency in 2023.

### 65. G-SEC

**Context:**

The [Reserve Bank of India](#) (RBI) has announced that the **Foreign Portfolio Investment (FPI) limits for investment in various securities** will remain unchanged for the current fiscal year.

- The limits for FPI investment in **government securities (G-sec)**, state development loans, and corporate bonds will be maintained **at 6%, 2%, and 15% respectively**, of the outstanding stocks of securities.

**About G-sec:**

G-Secs, or Government Securities, are **tradable instruments issued by governments through auctions conducted by the RBI**. They come in two types: short-term, known as **treasury bills**, with maturities of less than one year, and long-term, known as **Government bonds or dated securities**, with maturities of one year or more. The Central Government can issue both treasury bills and government bonds, while **State Governments issue only government bonds**, also known as State Development Loans (SDLs).

## 66. GATI SHAKTI CARGO TERMINALS INITIATIVE

**Context:**

The Railway Ministry plans to expand its **Gati Shakti Cargo Terminals initiative**, aiming to offer an **additional 200 terminals** to corporate entities and freight operators.

This expansion follows the **success of the initial 100 terminals** announced in the Union Budget of 2022-23. With **77 terminals already operational**, the initiative aims to **boost rail-based supply chains**, increase rail freight volumes, and generate additional revenue for the railways.

The **Gati Shakti scheme** (launched in 2021) is a national master plan aimed at coordinating infrastructure projects to **reduce logistics costs**. Key points include integrating planning for infrastructure projects, cutting costs, boosting trade, and improving connectivity.

## 67. INDIA'S HIGH FOOD INFLATION

**Context:**

In 2023, while world food prices experienced a significant decline from their 2022 highs, **India saw persistently high food inflation, reaching 9.5% in December 2023**. This contrasts sharply with **global deflation of -10.1%** during the same period.

**Factors contributing to the drop in global food prices include:**

- An abundant supply of key crops:** Bumper harvests in 2023, particularly of wheat, resulted in a surplus in the global market, contrasting with concerns over supply disruptions in 2022.
- Improved supply from Russia and Ukraine:** Despite disruptions, both countries maintained wheat exports, easing supply anxieties.
- Lower demand for vegetable oils:** Increased vegetable oil supplies and reduced use for biofuel production led to an approx. 32% drop in the UN's Vegetable Price Index.
- Slowing demand:** High inflation and economic recession fears reduced consumer demand, particu-

larly in major food-importing regions, decreasing import demand and lowering global prices.

**India's high food inflation amid falling global food prices can be attributed to several factors:**

- Limited transmission of global prices:** While world food prices decreased, India's remained elevated due to limited transmission of international prices to domestic markets, except for edible oils and pulses.
- Export bans and import duties:** The Indian government imposed bans on certain food exports and provided import duty waivers, reducing global market influences on domestic prices.
- Domestic production challenges:** Weather conditions affecting crop yields, particularly for cereals, pulses, and sugar, contributed to supply shortages and higher prices domestically.
- Low stock levels:** Low stock levels for commodities like wheat and sugar exacerbated price pressures.

**Food inflation in India** is primarily calculated using **the Consumer Price Index (CPI) for Food and Beverages**, a key measure tracking price changes of a typical consumer basket. Food carries a weight **of 45.9% in the CPI**, but its contribution to overall inflation has risen from 48% in April 2022 to 67% in November 2023.

Recent data from the government's Household Consumption Survey indicates **a decline in food's share of the consumption basket, dropping below 50%** for rural consumers and 39% for urban consumers.

## 68. FRONT RUNNING

**Context:**

SEBI has mandated Asset Management Companies (AMCs) to establish an institutional mechanism to deter potential market abuse, including front-running, following recent instances observed by the market regulator.

**What is Front Running?**

Front-running is an **illegal practice** in the stock market where an individual or entity trades based on **advanced information** obtained from a broker or analyst before it is made available to their clients.

**Example**

Suppose a **broker** receives a large order to buy shares of Company X from a client. Before placing the order on behalf of the client, the broker may purchase shares of Company X **for their personal account**, knowing that the client's order will drive up the price of the shares. **Once the price of the shares rises, the broker can sell their shares at a profit.**

1 Gets an order  
To buy one million shares of Syndicate company

2 Places order for same stock for his own account

3 Then places the client's order

4 Due to bulk orders, the broker makes a huge profit

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### What are AMCs?

Asset Management Companies (AMCs) are financial institutions responsible for managing and investing funds pooled from investors in various financial assets such as stocks, bonds, and other securities. These companies create and manage investment products like mutual funds, exchange-traded funds (ETFs), and pension funds.

### Other Changes approved:

1. **Amendments to SEBI (Mutual Funds) Regulations, 1996** were approved by the SEBI Board, requiring **AMCs to implement enhanced surveillance systems** and internal controls to identify and prevent misconduct.
2. AMCs must also have a **whistleblower mechanism** for transparency. SEBI will outline the framework, while the Association of Mutual Funds in India (AMFI) will specify detailed standards.

## 69. STANDARD ESSENTIAL PATENTS (SEPS)

### Context:

The judiciary's involvement in standard essential patents (SEPs) poses challenges for India's telecom manufacturing sector.

### What are Standard Essential Patents (SEPs)?

Standard Essential Patents (SEPs) are **patents that cover technologies adopted as industry standards**, crucial for ensuring interoperability among different products and systems. These patents are essential for implementing a particular standard, and companies that own SEPs commit to licensing them to others on **fair, reasonable, and non-discriminatory (FRAND)** terms.

For example, in the telecom sector, technologies like **CDMA, GSM, and LTE** are industry standards. Any company manufacturing products compliant with these standards must use technologies covered by SEPs. This ensures that devices from different manufacturers can **work together seamlessly**, benefiting consumers and promoting innovation in the industry.

### Issues with SEPs?

The significance of Standard Essential Patents (SEPs) in the telecom sector lies in **ensuring compatibility among different cellular phone brands**. However, private Standard Setting Organisations (SSOs) largely control the standard-setting process, **limiting India's influence**. Consequently, SEP owners can demand high royalties, leading to the **"patent hold-up"** problem.

### How judiciary is dealing with it?

**Despite competition law enforcement** efforts initiated by the Competition Commission of India (CCI) in 2013, legal battles, particularly against Ericsson, have led to prolonged

litigation. Meanwhile, the Delhi High Court's judicial activism in patent infringement cases has resulted in **unprecedented "deposit" orders**, burdening manufacturers and raising questions about procedural fairness.

These prolonged legal battles and judicial interventions have **eroded investor confidence and market stability, hindering India's manufacturing dreams**.

## 70. GST APPELLATE TRIBUNAL (GSTAT)

### Context:

**Sanjaya Kumar Mishra, former Chief Justice of Jharkhand High Court**, has been appointed as **President of the GST Appellate Tribunal (GSTAT)** for a four-year term by the Appointment Committee of Cabinet.

- This move aims to **expedite the establishment of GSTAT**, with plans to commence its operations from July 1.

### About GSTAT:

**It was established under the Central GST (CGST) Act, 2017**, and serves as the **Second Appellate Authority** for hearing appeals against orders under the CGST Act and State GST Acts. It ensures consistency in resolving GST disputes and operates with a Principal Bench in New Delhi and 31 State benches. The **Principal Bench, led by the President, comprises two Technical Members, one from the Centre and one from the State**.

### Eligibility criteria for the members:

1. Must be a judge of the High Court.
2. Alternatively, can be a retired District Judge or Additional District Judge with a minimum of 10 years of combined experience.
3. Lawyers with at least 10 years of experience, particularly in litigation related to indirect taxes.

## 71. CENTRAL DRUGS STANDARD CONTROL ORGANISATION (CDSCO)

### Context:

The **Central Drugs Standard Control Organisation (CDSCO)** will now exclusively have the authority to issue **manufacturing licenses for new drugs intended for export**, removing this power from state governments.

- This change, effective from **May 15, 2024**, mandates that all applications for **No Objection Certificates (NOCs)** for export purposes be submitted to CDSCO zonal offices (through **SUGAM Portal**)
- Since 2018, the **State Licensing Authority granted export NOCs** and manufacturing licenses for unapproved, banned, or new drugs meant solely for export purposes.

**Aim:** This decision aims to streamline the export process and address delays highlighted by the Drug Consultative Committee (DCC).

**About CDSKO:**

The Central Drugs Standard Control Organisation (CDSKO) operates under the **Ministry of Health & Family Welfare, headquartered in New Delhi**. It oversees regulatory functions under the **Drugs & Cosmetics Act, 1940 and rules 1945**. CDSKO is responsible for **approving drugs, conducting clinical trials, setting drug standards**, and ensuring quality control of imported drugs. It operates through 9 zonal offices across the country.

## 72. MICRO, SMALL, AND MEDIUM ENTERPRISES (MSMES)

**Context:**

A new provision in the **Income-Tax Act aimed** to ensure timely payments to micro, small, and medium enterprises (MSMEs) has led to **unintended consequences**.

**The Finance Act 2023** introduced an **amendment to the Income Tax Act**, stipulating that payments owed to MSMEs must be resolved **within 45 days to qualify for tax deductions**.

This applies to transactions involving **goods or services from MSMEs registered under the MSMED Act, 2006**. Effective from April 1, 2024, the amendment has led to unintended consequences, including **large companies shifting orders to unregistered MSMEs (to avoid tax liabilities)** and smaller entities surrendering their registration to sustain business operations. Tax experts suggest extending payment timelines to alleviate the issue.

## 73. DRIP PRICING

**Context:**

The Department of Consumer Affairs warns against drip pricing.

**What is Drip Pricing?**

Drip pricing is a tactic where **only part of a product's price is advertised**, with additional charges revealed later. It's used to attract customers and has been **labelled as a dark pattern** under **Guidelines for Prevention and Regulation of Dark Patterns, 2023**



This practice **goes against principles of transparency and fairness in pricing**, as consumers may feel deceived when confronted with unexpected costs. It can also **hinder their ability to make informed purchasing decisions** and compare prices accurately.

## 74. INDIA VIX

**Context:**

India's VIX surged above **16.5** amidst election-driven volatility, prompting caution from experts on leveraged positions. With the general election outcome nearing, **market experts anticipate increased volatility**.

**What is India VIX?**

India VIX is a **volatility index that measures the expected volatility** in the Indian stock market over the next 30 days. It is often referred to as the **"Fear Index"** because it reflects investors' sentiments about the market's future volatility.

A high India VIX suggests that **investors expect significant fluctuations in stock prices**, indicating uncertainty and risk in the market. Conversely, a low India VIX indicates expectations of relatively stable market conditions.

## 75. REPATRIATION AND DISINVESTMENT

**Context:**

The recent **decline in gross foreign direct investment (FDI)** is concerning, but equally worrying is the **increasing pace of repatriation and disinvestment**.

**What is repatriation and disinvestment?**

Repatriation refers to the **process of sending profits, dividends, or funds earned from investments in a foreign country** back to the investor's home country.

Disinvestment, on the other hand, involves **reducing or liquidating investments in a particular asset or sector, typically by selling off shares or assets** owned by a government, company, or individual.

**Concerns:** Repatriation and disinvestment are concerning because they indicate a **withdrawal of capital from India**, potentially undermining the positive impact of foreign direct investment (FDI) inflows.

**Data:**

- **46 FDI proposals were pending** with 17 government departments for over 12 weeks
- **Gross FDI inflows fell by 16% to \$71 billion** in 2022-23, with repatriation and disinvestment accounting for 41% of it.

**This trend, rising steadily since 2001-02, negates FDI's positive impact**, necessitating institutional oversight revival, in-

investigation into causes of repatriation, and simplification of procedures to retain and attract foreign investors.

## 76. RBI'S STRICTER REGULATIONS FOR PROJECT FINANCE

### Context:

The Reserve Bank of India (RBI) has proposed stricter regulations for project finance, aiming to reduce risks in infrastructure projects. These rules include higher provisioning during construction and classifying delayed projects as non-performing assets.

According to RBI guidelines, lenders must maintain 5% provisions for projects under implementation. Provisioning involves banks setting aside funds from their profits to cover potential losses.

Lenders fear these rules could hinder project viability and slow India's capital expenditure momentum.

## 77. "NON-MARKET ECONOMY" STATUS

### Context:

Vietnam seeks a change from its "non-market economy" status to a "market economy" in the US, aiming to avoid high import taxes. Despite being a top US trading partner, Vietnam faces anti-dumping duties due to its current classification.

The US designates economies as "non-market economies" based on criteria such as currency convertibility, wage determination, FDI inflow, state control, and human rights. Currently, 12 countries, including Russia, China, and Vietnam, hold this designation. Being labelled a "non-market economy" allows the US to impose anti-dumping duties on imports from these countries.

## 78. INDIA IS NOW A NET EXPORTER OF MEDICAL CONSUMABLES AND DISPOSABLES

### Context:

India has achieved a significant milestone by becoming a net exporter of medical consumables and disposables, marking a reversal of the previous trend where foreign products dominated the market.

In the fiscal year 2022-23, India exported medical consumables worth \$1.6 billion, surpassing imports valued at approximately \$1.1 billion.

This achievement follows intensified efforts by the government to reduce reliance on imports, particularly after dis-

ruptions caused by the COVID-19 pandemic.

The MedTech sector focuses on designing and manufacturing medical products for diagnosis, prevention, and treatment. Major categories include disposables, electronics, equipment, and surgical instruments.

India's MedTech sector is projected to grow 28% annually, reaching \$50 billion by 2030. Despite ranking as Asia's 4th largest market, challenges include a focus on low-end products, with 65% of manufacturers catering to local consumption.

## 79. CHINA - INDIA'S LARGEST TRADING PARTNER

### Context:

In FY24, China reclaimed its position as India's largest trading partner with bilateral trade reaching \$118.4 billion, driven by a 3.24% increase in imports to \$101.7 billion and an 8.7% rise in exports to \$16.67 billion as per Global Trade Research Initiative (GTRI) report.

- This marked a shift from the previous two years when the US held the top spot.
- India-US trade slightly decreased to \$118.3 billion, with exports falling by 1.32% and imports dropping by 20%.
- Over the past five years, India's trade deficit with China has widened significantly due to a 44.7% surge in imports, particularly in critical sectors like telecom, technology components, and EV batteries.

The GTRI report highlights a broader trend of increased trade deficits with key partners such as Russia and the UAE while showing significant growth in trade with countries like Saudi Arabia.

## 80. INDIA INTERNATIONAL BULLION EXCHANGE (IIBX)

### Context:

The State Bank of India (SBI) has become the first bank to be a trading-cum-clearing member of the India International Bullion Exchange (IIBX) at GIFT City in Gujarat.

- This allows SBI's branch at GIFT City to conduct and settle trades on the IIBX platform on behalf of its clients.
- According to RBI guidelines, Indian bank branches at GIFT IFSC can act as trading and clearing members of IIBX, and special category clients can import gold through IIBX.

### About India International Bullion Exchange (IIBX):

- The IIBX is located at the GIFT City (Gujarat International Finance Tec-City) in Gandhinagar, Gujarat.
- GIFT City is a planned business district aimed at becoming a global financial and IT services hub.

**Purpose:** The primary objective of the IIBX is to create a globally recognized bullion trading platform. It aims to bring transparency, standardization, and cost efficiency to the bullion market, benefitting various stakeholders, including miners, importers, banks, and jewellers.

## 81. WHOLESALE PRICE INDEX (WPI)

### Context:

Recently, India's Wholesale Price Index (WPI)-based inflation surged to a 13-month high of 1.26%, up from 0.5%, driven primarily by increases in food and fuel prices.

- Economists noted that this spike was influenced by seasonal factors and base effects.
- Food inflation, specifically, hit an eight-month high at 5.5%, with manufactured food products and primary food articles contributing significantly.

The Wholesale Price Index (WPI) is an economic indicator that measures the average change in prices of goods at the wholesale level, i.e., before they reach the retail level. It is used to track inflation and deflation trends in the economy by reflecting price changes in a basket of wholesale goods.

## 82. CO-LENDING LOANS

### Context:

The Finance Ministry has tasked SBI with forming a committee to address co-lending issues, aiming to boost credit flow.

### What is Co-lending?

Co-lending, also known as co-origination, is a collaborative lending arrangement involving multiple lenders to extend loans to borrowers.

E.g., a business needs a large sum of money for a business project. Instead of relying solely on one bank, two financial institutions—let's say a bank and a non-banking finance company (NBFC)—join forces to provide the loan. This collaborative approach helps to spread the risk between the two lenders while increasing the overall amount of money available for lending. So, co-lending allows borrowers to access larger loans while diversifying risk for the lenders.

As per RBI, banks and NBFCs can co-lend loans to priority sectors, with a minimum 20% credit risk on NBFCs, and the rest on banks. Banks are not allowed to enter into a co-lending arrangement with an NBFC belonging to the promoter Group.

## 83. ASSET RECONSTRUCTION COMPANIES (ARCS)

### Context:

The Reserve Bank of India (RBI) has raised supervisory con-

cerns regarding the functioning of asset reconstruction companies (ARCs).

### What are ARCs?

Asset Reconstruction Companies (ARCs) are financial institutions that acquire and manage stressed assets from banks and financial institutions. Registered under Section 3 of the SARFAESI Act, 2002, ARCs face several challenges, including issues like back-door entry of defaulting promoters, lengthy settlement processes, and non-transparent practices.

### Previously, in April RBI issued a master direction for ARCs:

1. The direction stipulates that ARCs must maintain a minimum capital requirement of Rs 300 crore, with existing ARCs given until March 31, 2026, to meet this threshold.
2. Non-compliant ARCs will face supervisory action, including the prohibition on incremental business until compliance is achieved.
3. ARCs with a minimum Net Owned Fund (NOF) of Rs 1000 crore can act as resolution applicants and are permitted to invest in specified instruments, subject to certain conditions and caps on investment.

## 84. MATERIOVIGILANCE PROGRAMME OF INDIA (MVPI) PLATFORM

### Context:

The Drugs Controller General of India (DCGI), through a circular, has directed all device license holders and manufacturers to report any adverse events on the Materiovigilance Programme of India (MvPI) platform to mitigate risks and ensure public health safety.

### About MvPI:

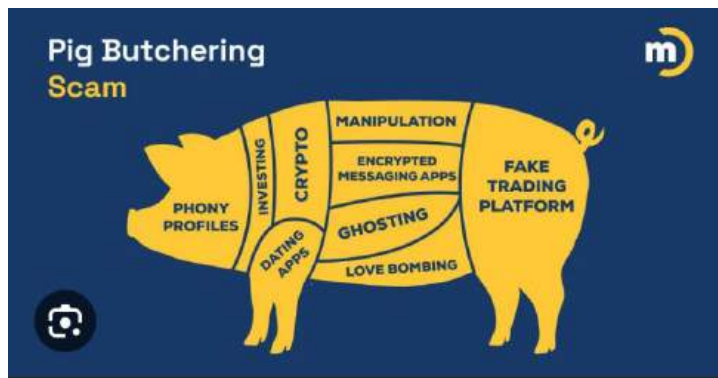
It was launched in 2015, and is overseen by the Indian Pharmacopoeia Commission since 2018. It serves as the National Coordination Centre, focusing on monitoring Medical Device-associated Adverse Events (MDAE) and raising awareness among healthcare professionals. MDAE reports can be submitted by various stakeholders, including clinical specialists, biomedical engineers, nurses, pharmacists, and patients.

### About DCGI:

The Drugs Controller General of India (DCGI) heads the Central Drugs Standard Control Organization, overseeing the approval of licenses for specified drug categories in India, including blood products, vaccines, and IV fluids. DCGI operates under the Ministry of Health & Family Welfare and establishes standards for drug manufacturing, sales, import, and distribution in the country.

## 85. PIG BUTCHERING SCAM

**Pig Butchering Scams**, also known as “sha zhu pan” scams, involve building trust with victims over time before tricking them into investing in fraudulent schemes. It is a type of **long-term scam and investment fraud**. For instance, scammers may offer attractive job opportunities or investment plans, creating emotional connections to lower victims’ guard.



## 86. COMPETITION COMMISSION OF INDIA

**Context:**

At the **15th Foundation Day event of the Competition Commission of India (CCI)**, the Attorney General of India highlighted the **challenges digital markets pose for global competition regulators**.

**About the Competition Commission of India:**

- The **Competition Commission of India (CCI)** is a **regulatory body** established by the **Government of India to enforce the Competition Act, 2002**.
- Its **primary objective is to promote and sustain competition in markets, protect the interests of consumers, and ensure freedom of trade**.

## 87. THE PRE-PACKAGED INSOLVENCY RESOLUTION PROCESS (PPIRP)

**Context:**

The **Pre-packaged Insolvency Resolution Process (PPIRP)** has successfully facilitated the **full settlement of operational creditors’ claims for five companies**.

**About The Pre-packaged Insolvency Resolution Process (PPIRP):**

- The Pre-Packaged Insolvency Resolution Process (PPIRP) is a **mechanism for resolving corporate insolvency** that was added to the **Insolvency and Bankruptcy Code (IBC) in 2016**.
- It’s designed to be **faster and more efficient than other processes** and **to minimize disruption to busi-**

**nesses.**

**The PPIRP process involves:**

- Preparing and negotiating a resolution plan before insolvency proceedings begin
- Implementing the plan immediately when insolvency proceedings start
- Completing the **entire process within 120 days**

## 88. TOP STARTUP CITIES

**Context:**

PitchBook recently released its **2024 global Venture Capital ecosystem rankings**, spotlighting the top 50 startup cities worldwide.

**Mumbai secured the 32nd spot, Bengaluru ranked 34th, and Gurugram made it to 48th place.** The report highlights a **surge in innovation and growth** in the global startup landscape, attracting significant investments and fostering multi-billion-dollar valuations.

**The top five cities were:**

1. San Francisco Bay Area, USA
2. New York City, USA
3. Beijing, China
4. Shanghai, China
5. Los Angeles, USA

India has emerged as the **3rd largest ecosystem** for startups globally as of 31st May 2023. **India ranks 2nd in innovation quality** with top positions in the quality of scientific publications and the quality of its universities among middle-income economies.



### Classification of Startups

**Unicorns:** Companies founded after 2000 and valued at least \$ 1bn e.g. CRED



**Gazelles:** Likely to become unicorns in two years (USD 500mn to 1 bn) e.g. Dunzo, Rapido



**Cheetahs:** Likely to become unicorns in four years e.g. Pepperfry, SUGAR Cosmetics



**Government initiatives:**

1. **National Initiative for Developing and Harnessing Innovations (NIDHI)**
2. **Startup India Action Plan (SIAP)**
3. **Ranking of States on Support to Startup Ecosystems (RSSSE)**
4. **Startup India Seed Fund Scheme (SISFS):** Provides financial aid to startups for various stages like proof of concept, prototype development, and market entry.
5. **National Startup Awards:** Recognizes exceptional startups and ecosystem enablers for their contributions to innovation and economic growth.
6. **SCO Startup Forum:** Launched to enhance startup ecosystems collectively among SCO countries.
7. **Prarambh Summit:** Provides a platform for startups and young innovators worldwide to showcase ideas and inventions.

**PitchBook**, renowned for its comprehensive financial data and insights, serves as a vital resource in the capital markets, with offices in London, New York, San Francisco, and Seattle.

## 89. INDIA'S TRADE DEFICIT

**Context:**

According to recent official data, India recorded a **trade deficit with nine of its top 10 trading partners**, including China, Russia, Singapore, and Korea, in 2023-24.

**What is Trade Deficit?**

A trade deficit occurs when a **country's imports exceed its exports**, meaning it buys more goods and services from other countries than it sells to them. This results in a negative balance of trade, indicating that more money is flowing out of the country to pay for imports than is coming in from exports.

India's total trade deficit narrowed to about **\$238 billion in 2023-24, down from \$265 billion** the previous year. The trade deficit widened with **China, Russia, Korea, and Hong Kong** but narrowed with the **UAE, Saudi Arabia, Russia, Indonesia, and Iraq**.



China became **India's largest trading partner with over \$118 billion** in bilateral trade, surpassing the U.S., which had over **\$118 billion in trade**. India maintains free trade agreements with **Singapore, the UAE, Korea, and Indonesia**. Significant

trade surpluses were recorded with the U.S. (of over \$36 billion), the U.K., Belgium, Italy, France, and Bangladesh.

## 90. WIPO TREATY

**Context:**

WIPO member states approved a **historic new Treaty on intellectual property (IP), genetic resources (GR), and traditional knowledge (TK)**, following decades of negotiations.

**Need for the Treaty:**

1. **Addressing Biopiracy:** Ensures traditional knowledge is not exploited without permission or compensation.
2. **Utilization:** Genetic resources and traditional knowledge are often used in patented inventions and scientific research.

**About the Treaty:**

1. **Inclusive:** It marks the first WIPO Treaty to include provisions for Indigenous Peoples and local communities.
2. **New Disclosure Requirement:** Patent applicants must disclose the country of origin or source of GR and the Indigenous Peoples or local community that provided the associated TK.
3. **Membership:** Any WIPO member state can join.
4. **Non-Retroactivity:** The treaty does not apply to patents filed before its entry into force.

**About WIPO:**

**The World Intellectual Property Organization (WIPO)** was established in 1967 through the **WIPO Convention**, transforming the earlier **United International Bureau for the Protection of Intellectual Property (BIPRI)** into WIPO. As a specialized agency of the United Nations, WIPO serves as a **global forum for intellectual property (IP) services**, policy, information, and cooperation. **Headquartered in Geneva, Switzerland**, WIPO boasts a membership of **193 member states**, including India. WIPO administers several key treaties, such as **the Berne Convention, Washington Treaty, Paris Convention, and the Singapore Treaty on the Law of Trademarks**, among others

## 91. SOVEREIGN BOND YIELDS

**Context:**

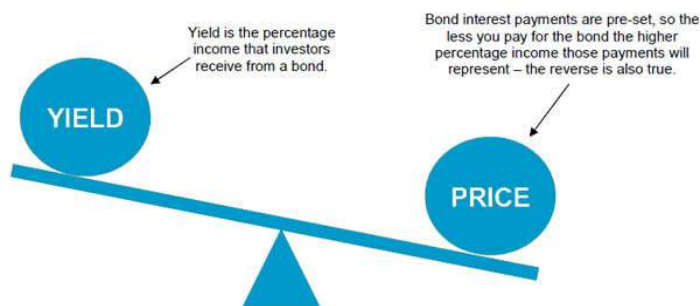
Sovereign bond yields fell to near one-year lows following **RBI's record dividend payout to the government**. The **10-year benchmark yield closed at 6.978%**, its lowest since June 6, 2023.

Expectations of **lower government borrowing and improved fiscal deficit** contributed to the decline. Additionally, **easing crude oil prices** and resumption of overseas investment

boosted market sentiment.

### What is Bond Yield?

Bond yield represents the **return on capital invested in a particular bond**. It is inversely related to bond price, meaning as the price of a bond increases, its yield decreases, and vice versa. This relationship is crucial in the bond market, as **fluctuations in yield** impact the attractiveness of bonds to investors.



**A decline in government bond yields** has significant implications, as it lowers borrowing costs across the economy, with **sovereign debt yields** serving as benchmarks for determining corporate borrowing rates. The recent decrease in sovereign bond yields can be attributed to the record-high **dividend payout of Rs 2.11 lakh crore by the Reserve Bank of India** to the government, which is expected to bolster the government's financial position.

Additionally, improved market sentiment due to **falling crude oil prices** has spurred buying interest in bonds, further contributing to the decline in yields.

**Sovereign bonds are specific debt instruments** issued by governments and play a crucial role in financing government expenditures.

#### Factors Affecting Sovereign Bond Yield:

- Creditworthiness:** Perceived ability of the issuing country to repay debts.
- Country Risk:** External/internal factors affecting stability.
- Exchange Rates:** Impact of economic volatility and inflation on bond interest rates.

## 92. ZIMBABWE' ZIG

### Context:

**Zimbabwe** has launched its **newest currency, the ZiG**, which is backed by gold and aimed at addressing the country's **long-standing issues with currency instability** and hyperinflation.

**The ZiG, introduced on April 5, 2024**, co-circulates with other foreign currencies in the economy.

### About Gold-backed currency:

**It has a fixed value directly tied to gold and is convertible** into the precious metal. Its money supply is constrained by **available gold reserves**, offering inherent value and potential long-term stability.

**In contrast, fiat currency lacks intrinsic value** and is designated as legal tender by governments. Its value is dictated by supply and demand dynamics and isn't backed by any physical commodity. Fiat currency affords central banks greater control over printing money as needed.

## 93. INITIATIVES LAUNCHED BY RBI

### Context:

The Reserve Bank of India (RBI) launched three major initiatives.

- G-Sec Mobile App:** Enables retail investors to transact in government securities (G-Secs) using smartphones.
- PRAVAAH Portal:** A centralized web-based platform for individuals or entities to apply for authorizations, licenses, or regulatory approvals from the RBI, enhancing efficiency in processing applications.
- Fintech Repository:** A data storehouse for Indian FinTech firms to help understand the sector better and design appropriate policies. Additionally, the **EmTech Repository for RBI-regulated entities** will track the adoption of emerging technologies like AI and blockchain.

These initiatives aim to improve accessibility, efficiency, and data management in financial and regulatory processes.

### Agriculture

## 94. USE OF OXYTOCIN ON CATTLE

### Context:

The Delhi High Court has ordered action **against the use of oxytocin on cattle** in city dairies, citing it as animal cruelty. It instructed the Delhi government to **conduct weekly inspections and file cases against oxytocin use**, with police to investigate.

### Why Oxytocin use is bad for cattle and humans?

**Oxytocin use** leads to **increased milk production** but can **cause health issues** such as uterine ruptures and reduced lifespan in cows. Additionally, it **can contaminate the milk**, posing risks to human health when consumed. Oxytocin misuse in dairy farming is **considered animal cruelty and poses health hazards** to both cattle and consumers.

### About Oxytocin:

**It is a hormone produced by mammalian pituitary glands**, that aids in childbirth, lactation, and social bonding. It's **vi-**

**tal for preventing excessive bleeding postpartum.** However, its misuse of milch cattle to boost yield is harmful. **Regulated under Section 26A of the Drugs and Cosmetics Act of 1940,** administering oxytocin is deemed animal cruelty and is punishable under the **Prevention of Cruelty to Animals Act, 1960.**

## 95. THIRTHAHALLI ARECANUT

### Context:

The Tirthahalli variety of areca has been identified as the best quality among those grown in Karnataka.

### About Areca :

The Areca palm, also known as the yellow palm or butterfly palm, is characterized by clustered slender stems and ascending leaves. **Originating from Madagascar,** it thrives in tropical climates and can also be grown indoors in temperate zones. It's valued as a horticultural and commercial crop domestically and internationally.

Optimal growing conditions include temperatures **between 14°C and 36°C, rainfall ranging from 750 mm to 4500 mm,** and gravelly laterite soil.

**Karnataka dominates arecanut production in India,** contributing approximately 80% of the country's output, with Kerala and Assam following suit. India imports arecanut mainly from Sri Lanka, Myanmar, and Indonesia. To combat illegal imports, the government has imposed a Minimum Import Price.

Farmers face challenges such as the **import of cheaper varieties,** crop damage from excessive rainfall, and **diseases like yellow leaf disease** and fruit rot disease, leading to significant losses in recent years.

**Diseases affecting Arecanut production :** 'Kole Roga' or 'Mahali' (Fruit Rot) , Yellow Leaf Disease, Yellow Leaf Spot ,Nut splitting , Inflorescence die-back and Button shedding

**Blast Disease,'** this plant infection is caused by an air-borne fungus, that attacks the leaves of the arecanut plant.



## 96. ICMR DIETARY GUIDELINES

### Context:

The Indian Council of Medical Research's (ICMR) **National Institute of Nutrition (NIN)** released **17 dietary guidelines emphasizing the importance of healthy eating habits** to combat non-communicable diseases (NCDs) like obesity and diabetes.

### Issues:

- Over 56% of India's total disease burden** is linked to unhealthy diets
- Vulnerable Groups:** Optimal nutrition during critical periods like pregnancy, lactation, and early childhood is crucial. Alarming rates of lifestyle-related conditions among children and adolescents necessitate targeted interventions.
- Dual Nutrition Challenge:** Micronutrient deficiencies and anaemia prevail among children aged 1 to 19, alongside rising obesity rates, indicating the dual challenge of undernutrition and overnutrition.

### 17 Dietary Guidelines include:

Dietary Guidelines
Eat a <b>variety of foods</b> to ensure a balanced diet
<b>Pregnant women and new mothers</b> should have access to <b>extra food and healthcare</b>
Ensure <b>exclusive breastfeeding for the first six months;</b> continue breastfeeding till two years and beyond
After six months of age, the <b>infant should be fed home-made semi-solid complementary foods</b>
Ensure <b>adequate and appropriate diets for children and adolescents</b> in health and sickness
Eat <b>plenty of vegetables</b> and legumes
<b>Use oil/fats in moderation;</b> choose a variety of oil seeds, nuts etc. to meet daily needs of fats and essential fatty acids
<b>Obtain good quality proteins and essential amino acids;</b> avoid protein supplements to build muscle mass
<b>Adopt a healthy lifestyle</b> to prevent abdominal obesity, overweight and overall obesity
Be <b>physically active,</b> exercise regularly
<b>Restrict salt intake</b>
Consume <b>safe and clean foods</b>
Ensure <b>appropriate pre-cooking and cooking methods</b> are used
Drink plenty of water
<b>Minimize the consumption of ultra-processed foods</b> and high-fat, sugar, salt
Prioritize nutrient-rich foods in the diets of elderly people
Read information on food labels

**About ICMR:**

The Indian Council of Medical Research (ICMR) (founded 1911; HQ: New Delhi) is **India's top biomedical research organization**, responsible for formulating, coordinating, and promoting medical research. Its mission includes conducting and implementing medical research for societal benefit and translating innovations into public health solutions. Funded by the Government of India through the **Department of Health Research, Ministry of Health & Family Welfare**.

## 97. BALANCED FERTILIZATION

**Context:**

The next government is expected to **prioritize 'balanced fertilization'**, aiming to discourage excessive use of urea, DAP, and MOP in agriculture.

**What is Balanced Fertilization?**

Balanced fertilization involves providing crops with the right proportion of **primary** (nitrogen, phosphorus, potassium), **secondary** (sulphur, calcium, magnesium), and **micronutrients** (iron, zinc, copper, manganese, boron, molybdenum) based on soil type and crop requirements. The goal is to optimize plant growth and yield while minimizing environmental impact and nutrient imbalances.

**The Nutrient-Based Subsidy (NBS) scheme**, launched by the government, aimed to promote balanced fertilization by fixing subsidies for nitrogen, phosphorus, potassium, and sulphur. However, its exclusion of urea led to its failure, as urea consumption continued to rise steadily despite the scheme's implementation.

Other Steps to promote balanced fertilization include **rationalizing DAP and MOP prices**, potentially bringing urea under the Nutrient-Based Subsidy (NBS) scheme, **restricting fertilizer usage** to specific crops, and marketing fertilizers in granular form to prevent adulteration and ensure slower nutrient release.

## 98. FALL IN TEA PRODUCTION

**Context:**

The **Tea Association of India (TAI)** has warned of a **potential 50% drop in tea production in Assam and West Bengal** in the coming months due to **insufficient and poorly distributed rainfall**.

- Data from the **Tea Board of India** shows **significant declines in production**, with **Assam down 40% and West Bengal down 23% as of March 2024**.

Topic	Information
About	Tea is a popular beverage made from the <b>Camellia sinensis plant</b> and is the second most consumed drink in the world.
Origin	Tea is believed to have originated in <b>northeast India, north Myanmar, and southwest China</b> , with evidence of consumption in China over 5,000 years ago.
Growth Conditions	Tea requires a <b>hot and humid climate</b> , temperatures of <b>20°-30°C</b> , and <b>150-300 cm of well-distributed annual rainfall</b> . It grows well in <b>slightly acidic soil</b> with porous subsoil in the hill ranges.
Health Benefits	Tea consumption can <b>promote health and wellness</b> due to its <b>anti-inflammatory, antioxidant, and weight-loss effects</b> .
Int'l Tea Day	<b>May 21st every year</b> (designated by the UN General Assembly in December 2019)
Production	India is the <b>second-largest producer of tea globally (largest black tea producer)</b> , with the majority of its annual tea production coming from Assam and West Bengal.
Consumption	India is among the <b>world's top tea-consuming countries</b> , with 80% of its production consumed domestically.
Export	India is <b>4th largest tea exporter globally</b> and exports to over 25 countries. The majority of tea exported is black tea, with Darjeeling, Assam, and Nigiri tea being among the finest in the world.
GI Tag	Darjeeling tea, known as the <b>"Champagne of teas,"</b> was the first GI tag product.
Regulator	The Tea Board of India (a <b>statutory body</b> under the Ministry of Commerce) is responsible for developing and promoting the tea industry in India. <b>HQ: Kolkata, formed in 1953</b> . Foreign Offices: Dubai and Moscow.
Employment	Indian tea industry is employing <b>1.16 million workers</b> directly and an equal number of people are associated with it indirectly. <span style="float: right;">Visit Insights IAS Daily CA</span>

## 99. RADIATION PROCESSING

**Context:**

The government plans to expand the **radiation processing of onions** to create a buffer stock of 100,000 tonnes this year, aiming to prevent shortages and price rises.

**With output expected to drop by 16%, radiation technology** will be used to increase shelf life, reducing hoarding and price volatility.

**Radiation Processing:**

- Uses ionizing radiations** like gamma rays, accelerated electrons, and X-rays.
- Delayed ripening** extends shelf life by eliminating spoilage microbes.
- Cannot eliminate microbial toxins** and pathogen viruses.
- Causes minimal chemical changes.
- Least impact on nutritional value** compared to other methods.

**Regulation:**

- Radiation Processing is mandated by the **Prevention of Food Adulteration (Fifth Amendment) Rules, 1994**.
- Requires packages of irradiated foods** to display the green irradiation logo endorsed by Codex Alimentarius Commission and the phrase **'Processed by Irradiation method'**.

**About Onions:**

**The onion, an herb in the lily family**, is globally grown for culinary and medicinal purposes. India is the **world's sec-**

**second-largest producer**, with major states including **Maharashtra, Karnataka**, and others. **Maharashtra leads in production** (42%), followed by Madhya Pradesh (15%) in 2021-22.

**Key export destinations** include Bangladesh, Malaysia, UAE, Sri Lanka, and Nepal. Onion **farmers lack government MSP-based support** and depend solely on market forces.

### 100. KENDU LEAVES

**Context:**

In Koraput district, Odisha, 4,000 tribal farmers are facing a critical delay as they await approval from the forest department to sell kendu leaves worth Rs 34 lakh.

**About Kendu Leaf:**

Kendu leaf, known as the **green gold of Odisha**, is a **nationalized product like bamboo and sal seed**. It is a vital **non-wood forest product**, also referred to as tendu leaf, used for rolling bidis (local cigarettes). Major producing states include Madhya Pradesh, Chhattisgarh, Odisha, Andhra Pradesh, Jharkhand, Gujarat, and Maharashtra, with **Odisha** being the third-largest producer.



Science & Technology

### 101. ETHYLENE

**Context:**

Two individuals were apprehended in Hyderabad for using an **artificial ripening agent, ethylene, on mangoes**.

- Authorities stated that the **use of such chemicals breaches FSSAI guidelines and poses health risks** including **skin burns, irritation, inflammation, lung irritation, heavy metal poisoning, and neurological issues when consumed**.

**About Ethylene:**

1. Ethylene is a **colourless, flammable, and lighter-than-air hydrocarbon gas** with a **sweet, musky odour and the chemical formula C<sub>2</sub>H<sub>4</sub> or H<sub>2</sub>C=CH<sub>2</sub>**.
2. It is the **simplest alkene and the second simplest unsat-**

**urated hydrocarbon.**

3. Ethylene is a **plant hormone that regulates growth and senescence** and is used in **agriculture to ripen fruits and germinate seeds**.
4. As a **fruit matures**, it produces **ethylene to signal ripening**.
5. **Ethylene is also widely used in the chemical industry**, and the world produces more ethylene than any other organic compound.
6. **Polyethene is produced using ethylene**.

### 102. CHLOROPICRIN

**Context:**

The U.S. accuses Russia of using the **chemical compound chloropicrin against Ukrainian forces**, violating the **Chemical Weapons Convention**.

**What is Chloropicrin?**

**Chloropicrin** is a chemical compound ( it is a colourless to yellow oily liquid; highly volatile and is a **gas at room temperature**) **used as both a chemical weapon and a pesticide**. It poses health risks when inhaled, causing irritation, tears, and vomiting. Originally developed as a **poison gas during World War I**, it is also employed as **an antimicrobial agent, herbicide, and nematocide**. Chloropicrin is **highly toxic and carcinogenic**, and its use as a weapon is a violation of international conventions.

**Regulations in place for Chemical Weapons:**

Regulation	Details
<b>Chemical Weapons Convention (CWC)</b>	Entered into force in 1997. It Prohibits the development, production, stockpiling, and use of chemical weapons. It Monitors the elimination of chemical weapons. <b>India is a signatory and party</b> , and it enacted the Chemical Weapons Convention Act, 2000.
<b>Geneva Protocol 1925</b>	Prohibits the use of <b>chemical and biological weapons</b> in conflicts.
<b>Organization for the Prohibition of Chemical Weapons (OPCW)</b>	Headquartered in <b>Hague, Netherlands</b> . It implements the Chemical Weapons Convention. Its mission is to achieve a world free of chemical weapons. It has <b>193 members including India</b> . It was awarded the <b>Nobel Prize for Peace in 2013</b> for efforts to eliminate chemical weapons.

### 103. ETA AQUARIID METEOR SHOWER

**Context:** The Eta Aquariids meteor showers, active from April 16, will peak on May 5 and 6.

This annual event, **caused by debris from Halley's Comet**, peaks on May 5 and 6. It's known for its rapid speed, producing long, glowing tails. Best observed from the Southern Hemisphere, around 30 to 40 meteors can be seen per hour during peak times.

**What is a meteor shower?**

A meteor shower occurs when **Earth passes through clouds of debris left behind by a comet or asteroid**. As these tiny particles enter Earth's atmosphere, they burn up, creating streaks of light in the sky known as meteors or **"shooting stars."** These showers are named after the constellation from which they appear to originate and can produce dozens or even hundreds of meteors per hour during their peak.

**About Halley's Comet:**

It is a famous periodic comet that orbits the Sun **roughly every 76 years**. Named after astronomer **Edmond Halley**, who predicted its return, it is composed of dust, rock, and ice. The comet last appeared in the inner solar system in **1986 and is expected to return in 2061**. It is known for producing two meteor showers, the **Eta Aquariids and the Orionids**, as Earth passes through its debris trails.

**104. GOLDENE**

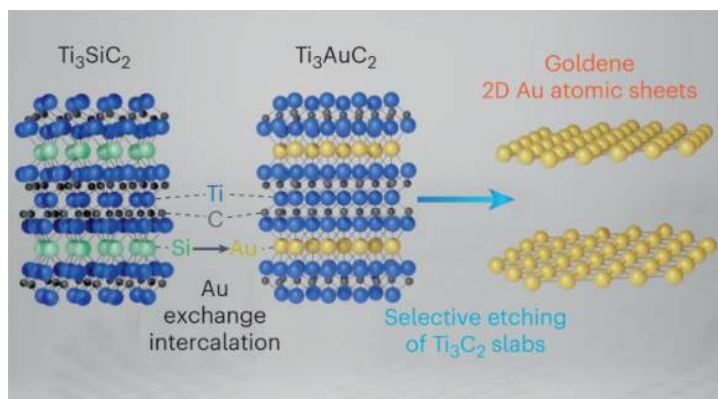
**Context:**

Researchers (at Sweden's Linköping University) have successfully created a **groundbreaking material called Goldene**, a **one-atom-thick sheet of gold**, marking the first time a metal has been developed into a freestanding 2D sheet.

**What is Goldene?**

Goldene is a **one-atom-thick sheet of gold**. It marks the first instance of **a metal being formulated into a freestanding 2D sheet**.

Goldene is made by **sandwiching silicon between titanium carbide layers**, depositing gold atoms on top, and then etching away the titanium carbide layers (using a chemical called Murakami's reagent), resulting in the **creation of a free-standing, one-atom-thick layer of gold**.



**Applications of Goldene include:**

- 1. Electronics:** Goldene holds promise as a catalyst in electronics due to its economic viability and efficiency. It requires fewer gold atoms for the same function compared to thicker, three-dimensional gold materials. This property could potentially revolutionize electronics by reducing the amount of gold needed for electronic components.
- 2. Catalysis:** Goldene's unique properties make it suitable for catalytic applications, such as carbon dioxide conversion, hydrogen-generating catalysis, and selective production of value-added chemicals. Its high surface area and unique atomic structure offer advantages in catalytic reactions.
- 3. Hydrogen Production:** Goldene could play a role in hydrogen production processes, contributing to the development of clean energy technologies.
- 4. Water Purification:** The material's properties may also be utilized in water purification technologies, enhancing the efficiency of water treatment processes.

**105. PEPTIDE**

**Context:**

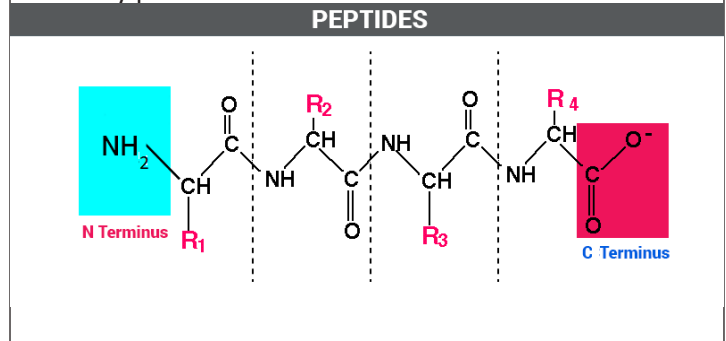
A peptide **derived from cows shows promise in treating deadly drug-resistant bacterial infections**, particularly those caused by **Klebsiella pneumoniae**.

**About the Klebsiella pneumoniae:**

**It is a bacterium commonly found in the intestines**, typically harmless but can cause severe infections like **pneumonia**, urinary tract infections, and wound infections when it enters other parts of the body. Vulnerable populations, such as seniors and those with health conditions like diabetes or cancer, are particularly at risk.

**About the Peptides:**

Peptides are **short chains of amino acids**, the building blocks of proteins, that are naturally found in the body. They are linked together by peptide bonds and play essential roles in various biological functions. Peptides can have diverse functions in the body, such as reducing inflammation, aiding in muscle building, and acting as hormones to regulate different bodily processes.



## 106. THROMBOSIS WITH THROMBOCYTOPENIA SYNDROME (TTS)

### Context:

**AstraZeneca** has acknowledged that its **COVID-19 vaccine, known as Covishield in India**, can lead to a **rare side effect** called **Thrombosis with Thrombocytopenia Syndrome (TTS)**.

- Despite this rare side effect, **experts assert that the benefits of vaccination, particularly in saving lives during the pandemic**, outweigh the risks.
- The risk period **for TTS is shortly after vaccination**.

### About TTS:

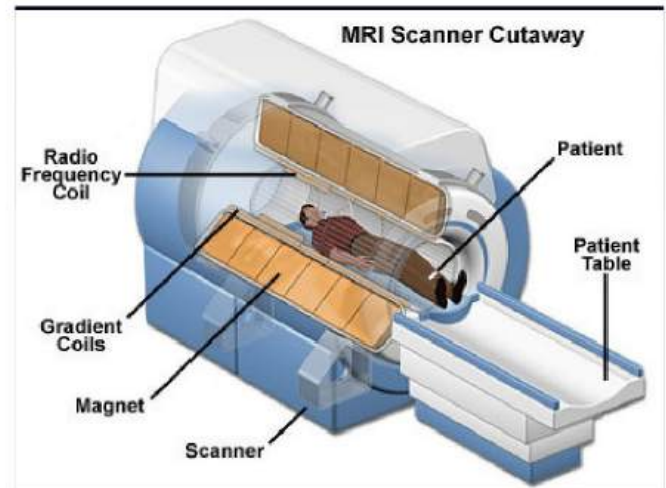
- **Thrombosis with thrombocytopenia syndrome (TTS)**, also known as **vaccine-induced immune thrombotic thrombocytopenia (VITT)**, is a rare condition characterized by the **presence of blood clots (thrombosis) along with a low platelet count (thrombocytopenia)**.
- Thrombosis occurs when **blood clots form**, potentially **obstructing normal blood flow in affected blood vessels**.
- Thrombocytopenia refers to a **deficiency of platelets in the blood**, which are **essential for clot formation and preventing excessive bleeding**.
- TTS is an uncommon but serious syndrome, particularly associated with certain COVID-19 vaccines.

**generate detailed images of the inside of the body**, particularly the soft tissues like the brain, muscles, and organs.

### How does it work?

When a patient **enters the MRI machine**, their **body's hydrogen atoms align with the magnetic field**. Radio waves are then **used to temporarily disrupt this alignment**. When the radio waves are turned off, the **hydrogen atoms return to their aligned state**, emitting energy that is detected by the scanner.

**Different tissues emit different signals based on their hydrogen atom density** and molecular environment, allowing the scanner to create detailed images that physicians can use to diagnose various medical conditions.



## 107. THE UNIVERSITY OF TOKYO ATACAMA OBSERVATORY (TAO) PROJECT

### Context:

The completion ceremony for **the TAO telescope** site was held in Santiago, Chile.

**The TAO Project** aims to **build a 6.5-meter optical-infrared telescope** at the summit of Cerro Chajnantor in the Atacama Desert. It will be the **world's highest astronomical site**, offering clear observation conditions due to the region's high altitude and arid climate. Equipped with instruments like **SWIMS and MIMIZUKU**, it will facilitate studies on galaxy evolution and planet formation.

**Atacama's high altitude, thin atmosphere, and arid climate** make it ideal for infrared observations.

## 109. CHINA'S CHANG'E-6 MISSION

### Context:

China's Chang'e-6 mission, launched successfully, **aims to collect rocks from the Moon's far side**, a complex endeavour requiring precise planning.

### About the Chang Mission:

**Chang'e-6, China's mission to the Moon's far side**, aims to retrieve **2 kilograms of samples**, a feat never accomplished before. Unlike the **Chang'e-5 mission**, which brought back samples from the near side in 2020, this mission targets the unexplored territory of the far side. The spacecraft, equipped with a communications satellite called Queqiao-2, will land in the **South Pole-Aitken basin**, the Moon's largest impact basin.

Additionally, it includes the **ICUBE-Q orbiter, a CubeSat developed by Pakistan**, known for its small size and standardized design.

## 108. MAGNETIC RESONANCE IMAGING (MRI)

**Magnetic Resonance Imaging (MRI) is a non-invasive diagnostic procedure** used to obtain images of soft tissues within the body, such as the brain, cardiovascular system, and joints.

### What is an MRI Scanner?

An MRI (Magnetic Resonance Imaging) scanner is a medical device that **uses a strong magnetic field and radio waves to**

## 110. SECURE IOT

**Context:** IIT Madras **startup Mindgrove Technologies** has launched **Secure IoT**, India's first microcontroller chip, which

is cheaper and more efficient.

**Running at 700 MHz, Secure IoT is 30% cheaper** than other chips and offers high performance, versatility, and security features. It aims to bridge the **gap between premium and budget options in embedded systems**. With potential global interest, it enhances India’s semiconductor self-sufficiency. Mindgrove’s chip powers various devices from wearables to smart city infrastructure, promoting innovation and local production.



**What is a microcontroller chip?**

A microcontroller chip is a small integrated circuit that combines the functions of a central processing unit (CPU), memory, input/output ports, and other peripherals into a single chip. It is commonly used to control and manage electronic devices, ranging from simple household appliances to complex industrial machinery.

## 111. SEMI CRYOGENIC PRE-BURNER IGNITION TEST ARTICLE (PITA)

**Context:**

ISRO recently achieved a **milestone by conducting the first PreBurner Ignition trial for the Semi-Cryogenic Engine (SCE)-200**.

This ignition process is crucial in **developing liquid rocket engine systems**.

The SCE **uses liquid oxygen (LOX) as an oxidizer** and **refined kerosene as fuel**, aiming to produce a thrust of 2,000 kilonewtons (kN).

**ISRO’s Liquid Propulsion Systems Centre in Bengaluru** leads the SCE development, aiming to enhance the **payload capacity of Launch Vehicle Mark-3 (LVM3)** and future launch vehicles. Unlike traditional cryogenic engines, **SCEs offer advantages such as easier storage and handling**, increased thrust capacity, and eco-friendliness, making them more cost-effective.

## 112. NEURAL PROCESSING UNITS (NPUS)

**Context:**

Recently, Apple launched **the M4 chip with the iPad Pro**. Its key feature includes a **16-core Neural Engine** which is equivalent to an NPU.

**Neural Processing Units (NPUs)** are **specialized processors designed for accelerating machine learning operations**, crucial for AI tasks like speech recognition and image processing.

Neural Processing Units (NPUs) are **specialized processors designed to accelerate neural network processes**, crucial for machine learning algorithms. They excel in AI-related tasks like speech recognition and image processing, enabling efficient handling of complex operations in consumer gadgets. NPUs play a crucial role in **deploying AI-powered applications directly on hardware, enhancing performance in various devices**.

**CPU Vs GPU Vs NPU:**

Feature	CPU (Central Processing Unit)	GPU (Graphics Processing Unit)	NPU (Neural Processing Unit)
Processing Method	Sequential computing	Parallel computing	Parallel computing
Ideal for	Sequential data processing, general computing	Graphics rendering, complex computations	Neural network and AI computations
Usage	Applications, systems operations	Graphics rendering, AI development stages	AI tasks, running refined AI models on devices

<b>Efficiency</b>	Moderate	High	High
<b>Power Consumption</b>	Moderate	High	Low
<b>Optimization Focus</b>	General computing	Graphics, complex computations	Neural network, AI computations

### 113. K2-18B AND DIMETHYL SULPHIDE (DMS)

**Context:**

The James Webb Space Telescope is gearing up for a **significant mission targeting K2-18b**, a distant planet with potential for extra-terrestrial life.

Scientists are focusing on **detecting dimethyl sulphide (DMS)** in its atmosphere, a gas primarily produced by life on Earth. Preliminary data suggests a **high probability of DMS** presence.

**Why DMS presence is significant?**

The **presence of dimethyl sulphide (DMS)** in the atmosphere of a distant planet, such as K2-18b, could indicate the **possibility of extraterrestrial life**. On Earth, DMS is primarily produced by **marine phytoplankton**, making it a potential biological marker. If detected on another planet, it suggests the presence of organic or biological processes similar to those found on Earth.

**What is K2-18b Exoplanet?**

- Discovered in 2015 during NASA’s K2 mission**, located over 120 light-years away from Earth.
- Size: Over 8 times larger than Earth.**
- Possibly a “Hycean” world with a hydrogen-rich atmosphere** and an ocean-covered surface.

**About James Webb Space Telescope:**

- Collaboration between **NASA, ESA, and the Canadian Space Agency**.
- Launched in December 2021.
- Currently positioned at the **Sun-Earth L2 Lagrange point**, around **1.5 million km** from Earth’s orbit.
- Largest and most powerful infrared** space telescope.
- Objectives:** To explore cosmic history from the Big Bang to the evolution of galaxies, stars, planets, and our Solar System.

### 114. FOOT ROT DISEASE

**Context:**

The Punjab Agricultural University (PAU) has developed a biocontrol agent, **Trichoderma asperellum**, to manage **foot rot disease in Basmati rice crops**.

**About Foot Rot Disease:** It is a **fungal disease affecting Basmati rice crops**, primarily at the seedling stage. Caused by **Fusarium verticillioides**, a soil-seed borne pathogen. Spreads through the plant root, leading to stem base colonization. Symptoms include pale yellowing, elongation, drying, and eventual death of seedlings. Current treatments involve chemical fungicides like **Sprint 75 WS** (carbendazim + mancozeb), harmful to soil and consumers.

**Trichoderma asperellum:** Biocontrol agent offering a non-chemical alternative, aiding disease management while minimizing environmental harm.

### 115. ALPHAFOLD 3

**Context:**

**AlphaFold 3’s** release has sparked excitement.

**AlphaFold is an AI tool by Google’s DeepMind** to predict protein folding since 2018. It aims to **understand 3D protein shapes**, crucial for biology and health. Versions like AlphaFold 3 offer **about 80% accuracy and model DNA, RNA**, and more. Protein folding is vital for biological function and disease understanding. While AlphaFold aids drug development, its limitations include a lack of explanation for protein folding and restricted access.

## 116. FLIRT

### Context:

New [COVID](#) variants, collectively known as [FLIRT](#), have emerged in India.

The FLIRT variants ([KP.2 and KP1.1](#)) are descendants of the [Omicron JN.1 variant](#). They are characterized by increased transmissibility and the ability to potentially evade immunity from vaccines and previous infections. These variants spread through respiratory droplets and contact with contaminated surfaces.

While [KP.2](#) is more infectious than its predecessor, [JN.1](#), it has shown lower overall infectivity. Symptoms are similar to the [JN.1 variant](#), including sore throat, runny nose, coughing, and fever. Safety measures such as wearing masks, practising hand hygiene, and maintaining physical distancing remain crucial to prevent the spread of these variants and mitigate the impact of the pandemic.

## 117. MEASLES VACCINE

### Context:

A recent study revealed that [nearly 12% of eligible children in India](#) missed out on the recommended [double-dose measles vaccination](#), indicating a significant gap in immunization coverage.

Researchers analyzed data from over 43,000 children aged 2-3 years collected through the National Family Health Survey 2019-21. They found that [northeastern states had the highest share of zero-dose cases](#), with Nagaland at 26% and Tamil Nadu at 4.6%. About 30% of eligible children received only one measles-containing vaccine (MCV1), while 60% were fully immunized (MCV2).

### About Measles:

It is a highly [contagious viral respiratory illness \(caused by a single-stranded RNA virus\)](#) characterized by symptoms like high fever, cough, coryza, conjunctivitis, and rash. It is caused by the measles virus, which affects humans as its only natural host. The [Measles Rubella \(MR\) vaccine](#) has been included in India's Universal Immunization Programme since 2017. [Rubella virus](#) infection typically leads to a mild fever and rash.

Recently, [India has been honoured with the prestigious Measles and Rubella Champion Award](#) by The [Measles and Rubella Partnership](#) at the American Red Cross Headquarters in Washington D.C., USA.

## 118. ULTRA-PROCESSED FOODS (UPF)

**Context:** A 30-year U.S. observational study links [higher consumption of most ultra-processed foods to a slightly elevated risk of death](#), particularly from neurodegenerative causes. Ready-to-eat meat, sugary drinks, dairy desserts, and highly processed breakfast foods showed the strongest associations.

### What is Ultra-processed foods (UPF)?

UPFs are [heavily processed foods with additives, high in fat, sugar, and salt \(HFSS\)](#), and low in essential nutrients. Their increased consumption poses various health risks.

In India, [efforts to curb UPF consumption include revised dietary guidelines](#), the Eat Right India Campaign by FSSAI, limits on trans fatty acids, and taxation on aerated beverages and HFSS foods.

## 119. HOT TEST OF A LIQUID ROCKET ENGINE

### Context:

ISRO achieved a milestone by conducting a successful [hot test of a liquid rocket engine](#) created using [Additive Manufacturing \(AM\) technology](#), commonly known as 3D printing.

The engine tested belongs to the [Reaction Control System \(RCS\) of the upper stage \(PS1\) of the Polar Satellite Launch Vehicle \(PSLV\)](#). The same engine is used in the [Reaction Control System \(RCS\) of the first stage \(PS1\) of PSLV](#). The test took place at [ISRO Propulsion Complex, Mahendragiri, Tamil Nadu](#). This advancement [saves 97% of raw materials](#) and reduces production time by 60%. The new manufacturing process requires only about 13 kg of metal powder compared to [565 kg of forgings and sheets](#) used in conventional manufacturing.

### What is a Hot test?

A hot test is [a procedure conducted to evaluate the performance and functionality](#) of a system or component under operational conditions, typically involving exposure to high temperatures or other extreme conditions.

### About 3D printing:

[It builds a three-dimensional object layer by layer](#) from a digital model, contrasting with traditional subtractive manufacturing. Materials used in AM include thermoplastics, metals, ceramics, and biomaterials.

MeitY released the ["National Strategy for Additive Manufacturing" in 2022](#), with initiatives such as establishing a 3D printing lab at the National Institute of Electronics & Information Technology, Aurangabad. Additionally, the [National Centre for Additive Manufacturing](#) was established in 2023 by MeitY in collaboration with the Government of Telangana.

## 120. ROUNDWORM CAENORHABDITIS ELEGANS

**Context:** Researchers at Princeton University discovered that the [roundworm Caenorhabditis elegans, commonly known as C. elegans](#), exhibits an intriguing behaviour where [offspring inherit the knowledge of avoiding disease-causing bacteria](#) consumed by their parents.

This **transgenerational transmission of learned behaviour** extends up to four generations and is facilitated by **small RNA molecules** produced by the bacteria. Specifically, when *C. elegans* ingests the disease-causing bacterium *Pseudomonas vranovensis*, it also absorbs **small RNA molecules from the bacterium**, altering its feeding behaviour to avoid consuming it in the future. This avoidance behaviour is then **inherited by subsequent generations** of worms, providing them with innate protection against harmful bacteria.

sRNA, a type of **non-coding RNA (ncRNA)**, typically consists of 20 to 200 nucleotides and does not encode proteins. Instead, sRNA molecules interact with proteins and other RNAs, modulating the expression of various genes in the organism.

- They utilize a **multi-bend achromat lattice, a complex array of magnets, to produce narrower and brighter X-ray beams.**

India previously developed its **own synchrotron, Indus-1**. India is an **associate member of the European Synchrotron Radiation Facility (ESRF) in Grenoble, France.**

## 122. NANCY GRACE ROMAN TELESCOPE

### Context:

NASA's upcoming **Nancy Grace Roman Space Telescope**, set to **launch in late 2026**, will search for **tiny primordial black holes dating back to the Big Bang.**

- These **hypothetical black holes, with masses similar to Earth or even large asteroids, could revolutionize theoretical physics if detected.**

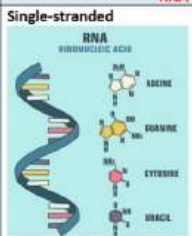
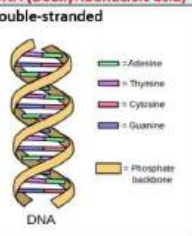
### How it works?

- Detection of these small black holes, which would be impossible to form by any known process, **would utilize gravitational lensing, where the black holes bend light from distant sources.**
- This technique, **currently used to find rogue planets, will help differentiate between these black holes and other objects statistically.**

Confirming their existence would have profound **implications for understanding galaxy formation, dark matter, and cosmic history**, challenging Stephen Hawking's theory that **smaller black holes should have evaporated through Hawking radiation over 13.8 billion years.**

**RNA Vs DNA**

**Context:** Most deadly viruses contain RNA, which gives them **ability to change quickly, replicate easily and infect variety of hosts**. On the other hand, DNA is more stable, error-free and doesn't mutate easily

Property	RNA	DNA (Deoxyribonucleic acid)
<b>Structure</b>	Single-stranded 	Double-stranded 
<b>Sugar component</b>	Ribose	Deoxyribose
<b>Bases</b>	Adenine, guanine, cytosine, uracil	Adenine, guanine, cytosine, thymine
<b>Function</b>	<ul style="list-style-type: none"> <li>mRNA carries genetic information from DNA to the ribosomes for protein synthesis</li> <li>Transfer RNA (tRNA) delivers amino acids to the ribosomes</li> <li>Ribosomal RNA (rRNA) helps to catalyse protein synthesis</li> </ul>	Genetic material carries genetic information
<b>Stability</b>	Less stable	More stable
<b>Mutation rate</b>	Higher mutation rate	Lower mutation rate
<b>Replication</b>	Not self-replicating, need a DNA template	Self-replicating
<b>Genetic information</b>	Can act as genetic material in some viruses	The primary genetic material in organisms

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## 121. HIGH ENERGY PHOTON SOURCE (HEPS)

### Context:

**China is set to become the first country in Asia with a fourth-generation synchrotron light source** with the completion of **the High Energy Photon Source (HEPS).**

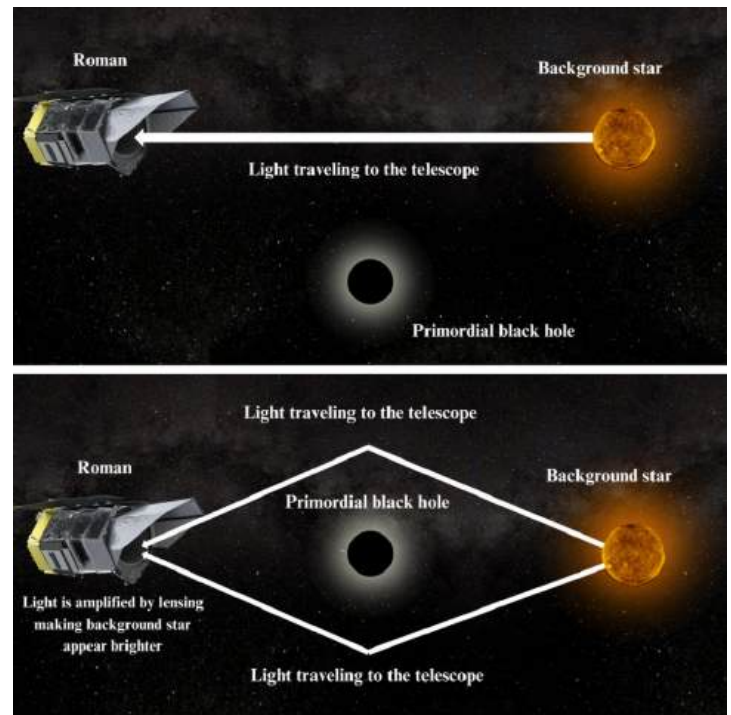
- This advanced facility **will produce some of the world's brightest X-rays**, significantly **enhancing research capabilities across various scientific fields.**
- **HEPS will accelerate electrons to 6 gigaelectron volts**, enabling high-resolution imaging at nanometre scales and facilitating rapid experiments.

### About HEPS (High Energy Photon Source):

- HEPS is recognized as the **brightest synchrotron X-ray source in Asia.**

### Technology used:

- Synchrotrons **use electricity to generate intense beams of light**, over a million times brighter than the sun.



## 123. FIRST HUMAN RECIPIENT OF PIG KIDNEY TRANSPLANT DIES

### Context:

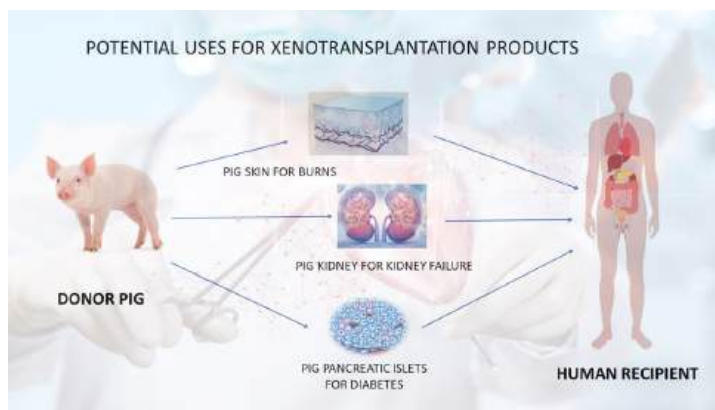
A recipient of a modified pig kidney transplant passed away about two months after the surgery, with no indication that the transplant caused the death.

### What is Xenotransplantation?

It involves **transplanting non-human animal cells, tissues, or organs into humans** to address the shortage of donor organs for transplantation.

### Why Pigs are used?

Pigs are commonly used **due to their similar organ size, physiology, and immune system** to humans. Organs such as the **heart, liver, and lungs** can be utilized. The process involves **gene editing technologies like CRISPR-Cas9** to modify pig genes for better compatibility with humans.



Benefits include an **alternative organ supply and reducing shortages**, but concerns remain about organ rejection, infection risks, and animal welfare.

## 124. GPT-4O

### Context:

**OpenAI has introduced GPT-4o**, its newest and most advanced AI model, designed to enhance ChatGPT by making it **smarter, faster, and free for all users**.

### Features of GPT-4o:

- This **model, named “Omni,”** represents a **significant upgrade from previous models by supporting multimodal interactions**—processing and responding to **text, audio, and images**.
- Unlike its predecessors, which used separate models for different tasks, **GPT-4o integrates all functionalities into a single model, improving efficiency and response speed**.
- GPT-4o’s capabilities include **real-time translations, emotion detection in audio, and understanding and interacting with visual inputs** like screenshots and documents.

- It also offers **multilingual support and better performance with non-English texts**, aiming to be more accessible globally.
- The technology behind GPT-4o enables holistic understanding of inputs, **considering factors like tone and background noise**.
- Its **response times are remarkably fast, between 232 to 320 milliseconds**.

Safety measures include **filtered training data and post-training model refinement** to address risks like misinformation and bias.

## 125. DENGUE VACCINE (TAK-003)

### Context:

WHO prequalified the new dengue vaccine, TAK-003. Developed by Takeda, it’s a live-attenuated vaccine containing weakened versions of the four serotypes of the dengue virus.

**TAK-003, developed by Japan’s Takeda, is a live-attenuated dengue vaccine** prequalified by the WHO. It’s recommended for children aged 6–16 in high-burden areas. WHO prequalification assures vaccine quality for UN procurement.

### About Dengue:

**It is caused by four virus serotypes** (Dengue virus named DEN-1, DEN-2, DEN-3, and DEN-4.), and is transmitted by infected mosquitoes. Symptoms include high fever, headache, and muscle pain, potentially fatal. Aedes mosquitoes primarily spread it, with cases mainly in urban areas of Asia, Africa, and the Americas. Other vaccines in the prequalification list target diseases like malaria, yellow fever, and Japanese encephalitis.

## 126. MITOGENOME

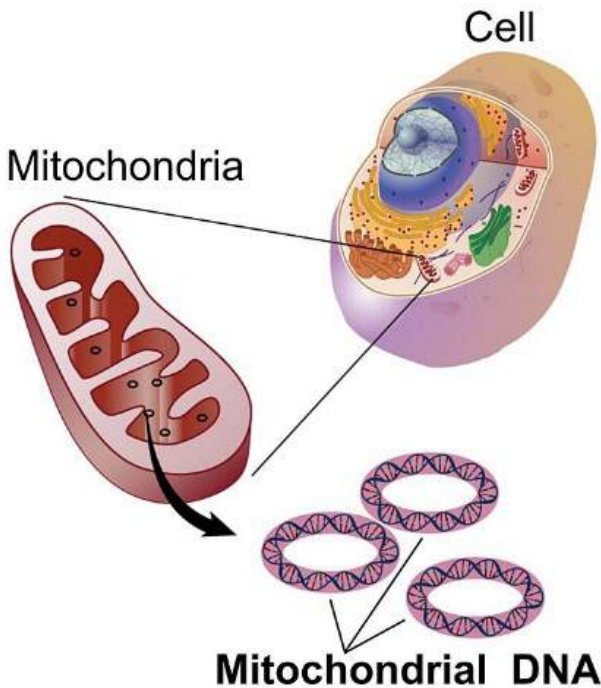
### Context:

A recent study has traced the **ancestry of South African leopards to an ice age**, revealing their origins from two unique clades **in southern and central Africa**.

- This research involved **analysing the mitogenomes—DNA found outside the cell nucleus and inherited maternally**.
- These mitogenomes provide a **reliable record of genetic mutations over time**, allowing scientists to **track the evolution and migration of leopards**.

Mitogenomes, **short for mitochondrial genomes**, are DNA molecules **found outside the nucleus of a cell**, within the **mitochondria**.

Mitochondria are often referred to as the **powerhouses of the cell because they generate the cell’s energy**.



### 127. PLUNGING REGIONS

**Context:**

Researchers from Oxford University have provided the **first observational proof of “plunging regions” around black holes**, confirming a **key prediction of Einstein’s theory of gravity**.

- The study demonstrated that there are **areas near black holes where matter ceases to orbit and plunges directly into the black hole**, experiencing some of the **strongest gravitational forces in the galaxy**.
- It **confirms Einstein’s theory**, which states that **particles close to a black hole cannot maintain circular orbits and instead rapidly fall inwards at nearly the speed of light**.

### 128. LUNAR POLAR EXPLORATION MISSION (LUPEX)

**Context:**

The **India-Japan joint moon mission**, the **Lunar Polar Exploration Mission (LUPEX)**, is **expected to launch in a few years**.

- This collaboration between **the Indian Space Research Organisation (ISRO) and the Japan Aerospace Exploration Agency (JAXA)** aims to **explore the lunar surface and search for subsurface water**.
- ISRO is developing the **lander**, while JAXA is responsible for the **rover and launch vehicle**.
- The mission will also **carry instruments from NASA and the European Space Agency (ESA)**, enhancing its scientific potential.

### 129. AI IN DRUG DEVELOPMENT

**Context:**

AI has significantly enhanced the efficiency and speed of drug development, a traditionally costly and time-consuming process.

**AI Tools in Drug Development:**

**AlphaFold 3 and RoseTTAFold All-Atom:**

- **Developers:** AlphaFold is developed by DeepMind, a Google company, and RoseTTAFold by the University of Washington.
- **Functionality:** These tools use **deep neural networks to predict the three-dimensional structures of proteins and their interactions with drugs**. They provide a major leap in predicting not **just static protein structures but also dynamic interactions with various biological molecules**, including DNA, RNA, and small molecules.
- **Performance:** In tests, **AlphaFold 3 accurately predicted drug interactions 76% of the time, outperforming RoseTTAFold All-Atom at 40%**.

### 130. 50 YEARS SINCE INDIA’S FIRST NUCLEAR TEST

**Context:**

Fifty years ago (1974), India conducted its **first nuclear test, Operation Smiling Buddha**, in Pokhran, marking its entry into the nuclear club.

Led by **Dr H.N. Sethna and Dr R. Ramanna**, the test yielded **successful results in the 10-15 kiloton range**. This made India the first nation, apart from the five permanent members of the UN Security Council, to conduct such a test. In 1998, India conducted a series of nuclear tests, code-named **Operation Shakti**, again in Pokhran, expanding its nuclear capabilities. These tests enabled India to build nuclear weapons with **yields up to around 200 kilotons**.

India’s nuclear doctrine emphasizes building a credible minimum deterrent, adhering to a **“No First Use” policy**, and maintaining civilian political control over nuclear retaliation.

### 131. NASA’S PREFIRE MISSION

**Context:**

Polar Radiant Energy in the Far-Infrared Experiment (PRE-FIRE) polar mission is set to unlock the **mysteries of Earth’s poles by capturing new data on heat emissions**.

Consisting of a **pair of CubeSats**, **PREFIRE will measure far-infrared radiation**, shedding light on how different polar properties contribute to heat dissipation.

### Giant viruses

#### Context:

**Giant viruses, dating back 1.5 billion years**, discovered in Yellowstone’s geothermal springs shed light on Earth’s early conditions.

A giant **virus**, also known as a “**girus**,” is notably large, with some exceeding typical bacteria in size. They are classified within the phylum **Nucleocytoviricota**.

These viruses, **with unusually large genomes, offer insights into the environment during the emergence of life**. Thriving in extreme conditions, they don’t infect humans but may have influenced the **evolution of single-cell organisms**. The study reveals ancient connections between these viruses and hot springs, suggesting their role in ecosystem stability.

**Yellowstone, the oldest US national park**, is renowned for its hot springs and holds UNESCO Biosphere Reserve and World Heritage site status.

## 132. BACTERIAL PATHOGENS PRIORITY LIST (BPPL)

#### Context:

The World Health Organization (WHO) updated its **Bacterial Pathogens Priority List (BPPL), highlighting critical priority pathogens** that pose significant global health threats due to their resistance to treatment and ability to spread resistance.

#### About BPPL:

The Bacterial Pathogens Priority List (BPPL) is **a crucial tool in combating antimicrobial resistance**. Introduced by the **WHO in 2017**, it initially listed 13 bacterial pathogens to guide research and development efforts for new antibacterials.

The 2024 list categorizes **15 families of antibiotic-resistant bacteria** into critical, high, and medium-priority groups to aid in prioritizing responses. Some high-priority pathogens, like **Salmonella and Shigella**, burden low- and middle-income countries, posing challenges in healthcare settings.

Antibiotic resistance, **driven by misuse and overuse of antimicrobials**, makes infections harder to treat and increases the risk of severe illness and death.

**The WHO Bacterial Priority Pathogens List** serves as a vital tool in combating antimicrobial resistance, updating rankings to address evolving threats.

## 133. SPECULOOS- 3 B

#### Context:

Astronomers at the University of Liège in Belgium discovered an **Earth-sized exoplanet, SPECULOOS-3 b**, orbiting an

**ultra-cool red dwarf, 55 light-years away**.

- **Exoplanets:** Planets beyond our solar system, either orbiting other stars or free-floating.
- **Red dwarfs are the smallest main sequence stars**, much smaller than the Sun

The star, roughly the **size of Jupiter and twice as cold as the Sun**, bombards the planet with intense radiation, likely stripping away any atmosphere, and making it uninhabitable. The SPECULOOS project, aimed at studying ultra-cool dwarf stars, previously discovered the **TRAPPIST-1 system**. The newly found exoplanet orbits its star every **17 hours and is tidally locked, with perpetual day and night sides**.

## 134. DOPPLER RADAR SPEED GUNS

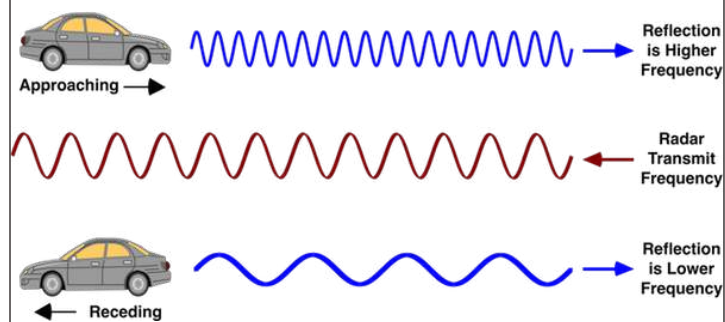
#### Context:

The Consumer Affairs Ministry has **proposed new rules for radar speed guns** used to measure vehicle speeds on roads.

According to the draft rules, **radar equipment installed after the finalization of the rules must be verified and stamped within one year**. Existing equipment should also undergo verification whenever re-verification is due. Conditions are outlined for the use of speed measurement results in legal proceedings.

#### About Doppler radar:

It utilizes the **Doppler effect to collect velocity data**. The Doppler effect, proposed by **Johann Christian Doppler in 1842**, describes the change in **wave frequency** when there’s relative motion between a wave source and its observer. This phenomenon is observed in **sound waves and electromagnetic waves**. Doppler radar finds applications in astrophysics and vehicle speed monitoring by law enforcement.



## 135. VENUS

#### Context:

A new study suggests that **Venus is losing water much faster than previously thought**, with researchers identifying a mechanism in the **Venusian ionosphere responsible** for this accelerated water loss.

Venus may have **once had oceans, but now only 0.002%** of its atmosphere is water vapor. The process of non-thermal hydrogen escape, where solar radiation splits water mole-

cules and hydrogen escapes into space, is a key factor.

**About Venus:**

Venus, the **second planet from the Sun and the closest to Earth**, is renowned as the **brightest planet** in the night sky. It lacks a satellite and its atmosphere is primarily composed of **carbon dioxide**, with clouds of sulfuric acid droplets. Notably, **Venus rotates in the opposite direction to most planets**, from east to west. Alongside Mercury, Earth, and Mars, Venus is classified as a **terrestrial planet**.

### 136. PSYCHEDELIC DRUGS IN INDIA

**Context:**

Driven by the need for better mental health treatments and the low success rate of current medications, researchers are calling for clinical trials of psychedelic drugs in India. P

**About Psychedelics**

Psychedelics are a **class of drugs that alter perception, behaviour, consciousness, and thought**, often intensifying sensory awareness. These drugs, a subset of psychotropic substances, are known for causing vivid hallucinations and drastically changing an individual’s thoughts and perceptions.

**Categories of Psychedelics:**

- **Classical Psychedelics:** Primarily cause hallucinations by activating the serotonin 5-HT receptor, found throughout the body. Examples include LSD, psilocybin, and DMT.
- **Non-Classical Psychedelics:** Interact with various receptors. Notable examples are ketamine and MDMA.

**How do They work?**

Psychedelics typically **enhance serotonin, a mood-stabilizing hormone**, by binding to serotonin receptors on cell surfaces, triggering specific biochemical reactions.

**Research and Clinical Use:** Five psychedelics—psilocybin, LSD, MDMA, ketamine, and DMT—are being extensively studied for treating mental health issues.

**Regulation:** The 1971 UN Convention on Psychotropic Substances regulates about 200 psychotropic substances, categorizing them into four schedules based on abuse potential, with Schedule I being the most restrictive. The convention does not specify the exact number or types classified as psychedelics.

### 137. PRE-ECLAMPSIA

**Pre-eclampsia is a hypertensive disorder of pregnancy** that leads to multiorgan dysfunction in the mother. It typically **manifests after 20 weeks of pregnancy**, characterized by

**high blood pressure**. Other symptoms include **swelling in the face, hands, and feet, severe headaches**, vision changes, upper abdominal pain, and trouble breathing. Studies show that **pre-eclampsia significantly raises the risk of heart failure**, coronary heart disease, stroke, and cardiovascular death in mothers.

**India’s Adverse Pregnancy Outcomes:**

1. India accounts for nearly a quarter of the **world’s adverse pregnancy outcomes**.
2. **NFHS-5 statistics** show perinatal mortality at 32 per 1,000 pregnancies and neonatal mortality at 25 per 1,000 live births.
3. **Hypertensive disorders** in pregnancy are a leading cause of maternal death.

### 138. ARTIFICIAL INTELLIGENCE (AI) ACT

**Context:**

The **European Union** has finalized the **world’s first comprehensive law** regulating **artificial intelligence, known as the AI Act**.

- This legislation **sets strict rules for AI applications**, categorizing them based **on the risks they pose to society**.
- High-risk AI systems, such as autonomous vehicles and medical devices, face stringent evaluations, while **AI applications deemed “unacceptable” like social scoring systems, predictive policing, and emotional recognition are prohibited**.
- Companies violating the AI Act could **face fines of up to 35 million euros or 7% of their annual global revenues**.

The law, aimed at **ensuring trust, transparency, and accountability**, includes provisions for generative AI systems to respect copyright laws and undergo routine testing.

### 139. COPERNICUS-EMS PROGRAMME

**Context:**

The **Copernicus Emergency Management Service (EMS)** rapid response mapping was **activated by the EU** to assist in **locating a helicopter carrying the Iranian President**, which crashed near the Iran-Azerbaijan border.

**About Copernicus programme:**

- The **Copernicus programme** is an EU initiative that **utilizes satellite and ground-based data** to address **climate change, disaster management, and other global challenges**.
- The **Copernicus Emergency Management Service (EMS)** is a component of the **broader Copernicus program**, an **initiative by the European Union (EU)** aimed at **providing comprehensive Earth observation and monitoring services**.

The Copernicus EMS specifically focuses on **delivering timely and accurate geospatial information to support emergency**

response efforts during natural disasters, humanitarian crises, and other emergencies.

## 140. NAEGLERIA FOWLERI

### Context:

A girl from Kerala, has died from amoebic meningoencephalitis, a rare brain infection caused by Naegleria fowleri, known as the 'brain-eating amoeba.'

Naegleria fowleri is a type of amoeba, a unicellular organism found in soil, warm freshwater lakes, rivers, and hot springs.

If this amoeba enters the nose and reaches the brain, it can cause a severe infection known as Primary Amoebic Meningoencephalitis (PAM).

Due to its ability to infect and destroy brain tissue, Naegleria fowleri is often referred to as the "brain-eating amoeba."

While infections caused by this organism are rare, they are almost always fatal.

## 141. FERROPTOSIS

### Context:

A recent study by researchers has identified ferroptosis, an unusual form of cell death, as a significant contributor to lung damage in COVID-19 patients.

- Ferroptosis occurs when the outer fat layers of cells collapse, leading to cell death.
- This differs from the more common type of cell death, where cells break down their internal molecules.
- The study analysed human tissues and autopsies of COVID-19 victims, along with samples from hamsters, revealing that ferroptosis was a primary mechanism behind the lung damage observed.

Ferroptosis is a form of regulated cell death characterized by the iron-dependent accumulation of lipid peroxides to lethal levels.

Unlike other forms of cell death such as apoptosis or necrosis, ferroptosis specifically involves the oxidative damage of lipids within cell membranes, leading to cell membrane destabilization and ultimately cell death.

## 142. MALARIA VACCINE 'R21/MATRIX-M'

### Context:

The Serum Institute of India (SII) has begun exporting the 'R21/Matrix-M' malaria vaccine to Africa, targeting children in malaria-endemic regions.

- Developed in collaboration with the University of Oxford and Novavax's Matrix-M adjuvant.

- It is the second malaria vaccine recommended by WHO in 2023, after RTS, S/AS01 vaccine.

### About Malaria:

- Malaria is a life-threatening disease caused by parasites that are transmitted to people through the bites of infected female Anopheles mosquitoes.
- It is preventable and curable, but it remains a major public health problem, particularly in tropical and subtropical regions.

## 143. GRAPHITE

### Context:

India is discussing with Sri Lanka to acquire graphite mines, aiming to meet the rising demand for graphite, crucial for battery anodes, especially lithium-ion batteries.

- China is the world's largest producer of natural graphite, accounting for two-thirds of global supply.
- While Mozambique, Madagascar, and Brazil are significant non-Chinese producers, China also refines over 90% of the world's graphite for use in EV battery anodes.
- It is among 30 critical minerals declared by India.

### About Graphite:

Graphite is a naturally occurring crystalline form of carbon. It's made up of stacked layers of graphene. Graphite is the most stable form of carbon under standard conditions.

Graphite is a mineral that's found in metamorphic and igneous rocks. It's extremely soft, cleaves with very light pressure, and has a very low specific gravity.

Graphite is a good conductor of electricity and heat. It's also lighter than diamond, smooth and slippery to the touch.

Graphite, a key component in electric vehicle (EV) batteries, has seen a surge in demand due to the growth of the EV industry. The battery end-use market for graphite has grown by 250% globally since 2018

## 144. AVIAN INFLUENZA

### Context:

Australia's first human case of bird flu has been confirmed in a child who contracted the H5N1 virus while in India. The child returned from India in March and fell ill with the flu virus.

Although avian influenza rarely infects humans, it can cause severe illness and has a high mortality rate.

### About Avian influenza:

It is commonly known as bird flu, is a highly contagious viral infection that primarily affects birds, including wild and domestic poultry. The H5N1 strain, first identified in 1996, has a mortality rate of about 60% in humans. Symptoms range

from mild flu-like symptoms to severe respiratory issues and neurological problems. In India, outbreaks of avian influenza have occurred since 2006, with millions of birds culled to control its spread. India's strategy involves detecting and culling infected birds. Antiviral treatments are available for human cases.

Types	A Subtypes	H5A1 vs H5N1
<b>Influenza A</b> (Infects a wide range of animals including birds)	Avian (Can infect humans) H5N1 H7N3 H7N7 H7N9 H9N2 H10N8	H5A1 H5N1 H5N1 H5N1 H5A1 H5N8 H5N1 H5N8
<b>Influenza B</b> (Mainly infects humans)	Swine (Can infect humans) H1N1 H1N2 H3N2	
<b>Influenza C</b> (Infects humans and pigs but more rare than types A and B)	Most common human H1N1 H3N2	
<b>Influenza D</b> (Infects cattle)		

Global efforts to combat avian influenza include the **Global Influenza Surveillance and Response System (GISRS)**, a WHO-led initiative that monitors circulating virus strains and advises on treatment and control measures. Additionally, the **World Organisation for Animal Health (WOAH) collaborates** internationally to enhance animal health. In India, the **National Action Plan for Prevention, Control, and Containment of Avian Influenza** outlines steps to manage outbreaks. India's self-declaration of freedom from **Highly Pathogenic Avian Influenza (HPAI)** in certain poultry compartments was approved by WOA in 2023.

### 145. EVTOL (ELECTRIC VERTICAL TAKE-OFF AND LANDING) AIRCRAFT

**Context:**

IIT Madras-incubated ePlane Company is set to launch eVTOL (electric Vertical Take-Off and Landing) aircraft in Bengaluru.

**What are eVTOLs (electric Vertical Take-Off and Landing aircraft)?**

These are vehicles that can take off and land vertically using **electric propulsion**. They use electric motors to drive rotors or propellers, with energy stored in batteries, typically lithium-ion. eVTOLs are designed to operate in urban areas, reducing traffic congestion, and air pollution, and improving connectivity and emergency services.

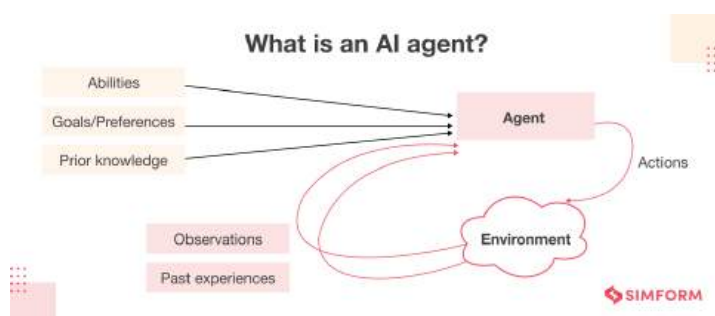


### 146. AI AGENTS

**Context:**

GPT-4o by **OpenAI and Project Astra** by Google represent a new breed of AI known as AI agents.

Unlike conventional voice assistants like **Alexa and Siri**, AI agents can engage in **real-time, multi-modal interactions** with humans, processing various inputs including text, images, and voice. They perceive their environment through sensors, process information using algorithms, and take action. Unlike **large language models (LLMs) such as GPT-3 and GPT-4**, AI agents offer **more natural and immersive interactions**, understanding context and providing personalized responses. They have potential applications in customer service, **education, healthcare, and more**, but also raise concerns about privacy, security, and bias.



### 147. ASTROSAT

**Context:**

AstroSat has facilitated the discovery of 'aperiodic modulation' in high-energy X-ray photons during an 'unusual' outburst phase in a black hole **X-ray binary (BH-XRB) system**

- **BH-XRB system consists of a black hole** and a companion star that is locked in gravitation.

**About AstroSat:**

**It was launched by ISRO in 2015** via PSLV-C30 into Low Earth Orbit and stands as **India's premier multi-wavelength space observatory**. Designed to explore **celestial sources across X-ray, optical, and UV spectral bands** simultaneously, it hosts five payloads for comprehensive multi-wavelength observations. Its objectives include unravelling high-energy processes in binary star systems, identifying new transient X-ray sources, and investigating star birth regions, among others

### 148. NEPHROTIC SYNDROME

**Context:**

A recent study has unveiled a breakthrough in identifying and tracking renal diseases associated with nephrotic syndrome.

Employing a hybrid methodology, scientists discovered that **anti-nephrin autoantibodies** serve as a reliable **biomarker** for monitoring disease progression, offering the potential for personalized therapeutic strategies. **Biomarkers**, like blood pressure, are used in clinical assessments.

**About Nephrotic syndrome:**

It is a kidney disorder characterized **by excessive protein loss from blood into urine**, leading to scarring or damage to the kidney's filtering units called glomeruli. These small blood vessels filter waste and excess water from the blood, excreting them as urine. Various disorders, including diabetes and lupus, can cause nephrotic syndrome by affecting different parts of the body.

**149. HEALTH FOR ALL MANDATE OF WHO**

**Context:**

The World Health Organization (WHO) launched its **inaugural Investment Round to revamp its funding model** in the face of global challenges such as climate change, pandemics, and geopolitical instability.

**What is Health For All?**

The concept of "Health for All" originated from **the Alma-Ata Declaration of 1978** by WHO, emphasizing **Primary Health Care**. The Investment Round, targeting the next four years (2025-2028), aims to raise \$7 billion to bolster countries' capacity to address health challenges.

The initiative, introduced ahead of the **Seventy-Seventh World Health Assembly**, aims to secure **flexible, predictable, and resilient** funding for WHO's strategy from 2025 to 2028. **Brazil, France, Germany, Norway, and Qatar** have pledged their support, with **Brazil** set to host a major pledging event in November.

**Funding for WHO:**

**WHO's funding primarily comes from two sources: assessed contributions**, which are dues paid by member countries based on a **percentage of their GDP**, and **voluntary contributions** from members or other partners. These voluntary contributions include core and specified funds. However, challenges persist **as assessed contributions cover less than 20% of the total budget**, and there are instances of funding withdrawal, such as the temporary suspension by the US.

**About WHO:**

The World Health Organization (WHO), established in **1948**, **is the specialized health agency of the United Nations**. Based in Geneva, Switzerland, it **operates with 194 Member States**, 150 country offices, and six regional offices. Working closely with member states, typically through **Ministries of Health**, WHO leads global health initiatives, sets standards, conducts research, and offers technical support. Its responsibilities include **shaping health policy, advocating**

**evidence-based practices**, and monitoring health trends. **World Health Day**, celebrated annually on **April 7th**, marks the organization's founding date.

**150. GOLDEN RICE**

**Context:**

The Philippine Court of Appeals recently **revoked biosafety permits** for the commercial production of **genetically modified golden rice and Bt eggplant**. The court cited the government's failure to establish **safety monitoring mechanisms**.

**About Golden Rice:**

Golden Rice (approved for commercial production in 2021) is **genetically engineered to contain beta carotene**, giving it a yellow-orange colour. Unlike ordinary rice, which **does not have beta carotene** in its grain, Golden Rice's beta carotene is identical to that found in vegetables and fruits. It does not require special cultivation practices and has the **same yield and taste as regular rice**. This rice is a valuable tool in combating **Vitamin A deficiency**, which is crucial for growth, immune health, and vision.

**151. ASTRONOMICAL TRANSIENTS (2024 SHAW PRIZE FOR ASTRONOMY)**

**Context:**

Shrinivas Kulkarni has won the **2024 Shaw Prize for Astronomy** for his studies of astronomical transients.

**His contributions:**

Recognized for pioneering research on millisecond pulsars, gamma-ray bursts, supernovae, and other transient astronomical objects. He led the development of the Palomar Transient Factory and Zwicky Transient Facility, transforming our comprehension of the time-variable optical sky.

**About Astronomical Transients**

Astronomical transients are celestial objects that undergo rapid changes in brightness, often associated with violent space events. Astronomers study them to understand their origins and mechanisms, providing insights into stable astronomical phenomena.

**Examples:**

1. **Supernovae:** Explosions resulting from large stars exhausting fusible elements, sometimes outshining entire galaxies due to their intense brightness.
2. **Active Galactic Nucleus (AGN):** Supermassive black holes at the centres of galaxies actively consume matter, causing fluctuations in brightness.
3. **Fast Radio Burst (FRB):** Discovered in 2007, emitting energy exceeding ten times that of the sun in milliseconds.

**About the Prize:**

Founded by **Mr. Run Run Shaw in 2002**, the Shaw Prize celebrates outstanding achievements in **astronomy, life science and medicine**, and **mathematical sciences**. Each year, the Prize honours individuals who have made significant contributions to their fields, promoting excellence and societal progress.

offers significantly better coverage than existing missions and is expected to discover **thousands of GRBs and dozens of high-energy counterparts** to binary neutron star mergers over a five-year mission.

**Other Gamma Ray Detection Missions:**

1. **Astrosat**: India’s multi-wavelength space observatory.
2. **Fermi Gamma-ray Space Telescope**: NASA’s wide-range gamma-ray observatory.
3. **Swift Observatory**: NASA’s mission to study gamma-ray bursts.

**152. CYBERCRIMES FROM SOUTHEAST ASIA**

**Context:**

Criminals based in Southeast Asia, particularly in **Myanmar, Laos, and Cambodia**, are orchestrating online scams that have caught a significant number of Indians.

According to the **Indian Cybercrime Coordination Centre (I4C)**, **46%** of reported frauds from January to April, amounting to a staggering **Rs 1,776 crore in losses**, originated in these countries.

**Types of Crimes:**

Types	Description
<b>Trading Scam</b>	Scammers use <b>social media to advertise free trading tips</b> , falsely using well-known stock market experts to lure victims into exclusive groups.
<b>Digital Arrest</b>	Victims receive <b>misleading calls claiming their involvement with illegal packages</b> , with impersonators posing as law enforcement officials demanding money to resolve these fabricated issues.
<b>Investment Scam</b>	Individuals are <b>promised easy money for completing simple online tasks</b> aimed at boosting social media ratings.
<b>Romance/Dating Scam</b>	Scammers create <b>fake online dating profiles</b> to establish romantic relationships, then concoct emergencies that supposedly require financial assistance.

**153. DAKSHA PROJECT**

**Context:** The Daksha project aims to **build two high-energy space telescopes** to study explosive astrophysical sources like **gamma-ray bursts (GRBs)** and electromagnetic counterparts to gravitational wave sources.

Each telescope will have sensors covering **1 keV to > 1 MeV**. With two satellites orbiting opposite sides of Earth, Daksha

**Context:**

Japanese researchers from Kyoto University and Sumitomo Forestry have developed the **world’s first wooden satellite, LignoSat**.

This tiny cuboid craft, made from **magnolia wood**, measures 10 centimetres on each side and will be launched on a **SpaceX rocket in September**. The wooden material is expected to burn up **completely upon re-entry**, avoiding the creation of harmful metal particles.

**154. LIGNOSAT**

**155. ZERO DEBRIS CHARTER**

**Context:**

Recently, **twelve nations** signed the **Zero Debris Charter** at the **ESA/EU Space Council**, committing to making space activities debris-neutral by 2030.

The signatories include **Austria, Belgium, Cyprus, Estonia, Germany, Lithuania, Poland, Portugal, Romania, Slovakia, Sweden, and the United Kingdom**, alongside the European Space Agency (ESA) as an International Organisation. This initiative, first introduced at the **ESA Space Summit in November 2023**, aims to lead global efforts in space debris mitigation and remediation.

**What is the Zero Debris Charter?**

The **Zero Debris Charter aims** to achieve debris-neutrality in space by 2030. The Charter is part of ESA’s comprehensive **Zero Debris approach**, which involves significant internal reforms and the development of debris mitigation technologies under its Space Safety Programme. ESA estimates **over one million pieces of space debris** larger than one-centimetre orbit Earth, posing severe risks to satellites and astronauts.

**Space debris, comprising non-functional objects in Earth orbit**, poses threats to infrastructure and increases collision risks. India’s initiatives **include Debris Free Space Missions (DFSM) by 2030** and **Project NETRA** for space situational awareness. Globally, efforts like the **Inter-Agency Space Debris Coordination Committee** and **Space Debris Mitigation**

**Guidelines** are crucial for addressing this issue.

Environment & Ecology

### 156. GOLDMAN ENVIRONMENTAL PRIZE

**Context:**

Alok Shukla, a forest and **tribal rights activist of Chhattisgarh Bachao Andolan**, has won the **2024 Goldman Environmental Prize** for his campaign saving over 4 lakh acres of forests in **Chhattisgarh's Hasdeo Aranya region** from 21 planned coal mines.

The Hasdeo Aranya forests, spread across **1.70 lakh hectares in Chhattisgarh**, are vital for biodiversity, home to 25 endangered species, 92 bird species, and 167 rare plants. The **Hasdeo River**, fed by these forests, irrigates 741,000 acres of farmland. Chhattisgarh, with **44% forest coverage**, ranks third in India.

The award, also known as the **Green Nobel**, is given by the **Goldman Environmental Foundation to grassroots environmental leaders** worldwide, with winners receiving USD 200,000.

### 157. BATILLIPES CHANDRAYAANI

**Context:**

A **new marine tardigrade species** discovered off the south-east coast of Tamil Nadu has been named **Batillipes chandrayaani after the Chandrayaan-3 moon mission**.

It is the **third marine tardigrade species** scientifically described from Indian waters. It features a **trapezoid-shaped head and four pairs of legs** with sharp-tipped sensory spines.

**What are Tardigrades (also known as "water bears")?**  
They are **near-microscopic aquatic animals** with plump, segmented bodies and flattened heads. They are renowned for their resilience and are among the hardest animals (surviving mass extinctions and environmental extremes), with marine tardigrades comprising **17% of all known tardigrade species**.

### 158. BHADRA TIGER RESERVE

**Context:**

Bhadra Tiger Reserve in Chikkamagaluru is attracting more tourists, scientists, and photographers.

**About Bhadra Tiger Reserve:**  
Situated in the **Western Ghats region of Karnataka, Bhadra Tiger Reserve** is unique for being nestled within several hill ranges. It has served as both an **Elephant Reserve** and the 25th **Project Tiger Reserve of India since 1998**, boasting a

substantial tiger population.

Well-drained by the **river Bhadra and its tributaries**, it features a variety of vegetation including dry-deciduous, moist-deciduous, shola, and semi-evergreen patches. Other Tiger Reserves in Karnataka include **Bandipura**, Nagarahole, **Dandeli-Anshi**, and Biligiriranga Tiger Reserve.

### 159. GLOBAL BIOFUEL ALLIANCE (GBA)

**Context:**

The Global Biofuel Alliance (GBA) outlined a work plan at a recent meeting, focusing on assessing **country landscapes, drafting policy frameworks, and conducting biofuel workshops**.

India proposed **three workstreams to support biofuel trade, raise awareness, and enhance adoption**. However, uncertainty persists regarding the launch date and location of the GBA's new secretariat and governance structure.

**The Global Biofuel Alliance (GBA)** was launched to accelerate the global adoption of biofuels during India's G20 presidency (October 2023). It unites major biofuel producers and consumers like the US, Brazil, and India. **Nineteen countries and 12 international organizations** have committed to joining or supporting the GBA. Its goal is to enhance global bio-fuels trade for a more sustainable future.

### 160. INDIA IS NOW THE WORLD'S THIRD-LARGEST SOLAR POWER GENERATOR

**Context:**

India surged past Japan to become the **world's third-largest solar power generator** in 2023, driven by rapid solar energy deployment. **China and the USA** are two major producers ahead of India in 2023. In terms of installed solar power capacity, **India ranks fifth in the world while Japan is in third place (83 GW)**

**As per the Global Electricity Review (GER) 2024 report** by Ember, renewables contributed **30% of global electricity for the first time**, with solar leading electricity growth in 2023.

**India witnessed the world's fourth-largest surge** in solar generation, providing **5.9%** of global growth. Despite challenges such as drought affecting hydropower and a rise in coal generation, India aims to decarbonize its power sector by reducing carbon intensity, achieving **50% renewable energy by 2030, and net-zero emissions by 2070, targeting 500 GW of renewable energy capacity by 2030**.

## 161. SPERM WHALE

### Context:

Scientists have uncovered a fascinating aspect of sperm whale communication: **their complex vocalizations resemble Morse code**, hinting at a sophisticated **“phonetic alphabet.”**

These whales, renowned for their social nature, **use clicking sounds called codas to convey messages**. Research on sperm whales in the **eastern Caribbean revealed a rich communication system akin to human language**.

**Sperm whales are the largest toothed whales**, predominantly observed in polar regions. They inhabit **deep open waters and coastal areas**, facing threats such as vessel strikes and entanglement in fishing gear. Listed as Vulnerable by the **IUCN and under Schedule II of the Wildlife (Protection) Act, 1972** in India, they require conservation efforts to safeguard their populations.

## 162. 46TH ANTARCTIC TREATY CONSULTATIVE MEETING

### Context:

India, **through the Ministry of Earth Sciences (MoES) and the National Centre for Polar and Ocean Research (NCPOR)**, is set to host the **46th Antarctic Treaty Consultative Meeting (ATCM 46) and the 26th Meeting of the Committee for Environmental Protection (CEP 26)**.

- The Antarctic Treaty, signed in 1959, established **Antarctica as a region for peaceful purposes, scientific cooperation, and environmental protection**.
- In **2022, India enacted the Antarctic Act**, reaffirming its commitment to the Treaty.

Key items on the agenda include sustainable **management of Antarctica, biodiversity prospecting, climate change response, tourism framework development, and conservation of Antarctic biodiversity**.

## 163. RED COLOBUS MONKEYS

### Context:

Conserving, is crucial for protecting the continent’s tropical forests, according to a recent study of **red colobus monkeys, spread across Africa**

### About the Red Colobus monkey:

**It is a member of the Colobine group**, primarily feeds on leaves and is native to western, central, and eastern Africa, ranging from Senegal to the Zanzibar Archipelago. Found in habitats like humid forests and coastal thickets, they are listed as one of the **world’s 25 most endangered primates by the IUCN**. They have distinctive brown and orange coats, lack thumbs, and mainly consume young leaves, flowers, and

unripe fruit, with charcoal or clay aiding in digestion.



## 164. MAMMOTH (WORLD’S LARGEST DIRECT AIR CAPTURE AND STORAGE (DAC+S) PLANT)

### Context:

The **world’s largest Direct Air Capture and Storage (DAC+S) plant**, Mammoth, has commenced operations in **Iceland**.

This **Swiss company Climeworks’ second commercial DAC+S facility surpasses its predecessor, Orca**, in size.

### What is a Direct Air Capture and Storage (DAC+S) plant?

Direct Air Capture and Storage (DAC+S) is a technology **designed to remove carbon dioxide (CO2) directly from the atmosphere at any location**. It is a form of Carbon Dioxide Removal (CDR) technology, distinct from carbon capture methods typically carried out at the point of emissions. The **captured CO2 can then be permanently stored in deep geological formations** or utilized for various applications. DAC+S plants aim to contribute to efforts to **reduce CO2 levels in the atmosphere**, addressing climate change concerns.

## 165. OLEANDER FLOWERS

### Context:

Kerala temples ban oleander flower offerings following a woman’s suspected poisoning death from consuming oleander leaves.

**Oleander is a poisonous plant known scientifically as Nerium oleander**. It contains toxic compounds throughout its parts, including leaves and flowers. Ingestion of oleander can lead to symptoms such as **vomiting, nausea, bloody diarrhoea, and irregular heart rhythm**.

They are **fast-growing evergreen shrubs or small trees native to Europe and Asia**. In Kerala, they are also called **arali and kanaveeram**. Oleander is tolerant to heat, drought, wind, air pollution, salt, and poor soil.



## 166. ORANGUTAN DIPLOMACY

### Context:

Malaysia's "**orangutan diplomacy**" aims to use the endangered species as diplomatic gifts to trade partners who buy the country's palm oil, hoping to improve its image amid accusations of unsustainability.

Inspired by China's successful "**panda diplomacy**," Malaysia sees orangutans as a way to signal commitment to certain values.

**Orangutans, the only great apes found outside of Africa,** inhabit Sumatra and Borneo in Southeast Asia. They prefer tropical forests, particularly in river valleys and floodplains. With an extremely low reproductive rate, their populations are highly vulnerable. All three species are classified as **Critically Endangered on the IUCN Red List.**



## 167. ARMoured SAILFIN CATFISH (ASC)

### Context:

**CSIR-Centre for Cellular and Molecular Biology (CCMB) scientists** discovered that the armoured sailfin catfish has infiltrated 60% of Eastern Ghats water bodies, causing damage to fishing nets and the ecosystem.

About **Armoured sailfin catfish (ASC)**, also known as Rakashi or devil fish:

It was initially **brought to India for its distinctive appearance and algae-cleaning abilities** but has since multiplied significantly. **Native to South America**, it belongs to the largest catfish family.



Scientists employed the **Environmental DNA (eDNA) approach** to track the invasive species' spread. eDNA refers to **organismal DNA** released into the environment via cellular material shed by organisms. This method, unlike conventional approaches, is **reliable, accurate, and cost-effective.** Invasive species, as defined by **the Wildlife Protection Act, 1972 (amended in 2022)**, pose a threat to wildlife and their habitats.

## 168. SEA ANEMONE

### Context:

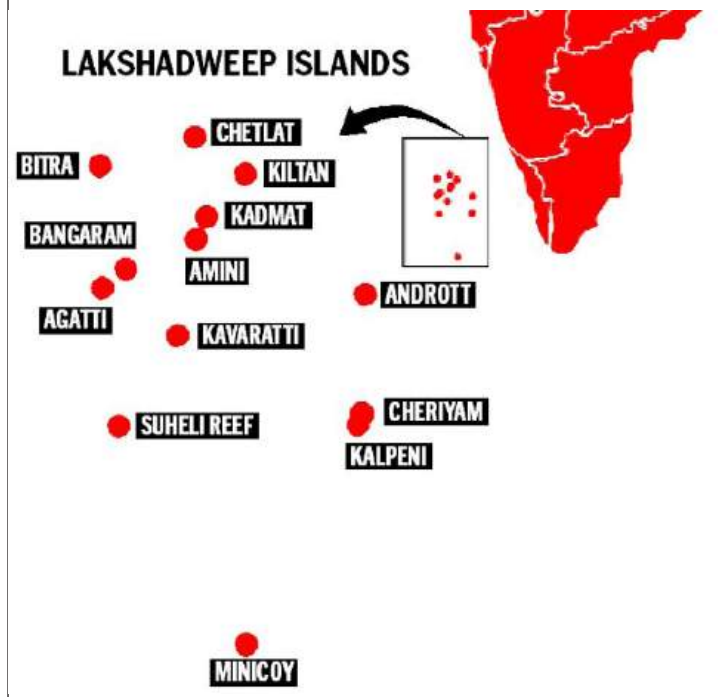
Scientists at the **ICAR-National Bureau of Fish Genetic Resources (NBFGR)** have discovered mass sea anemone bleaching off Agatti island in the Lakshadweep group.

### About Sea anemones:

They belong to the **phylum Cnidaria**, and reside in ocean waters, mainly in coastal tropical regions. Establishing **symbiotic relationships** with green algae, akin to corals, they face bleaching when sea surface temperatures rise. Additionally, they **form symbiotic bonds with clownfish**, providing protection in exchange for food from the clownfish's meals. Sea anemones play vital biogeochemical roles in benthic ecosystems.



**Agatti Island, situated 459 km (248 nautical miles) west of Kochi, Kerala**, and adjacent to Kavaratti Island, the capital of Lakshadweep Union Territory, spans an area of **3.84 sq km**. Its lagoon, covering **17.50 sq km**, hosts vibrant coral growth and multicoloured fish. Fishing dominates its economy, with Agatti being one of the few islands, along with Minicoy, to yield surplus fish. Coir and copra production follow fishing as key industries on the island.



## 169. CONCENTRATION OF CARBON DIOXIDE (KEELING CURVE)

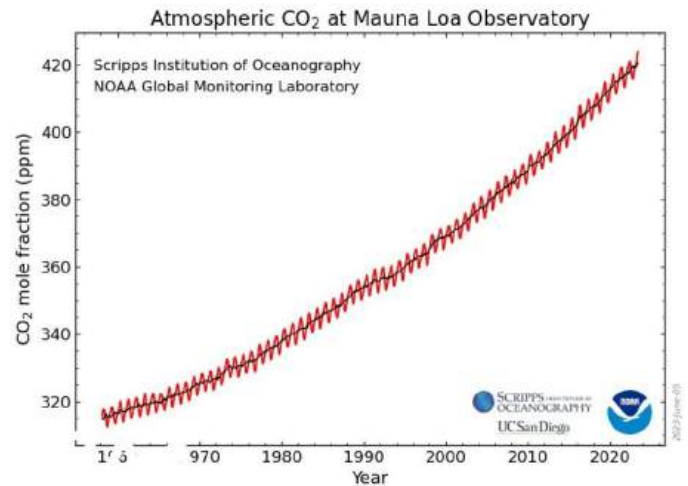
### Context:

In March 2024, the **monthly average concentration of carbon dioxide at NOAA's Mauna Loa Observatory spiked by 4.7 parts per million** compared to March 2023, marking the largest year-over-year gain ever recorded.

This surge, attributed to ongoing global fossil fuel consumption, surpassed the previous record set **during the 2015-2016 El Niño**. The acceleration in CO<sub>2</sub> growth, exacerbated by El Niño events, **intensifies the atmosphere's heat-trapping ability** and contributes to ocean acidification.

### About Keeling Curve:

**The Keeling Curve is a record of atmospheric carbon dioxide (CO<sub>2</sub>) concentrations** measured at the Mauna Loa Observatory in Hawaii. It was initiated by scientist Charles David Keeling in 1958.



### About NOAA:

The National Oceanic and Atmospheric Administration is a Washington, D.C.-based scientific and regulatory agency within the United States Department of Commerce, a United States federal government department.

## 170. ANCIENT BAOBAB TREES

### Context:

Scientists have unravelled the origins of **ancient baobab trees**, revealing they first appeared in **Madagascar 21 million years ago** before spreading to Australia and mainland Africa via ocean currents.

**Baobabs, dubbed "the tree of life" for their unique shapes and longevity**, face threats from climate change and deforestation.

[Previous related News about Baobab Tree:](#)

**Baobab trees**

**Context:** The Madhya Pradesh government has decided that the forest department cannot grant permission for the translocation of Baobab trees in Dhar, after the protest from Bhil tribes.



Under the Biodiversity Act, any commercial use of the trees will require permission from the state biodiversity board

Baobab Trees	
Baobab trees are <b>deciduous trees</b> found in mainland <b>Africa, Madagascar, and Australia</b> . They have <b>barrel-like trunks</b> (5 to 20m in height), can live up to <b>2,000 years</b> , and are known for their extraordinary longevity.	
Tree of Life	Baobabs are <b>succulent trees that store water in their trunk</b> , allowing them to produce nutrient-dense fruit in dry seasons; it has pendulous flowers pollinated by bats and bush babies
Uses	Provide food, livestock fodder, medicinal compounds, and raw materials.
Threat	Since 2005, <b>9 of the 13 oldest African baobab specimens</b> and 5 of the 6 largest trees have <b>died or suffered a collapse</b> , possibly due to climate change.
IUCN Status	<b>Endangered</b>
GI Tag	<b>Madhya Pradesh</b> government has applied for a GI tag for Baobabs.
About Bhil Tribe	Bhil are one of the <b>largest tribal groups</b> , living in Chhattisgarh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Andhra Pradesh and Rajasthan. The name is derived from the word 'billu', which means <b>bow</b> . They are skilled in <b>archery and has deep knowledge</b> of their local geography. Traditionally experts in guerrilla warfare, they are <b>now primarily farmers and sculptors</b> .



**171. SEMAL TREES**

**Context:**

Semal trees, crucial to **Udaipur's Holi festivities**, face peril in south Rajasthan. Despite their ecological significance, thousands are cut annually for **bonfires, violating forest laws**.

Semal trees, also known as **silk cotton trees or Bombax Ceiba**, are **large**, fast-growing trees (large deciduous trees, known for their **Crimson red flowers**) native to India. Ayurvedic medicines can be prepared from every part of the tree (e.g., roots are used for treating ailments such as diabetes, etc). It is worshipped by **many tribal communities in Rajasthan (e.g. Garasia tribe, Kathodi tribe) and Madhya Pradesh**. Its seed produces edible oil, used in **making soaps**. Semal plays a crucial role in the forest ecosystem, providing habitat and food for various species, including rock bees, moths, sparrows, and bugs. Additionally, tribal communities rely on Semal for food, crafting, and cultural beliefs.

**172. WORLD BEES DAY**

**Context:**

The UN designated **20 May as World Bee Day** to raise awareness and protect pollinators. The 2024 theme, **"Bee Engaged with Youth,"** emphasizes involving young people in conservation.

**Honey bees, with three pairs of legs, four wings, and five eyes**, perform a **"waggle dance"** to communicate food source locations. They **produce propolis**, a resinous substance that seals hive cracks, protects against invaders, and prevents bacterial and fungal buildup.

**The Importance of Bees and Pollinators**

1. Bees, butterflies, bats, and hummingbirds are crucial for pollination.
2. **90% of wild flowering plants**, 75% of food crops, and 35% of agricultural land rely on animal pollination.
3. **Pollinators are vital for food security** and biodiversity conservation.
4. **Threats to Pollinators:** Human activities like habitat destruction, pesticides, and climate change threaten pollinators.
5. **Actions to Protect Pollinators:** Plant diverse native plants, avoid pesticides, and buy local honey. Governments should involve local communities, enforce protective measures, and encourage sustainable practices.

**Initiatives:**

1. The **International Pollinator Initiative** promotes sustainable pollinator use.
2. FAO provides technical assistance for sustainable beekeeping and honey production.

**Previous news:**

**Bees**

A report highlighted, that the **biodiversity of the bee population is essential to preserving the ecosystem function of crop pollination, which is crucial to the availability of food for humans**

**Threats to Bees:** habitat loss, invasive species, pesticides, genetic diversity, climate change, pathogens/parasites.

**The Journey from Nectar to Honey:** Nectar → Honey → Bees in the hive fan their wings to dehydrate the nectar. It becomes honey when the hive interior is 95 F and moisture level is 17%.

**Ecosystem Services provided by Bees:** Cultural Services (Apt-tourism, Education and Science, Spiritual Values), Regulating Services (Pollination, Biodiversity and Conservation, Mitigation by sustainable conservation), Provisioning Services (Bee Products: Bee Wax, Honey, Propolis, Bee Pollen, Bee Venom, Royal Jelly, Bee Bread).

**Worker Bee Anatomy:** Abdomen, Thorax, Head, Single eye, Antennae, Compound eye, Heart, Stinger, Salivary gland, Mouthparts, Pollen basket, Honey stomach, Ganga, Hindgut.

**173. PURNIMA DEVI BARMAN WINS THE 2024 WHITLEY GOLD AWARD**

**Context:**

Dr Purnima Devi Barman from India has been awarded the **2024 Whitley Gold Award (dubbed 'Green Oscar')** by the **UK charity Whitley Fund for Nature (WFN)** for her efforts to save the **Greater Adjutant Stork (Hargila)**.

**Conservation Efforts:**

Barman’s campaign has increased the **stork population in Assam from 450 to over 1,800**. She has mobilized **10,000 rural women, known as “stork sisters,”** to protect nesting sites and rebrand the stork from a bad omen to a cultural symbol. The project has planted 45,000 saplings and rescued over 500 chicks. The global population of the stork has increased to approximately 3,180 birds.

**About Greater Adjutant Stork**

1. **Distribution:** Known as ‘Hargila,’ primarily found in Assam (80%) and Bihar, India, and Cambodia.
2. **Habitat:** Wetlands, nests in tall trees with closed canopies and bamboo clumps.
3. **Threats:** Hunting, habitat destruction, felling of nest trees, and wetland degradation.
4. **Conservation Status:** IUCN: Nearly Threatened (NT).
5. **Significance:** The Greater Adjutant Stork plays a vital role in nutrient recycling and maintaining ecosystem health.



**174. MANIPURI PONY**

**Context:**

Manipur has taken decisive steps to safeguard its iconic Manipuri Pony, known as Meitei Sagol, from extinction.

**About Meitei Sagol:**

It is one of India’s seven recognized horse and pony breeds, and is known for its short stature yet remarkable attributes like stamina, agility, and intelligence. Originating from Manipur, they are esteemed as the **original polo pony**, tracing back to the traditional Sagol Kangjei sport.



However, their population faces threats such as **habitat shrinkage and the lack of polo grounds**. To address these challenges, the Manipur government declared them an **Endangered Breed in 2013** and introduced the **Manipuri Pony Conservation and Development Policy in 2016**. Recent resolutions aim to safeguard the breed, including immediate actions for pony protection, forming a task force, and conducting a comprehensive census.

**175. SHALLOW AQUIFER MANAGEMENT (SAM)**

**Context:**

Telangana is implementing **Shallow Aquifer Management (SAM) pilot** models in Habsiguda and Sainikpuri to address groundwater depletion and flooding.

**What is an Aquifer?**

An aquifer is an underground layer of permeable rock, soil, or sand that holds water and allows it to flow freely. It acts as a natural reservoir, storing groundwater that can be accessed through wells for various purposes like drinking water supply, irrigation, and industrial use.

**What is SAM?**


SAM is a sustainable urban water management technique under the **AMRUT scheme**. It drills shallow borewells to pump out water, recharging aquifers during rainfall and raising water tables.

**176. INTERNATIONAL SOLAR ALLIANCE**

**Context:**

Spain has become **the 99th member of the International Solar Alliance (ISA)**. Spain handed over the ISA Instrument of Ratification during a meeting between Spain’s Ambassador to India

Previous News about [ISA](#):

ISTAR-C and ISA	
<b>Context:</b> India is considering expanding its solar STAR-C initiative to several Pacific Island nations	
ISA Solar Technology and Application Resource Centre (ISTAR C) is one of the initiative of International Solar Alliance (ISA) with the aim to build a network of <b>technical training, entrepreneurship, sharing best practices and establishing research centers</b> to promote knowledge dissemination and capacity-building for solar technology.	
Other such initiatives of ISA	Indian Technical and Economic Cooperation (ITEC) Scheme (for training to master trainer in solar technology); One Sun One World One Grid (OSOWOG)
About ISA	The International Solar Alliance (ISA) (founded in 2015 at London; HQ: Gurugram, Haryana) is an alliance of more than 120 signatory countries, which lie either completely or partly between the <b>Tropic of Cancer and the Tropic of Capricorn</b> . 
Nature	The alliance is a <b>treaty-based inter-governmental organization</b> .
Objective	The primary objective of the alliance is to work for efficient consumption of solar energy to reduce dependence on fossil fuels.
Founders	India and France
Vision	"Let us together make the sun brighter."
Mission	Facilitate energy access, ensure energy security, and drive energy transition in member countries.
Administration	ISA is headed by the Director General. The Director General leads the operations and carries out the functions of the ISA Secretariat. He is responsible to the <b>ISA Assembly</b> . He has a term of <b>four years and is eligible for re-election</b> .
Eligibility	All member states of the United Nations are eligible to join the ISA. Countries that do not fall within the Tropics can join the alliance and enjoy all benefits as other members, with the <b>exception of voting rights</b>
Observer Status	At the United Nations General Assembly (UNGA) <a href="#">Visit Insights IAS Daily Current Affairs</a>

## 177. CENSUS TO ESTIMATE BLUE SHEEP AND HIMALAYAN IBEX

**Context:**

The census to estimate blue sheep and Himalayan ibex populations has begun in **Himachal Pradesh's Lahaul & Spiti district**. Wildlife authorities are using the double observer survey technique to conduct the survey in the challenging terrain

**About Blue Sheep:**

The **Bharal, or blue sheep**, is a **Himalayan caprine species** with the scientific name *Pseudois nayaur*, the sole member of its genus. Found in the **high Himalayas**, it inhabits regions across **India, Bhutan, China, Myanmar, Nepal, and Pakistan**. Bharal are medium-sized, with males slightly larger than females, and sport a slate grey coat with white underparts and black markings. Their **distinctive horns curve** upwards and then backwards. **Bharal are diurnal and active throughout** the day, grazing and resting on mountain slopes. They are classified as **Least Concern on the IUCN Red List** and are protected under the Wildlife Protection Act of 1972 in India.


**About Himalayan Ibex:**

The **Himalayan ibex**, a subspecies of the **Siberian ibex**, is native to the Himalayan region spanning India, Pakistan, Tibet, and Nepal. Scientifically known as *Capra sibirica* *himalayanus*, it thrives in **high-altitude areas between 3,000 and 5,800 meters**. In India, it's primarily found in **Jammu and Kashmir, Himachal Pradesh, and Uttarakhand**. These sturdy wild goats **weigh about 90 kg**, stand 40 inches tall, and sport large curved horns with notches. Their coat ranges from **light brown to reddish-brown**, with a woolly texture in winter. Typically found in small herds, they can reach **speeds of up to 50 km/h**. The Himalayan ibex is classified as **Near Threatened on the IUCN Red List**.



## 178. SYMPATRIC SPECIATION

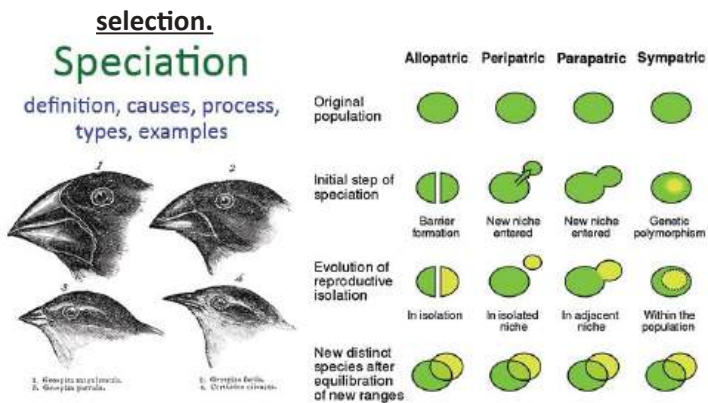
**Context:**

A study by **researchers at IIT Bombay**, challenged the **traditional view that new species can only develop in geographically isolated areas** (allopatric speciation).

- Instead, it demonstrates that **new species can evolve in the same area without geographic barriers**, a process **known as sympatric speciation**.
- The study used a **genetic-based model focusing on birds** to investigate **how environmental resources, genetic factors, and mating preferences contribute to sympatric speciation**.

**Key findings include:**

- **Disruptive Selection:** Variations in **environmental resources** lead to **different traits being favoured, such as birds developing different beak sizes to utilize specific food resources**. This helps maintain distinct groups within the same population.
- **Sexual Selection:** Contrary to previous beliefs, **mating preferences based on advantageous traits** (like beak size) rather than arbitrary traits (like feather colour) drive sympatric speciation.
- **Genetic Architecture:** The genetic control of traits significantly **impacts the likelihood of new species forming**. Genetic flexibility in traits like **beak size facilitates speciation even with minimal disruptive**



### 179. COMBATING OIL SPILLS AT SEA

**Context:**

The [Indian Coast Guard \(ICG\)](#) organised a ‘Pollution Response Seminar and Mock Drill’ recently.

Topic	Details
<b>What is an Oil Spill?</b>	The release of <b>liquid petroleum hydrocarbons into the environment, especially marine areas</b> , from tankers, platforms, rigs, or wells.
<b>Substances</b>	Refined products like gasoline, diesel, bunker fuel, or oily refuse.
<b>Examples of Incidents</b>	<b>International:</b> El Palito refinery (Venezuela, 2020), MV Wakashio (Mauritius, 2020), Norilsk diesel spill (Russia, 2020), Deepwater Horizon (Gulf of Mexico, 2010) <b>India:</b> <a href="#">Chennai</a> (2023 and 2017), Sundarban (2014), ONGC Uran (2013), Mumbai (2010)
<b>Damage</b>	<b>Environmental:</b> Harm to fish, birds, and mammals; habitat contamination; <b>Fisheries:</b> Reduced fish populations, damaged fishing gear; <b>Tourism:</b> Decline due to polluted beaches; <b>Health:</b> Toxic exposure causing respiratory problems, and skin irritation.
<b>International Efforts for Oil Spill Management</b>	<b>MARPOL (1973):</b> International Maritime Organisation’s convention to prevent pollution from ships (India is a signatory); <b>Oil Pollution Preparedness, Response and Cooperation Convention (1990):</b> Framework for international cooperation and mutual assistance in oil spill response (India is a signatory)

<b>Indian Efforts for Oil Spill Management</b>	<b>National Oil Spill Disaster Contingency Plan (NOS-DCP):</b> Managed by the Indian Coast Guard, it ensures effective spillage reporting, prompt response, public health protection, and use of science and technology; <b>Merchant Shipping Act, 1958:</b> Grants the government authority to enforce compliance with shipping regulations to prevent oil spills.
<b>Control Measures for Oil Spills</b>	<b>Bioremediation:</b> Using microorganisms to remove toxins (e.g., TERI’s Oil Zapper bacteria). <b>Oil Booms:</b> Floating barriers to contain spills. <b>Dispersants:</b> Chemicals sprayed to aid natural oil breakdown.

### 180. MANGROVE ECOSYSTEM

**Context:**

The first **global mangrove assessment by the International Union for Conservation of Nature (IUCN)**, warns of the imminent collapse of South India’s mangrove ecosystems due to pollution, deforestation, and coastal development.

- Unlike the ecosystems in **western and eastern India**, those in the south are highly vulnerable to collapse, threatened further by rising sea levels and severe storms linked to climate change.

**The IUCN Red List of Ecosystems (RLE)** has assessed mangrove ecosystems globally for the first time, revealing alarming findings.

1. **Half of the assessed global mangrove ecosystems** are at risk of collapse, with nearly 20% classified as high risk.
2. **Major threats include** climate change, deforestation, development, pollution, and dam construction.
3. **Climate change** alone jeopardizes **one-third of assessed mangrove** ecosystems.
4. **Sea-level rise** is predicted to submerge 25% of global mangrove area in the next 50 years.
5. **Without significant intervention, by 2050**, climate change and sea-level rise could lead to the **loss of 1.8 billion tonnes of stored carbon and expose 2.1 million lives** to coastal flooding.
6. **Indian mangroves vary in status:** Andaman and Bay of Bengal are classified as Least Concern, while South India is Critically Endangered, and West India is Vulnerable.

**Mangroves play a crucial role in disaster risk reduction**, carbon sequestration, and supporting biodiversity and fisheries.

**Initiatives for Mangroves:**

**Global:**

1. **Mangrove Breakthrough:** Introduced at UNFCCC COP27 by UN High-Level Climate Champions and Global Mangrove Alliance (GMA).
2. **Global Mangrove Alliance (GMA)** was established at

the World Ocean Summit in 2018.

3. **Mangrove Alliance for Climate:** Led by UAE in collaboration with Indonesia.

**India:**

1. **Mangrove Initiative for Shoreline Habitats & Tangible Incomes (MISHTI).**
2. **Conservation and Management of Mangroves and Coral Reefs** under National Coastal Mission Programme.

## 181. CLIMATE LITIGATION

**Context:**

**Environmental activists have sued Norway**, challenging its proposal for seabed mineral exploration, claiming inadequate impact assessment. Norway’s parliament approved the plan in January, citing minimal impact from the study.

**Deep-Sea Mining Explained**

1. Involves extracting minerals from the ocean floor.
2. **Types:** Polymetallic nodules, seafloor sulphide deposits, cobalt crusts.
3. **Materials:** Nickel, cobalt, rare earth elements, essential for renewable energy and technology.
4. **Environmental concerns:** Ecosystem damage, pollution, sediment plumes affecting marine life.

**Climate Litigation Overview**

1. **Definition:** Legal action to hold countries and companies accountable for climate efforts and contributions.
2. **Rising trend:** 2,180 cases in 65 jurisdictions by December 2022 (up from 884 in 2017).
3. **Key Cases:**
  - a. **2,000 Swiss women** sued their government over climate inaction.
  - b. **Young plaintiffs in Montana** won against the state for neglecting climate change.
  - c. **A 9-year-old girl in India** filed a case for greater climate action, later rejected.

## 182. GLOBAL SPECIES ACTION PLAN ONLINE KNOWLEDGE PLATFORM (GSAP SKILLS)

**Context:**

IUCN launched the Global Species Action Plan Online Knowledge Platform, known as **GSAP SKILLS**, at the Fourth meeting of the Subsidiary Body on Implementation, Convention on Biological Diversity.

**About GSAP Skills:**

The **Global Species Action Plan (GSAP) SKILLS** platform brings GSAP content online, enabling **real-time updates of**

**technical tools** and resources. Its purpose is to facilitate **global collaboration and partnerships** by connecting decision-makers, species conservation practitioners, and experts at all levels. The platform’s objectives include providing real-time updates on technical resources and ensuring their accessibility and relevance. It also offers **information on species conservation interventions**, actions, and sub-actions for each **Global Biodiversity Framework** target, along with details on actors and technical tools.

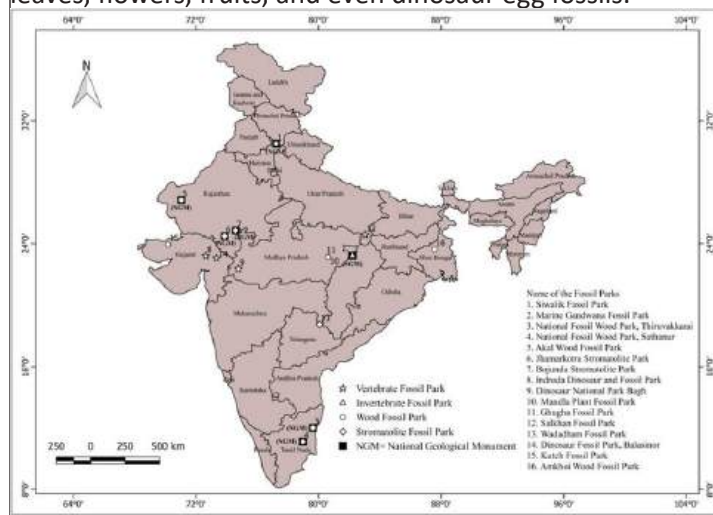
Managed by IUCN, the platform **meets the needs of governments and stakeholders for species conservation actions**. Additionally, it receives support from the Ministry of Environment, the Republic of Korea, and the **Tech4Nature Initiative** launched by IUCN and Huawei in 2020.

## 183. NATIONAL FOSSIL PARK IN GHUGWA, MADHYA PRADESH

**Context:**

Archaeologists from **Ashoka University recently unearthed prehistoric artefacts made from fossil wood** at the **National Fossil Park in Ghugwa, Madhya Pradesh**.

**About Ghughwa National Fossil Park:** Located in the Dindori district, Madhya Pradesh, was established as a National Park in 1983. Situated in a **tropical dry deciduous landscape**, it boasts fossilized plants dating back between **40 million and 150 million** years ago. The park is renowned for its preserved fossils of various woody plants like eucalyptus, date palm, and neem, as well as climbers, leaves, flowers, fruits, and even dinosaur egg fossils.



## 184. EUCALYPTUS TREES

**Context:**

The Kerala government allowed the **Kerala Forest Development Corporation (KFDC) to plant eucalyptus trees** for financial reasons, sparking protests from environmentalists

who argued it would harm forests and increase human-animal conflicts.

- The government later **amended the order to restrict planting eucalyptus only on KFDC land**, aligning with a **2021 eco-restoration policy** aimed at replacing invasive species with indigenous flora.

**Issues with the order:** In conflict with the **2021 Eco-restoration Policy**, which aims to replace invasive species with native ones to support wildlife, the widespread planting of eucalyptus faces opposition. Studies like the **Chinnakanal Example** demonstrate that replacing eucalyptus with native fruit-bearing species could mitigate human-wildlife conflicts. Instances of successful restoration, such as the **Marayoor Sandal Division**, highlight the benefits of removing exotic species, supported by international organizations.

**About Eucalyptus:**

It is native to **Australia, Tasmania, and nearby islands**, and is an **evergreen tree** primarily planted for **fuel and furniture wood**, as well as paper and pulp production. However, concerns arise due to **its high water consumption**, toxicity to animals, and flammable oil emissions. Despite being a biomass production champion, its rapid growth **exacerbates water depletion and soil fertility reduction**, leading to ecological concerns.

### 185. STELLARIA MCCLINTOCKIAE

**Context:**

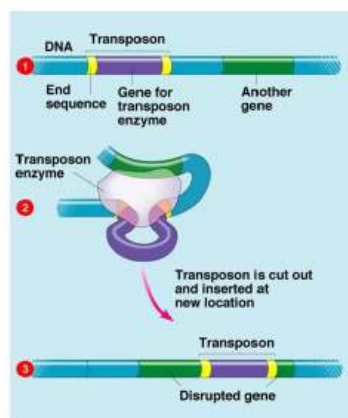
A new plant species, *Stellaria mcclintockiae*, was discovered in **Kerala's Nelliampathy hills** and named after **Nobel laureate Barbara McClintock** (one who discovered Jumping Genes). This is the first *Stellaria* species reported from South India. The annual herb, found at elevations of 1,250-1,400 meters, has unique petals, pollen, bracts, sepals, and seeds.

**About Jumping Genes**

Jumping genes, or transposable elements, are DNA sequences that move within the genome, activating or deactivating nearby genes. They can replicate and insert copies at new locations, causing genetic mutations and contributing to genome evolution.

### Jumping Genes

- In the 1940's, while studying corn, Barbara McClintock discovered that sometimes genes could move from one location to another in a chromosome or even to other chromosomes.
- The movement could result in the genes landing in the middle of another gene and disrupting them.
- These "jumping genes" are now called transposons.



### 186. ALASKA'S RIVERS ARE TURNING ORANGE

**Context:**

Alaska's rivers are **turning orange due to toxic metals** released from thawing permafrost, a study from the University of California, Davis reveals.

As the earth warms, **permafrost melts, exposing minerals like iron, zinc, copper, nickel, and lead, which taint the water**. This phenomenon, visible even from space, has been observed since 2018 and poses concerns for aquatic life and drinking water.

**About Alaska:**

It is a state of the USA, located in the extreme northwest of North America, bounded by the Beaufort Sea, Arctic Ocean, Gulf of Alaska, Pacific Ocean, Bering Sea, and Chukchi Sea. It shares a land boundary with Canada and a maritime boundary with Russia.



**Disaster Management**

### 187. GUIDELINES FOR CONFIRMING HEAT-STROKE AND HEAT-RELATED DEATHS

**Context:**

The Union Health Ministry issued guidelines for confirming heatstroke and heat-related deaths, aiming to help hospitals identify such cases.

**Heatstroke**, a medical emergency, occurs due to **overheating from high temperatures or physical exertion**.

Symptoms include **fatigue, dizziness, nausea, and increased heart rate**.

Criteria for heatstroke include a **body temperature of 40°C or higher**, accompanied by delirium, seizures, or coma. **Over**

**11,000 heatstroke deaths** were recorded in India between 2012 and 2021. The government released a **National Action Plan on Heat-Related Illness** and **the India Cooling Action Plan** to address heat-related health challenges.

The current guidelines by the **National Programme on Climate Change and Human Health (NPCCHH)** and the **National Centre for Disease Control (NCDC)** aim to **help hospitals identify heat-related deaths based on evidence**. Autopsies are not mandatory but can help determine the cause of death.

Defence

## 188. TACTICAL NUCLEAR WEAPONS

**Context:**

Russia has ordered tactical nuclear weapons drills as a warning to Ukraine’s allies amid rising tensions.

**TNWs, or Tactical Nuclear Weapons**, are weapons not classified as **“strategic” under US-Russian arms control agreements**. They include short-range options like land-based missiles (less than 500 km range) and air- or sea-launched weapons (less than 600 km range). TNWs are the least-regulated nuclear weapons category under arms control agreements and are widely present in nuclear arsenals worldwide.

### Two Russian systems able to carry short-range nuclear weapons

**Kalibr missile (SS-N-30)**

Submarine and ship-launched cruise missile system



Target: Land or sea  
 Range: 1,500 - 2,500km  
 Missile length: 6.2m  
 Type: Cruise missile

**Iskander M missile launcher (SS-26 ‘Stone’)**

Mobile ground-based missile system



Target: Land  
 Range: 400 - 500km  
 Missile length: 7.3m  
 Type: Solid-fuel rocket

Source: FAS, CSIS Pictures: Getty Images, Federal Service for Military-Technical Cooperation



## 189. MQ-9B PREDATOR DRONES

**Context:**

The Indian Army and Air Force **plan to deploy MQ-9B Predator drones** at **Sarsawa and Gorakhpur air bases** in Uttar Pradesh to enhance surveillance along the Line of Actual

Control with China.

The US-made drones, with a **flight time of over 36 hours** and capable of reaching heights of 40,000 feet, will bolster India’s surveillance capabilities, particularly in the Indian Ocean Region and along its borders with China and Pakistan. The **MQ-9B has previously been instrumental in monitoring anti-piracy operations** and providing surveillance over long distances.

**MQ-9B, available in two variants - SkyGuardian and SeaGuardian**, serves multiple roles such as surveillance and airborne early warning. Operated by the Indian Navy since 2020, the SkyGuardian is the next generation of remotely piloted aircraft systems (RPAS), capable of flying for over 40 hours in all weather conditions.

## 190. SMART SYSTEM

**Context:**

The DRDO successfully tested the **SMART (Supersonic Missile-Assisted Release of Torpedo) system**, a missile-assisted torpedo release system designed to bolster the Navy’s anti-submarine warfare capabilities.

It can launch **lightweight torpedoes targeting submarines hundreds of kilometres away**, beyond the conventional range.

**About SMART System:**

SMART, developed by DRDO, is a **next-generation missile-based lightweight torpedo delivery system** designed to enhance the Indian **Navy’s anti-submarine warfare capability**. It features a **canister-based design** with advanced subsystems like a **two-stage solid propulsion system** and an electromechanical actuator system. With a parachute-based release system, SMART extends the reach of lightweight torpedoes beyond conventional ranges.

## 191. DEFENCE IN NEWS

Items	Description
<b>Hermes-900</b>	<p>The Indian Army and Navy are set to <b>receive Hermes-900 drones</b>, also known as <b>Drishti-10</b>, to enhance their surveillance capabilities.</p> <p>The Hermes-900 is a <b>next-generation, Medium Altitude Long Endurance (MALE) unmanned aerial system</b>. It boasts over-the-horizon, persistent <b>multi-mission capabilities</b> and has a payload carrying capacity of 350 kgs, making it suitable for various tasks including area dominance, intelligence gathering, and ground support.</p>

<b>Glide Phase Interceptor (GPI) Project</b>	The Glide Phase Interceptor (GPI) Project is a collaborative effort between <b>Japan and the U.S. aimed at developing a hypersonic missile-intercepting system.</b>
	A hypersonic weapon <b>travels at speeds between 5 and 25 times</b> the speed of sound. Below these speeds, weapons are considered subsonic or supersonic. Above these speeds, the atmosphere molecules disassociate into a plasma, complicating control and communication.
	Hypersonic missiles <b>enter the glide phase after separating from boosters at the peak of their trajectory.</b> During this phase, they use gravity to accelerate towards Earth and perform a pitch manoeuvre to enter a flatter trajectory towards their target.

## 192. EXERCISES IN NEWS

Exercises	Description
<b>Exercise SHAKTI</b>	India and France have commenced the <b>7th edition of the India-France Joint Military Exercise SHAKTI</b> in Umroi, Meghalaya.  <b>About Exercise SHAKTI:</b> It is a biennial training event alternating between India and France, with the last edition being held in France in November 2021. Objectives include achieving physical fitness, refining tactical operations, and exchanging best practices.
<b>Exercise 'Tar-kash'</b>	The seventh edition of the <b>Indo-U.S. joint counter-terrorism exercise, 'Tar-kash'</b> , recently took place in Kolkata between India's National Security Guard (NSG) and U.S. Special Operations Forces (SOF).

## 193. BHISHM PORTABLE HOSPITAL CUBES

### Context:

The Indian Air Force conducted a test of **BHISHM portable hospital cubes in Agra**, marking the first such test by the IAF.

**BHISHM cubes are part of "Project BHISHM" aimed at providing a rapid medical response for up to 200 casualties.**

Equipped with innovative tools, including AI and data analytics, the cubes are easily transportable and **deployable within 12 minutes**, suitable for various emergency scenarios. These cubes were strategically deployed during the **Pran Pratishtha ceremony in Ayodhya** earlier this year to enhance medical preparedness and response capabilities.

## 194. F-16 FIGHTER JET PILOTED BY AI

### Context:

In a groundbreaking development at Edwards Air Force Base, an experimental F-16 fighter jet was recently piloted by artificial intelligence (AI) rather than a human.

### What is F-16 Fighting Falcon?

It has been developed by **Lockheed Martin, is a multirole fighter jet** renowned for its agility and versatility. It has been widely used by various air forces around the world since its introduction in the 1970s.

**In India, the equivalent to the F-16 is the HAL Tejas.** Developed by Hindustan Aeronautics Limited (HAL), the Tejas is a **lightweight, multirole fighter aircraft** designed for the Indian Air Force.

### AI adoption in the Indian military:

In 2019, the **Defence AI Project Agency (DAIPA) and the Defence AI Council (DAIC)** were established to oversee AI initiatives. In 2022, the government identified **75 priority projects** aimed at leveraging AI for defense purposes. The Defence Research and Development Organisation (DRDO) has established specialized laboratories, such as the **Centre for Artificial Intelligence and Robotics (CAIR)** in Bengaluru, dedicated to conducting application-oriented research in AI for military applications.

## 195. INDIAN NAVAL SHIPS CONCLUDE SOUTH CHINA SEA DEPLOYMENT

### Context:

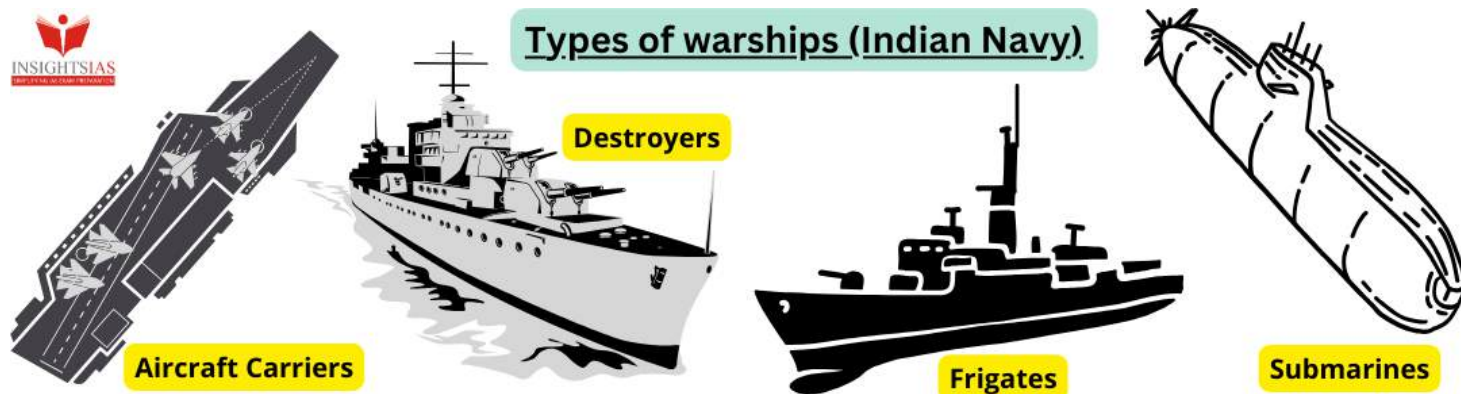
Indian Navy ships **INS Delhi, INS Shakti, and INS Kiltan** completed their operational deployment to the South China Sea, visiting Singapore, Malaysia, Vietnam, the Philippines, and Brunei.

This deployment underscores **India's expanding maritime engagement in Southeast Asia**, focusing on cooperation in the Indo-Pacific. The visit included exchanges, exercises, and community outreach programs aimed at enhancing naval cooperation and interoperability.

### About INS Kiltan:

INS Kiltan, a state-of-the-art indigenous warship, is on the

brink of being commissioned into the Indian Navy. It represents the **third vessel in the Kamorta-class corvettes** constructed under **Project 28**. It is named after an island in the strategically significant Lakshadweep and Minicoy group.



**Types of warships (Indian Navy)**

Type of Warship	Description	Examples
Aircraft Carriers	Large ships capable of carrying and launching aircraft.	INS Vikramaditya, INS Vikrant (under construction)
Destroyers	Versatile warships with anti-air, anti-ship, and anti-submarine capabilities.	INS Kolkata, INS Visakhapatnam, INS Imphal
Frigates	Smaller than destroyers, with multi-role capabilities.	INS Shivalik, INS Nilgiri
Corvettes	Compact warships designed for coastal defense and patrol duties.	INS Kamorta, INS Kiltan
Submarines	Submersible vessels used for stealthy underwater operations.	INS Kalvari, INS Arihant
Patrol Vessels	Smaller craft used for patrolling, search and rescue, and other coastal missions.	INS Saryu, INS Sunayna
Mine Countermeasures Vessels	Designed for mine-clearing operations.	INS Nireekshak, INS Karwar
Landing Platform Docks	Amphibious assault ships for launching troops and equipment ashore.	INS Jalashwa, INS Shardul
Offshore Patrol Vessels	Used for patrolling and surveillance in offshore waters.	INS Vikram, INS Vajra
Research Vessels	Ships dedicated to scientific research and oceanographic studies.	INS Sagardhwani, INS Sindhughosh (research variant)
Training Ships	Used for training purposes and instruction of naval cadets.	INS Tarangini, INS Sudarshini

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**196. RUDRAM-II AIR-TO-SURFACE MISSILE**

**Context:**

Recently, Defence Research & Development Organisation (DRDO) successfully flight-tested the RudraM-II air-to-surface missile from a Su-30 MK-I aircraft of the Indian Air Force off the Odisha coast.

**About RudraM-II**

RudraM-II is an **indigenously developed solid-propelled air-launched missile** designed for air-to-surface operations by the DRDO. Following the successful 2020 test of RudraM, a **new-generation anti-radiation missile (NGARM)** and the first indige-

nous ARM of the Indian Air Force, RudraM-II is equipped with an **Inertial Navigation System (INS)**, Global Positioning System (GPS), and a **Passive Homing Head (PHH)**. The PHH can detect, classify, and engage targets across a wide frequency band.

### Types of Missiles Used by Indian Military

Missile Type	Name(s)	Description
Ballistic Missiles	<a href="#">Agni</a> Series, Prithvi	Long-range missiles capable of delivering nuclear and conventional warheads.
Cruise Missiles	BrahMos, Nirbhay	Subsonic and supersonic missiles for precision strikes, <a href="#">BrahMos</a> being the fastest supersonic cruise missile.
Anti-Tank Missiles	Nag, HELINA, MPAT-GM	Designed to destroy tanks and armoured vehicles.
Surface-to-Air Missiles	Akash, Barak-8	Used for air defence to intercept and destroy enemy aircraft and missiles.
Air-to-Air Missiles	Astra, Python-5	Fired from aircraft to target enemy aircraft.
Anti-Ship Missiles	BrahMos, Dhanush	Used to target and destroy enemy ships and naval vessels.
Anti-Radiation Missiles	RudraM, NGARM	Designed to detect and destroy enemy radar installations.
Surface-to-Surface Missiles	Prahaar, Shaurya	Short to medium-range missiles for targeting enemy installations and strategic points on the ground.
Submarine-launched ballistic Missiles (SLBMs)	K-15 Sagarika, K-4	Launched from submarines for nuclear deterrence.
Man-Portable Air-Defense Systems (MANPADS)	Igla-S, Starstreak	Portable systems for targeting low-flying aircraft and helicopters.

### Report/Study in News

Reports/Study	Description
<a href="#">ICAR - CMFRI study on Coral Bleaching in Lakshadweep Sea</a>	Researchers from <b>ICAR-Central Marine Fisheries Research Institute (CMFRI)</b> have documented <b>widespread coral bleaching</b> in the Lakshadweep Sea due to marine heatwaves since late October 2023.
	Marine heat waves (MHWs) occur <b>when seawater temperatures surpass a seasonal threshold</b> (typically the 90th percentile) for at least 5 consecutive days. These events can persist for weeks, months, or even years.
	<b>The Indian Council of Agricultural Research (ICAR) - Central Marine Fisheries Research Institute (CMFRI)</b> was founded in 1947 and became part of ICAR in 1967. Located in Kochi, Kerala, it is renowned globally for its research in tropical marine fisheries.
	The <b>Laccadive Sea, also known as the Lakshadweep Sea, borders India, the Maldives, and Sri Lanka.</b> Located southwest of Karnataka, west of Kerala, and south of Tamil Nadu, this warm sea sustains a diverse marine ecosystem with approximately 3,600 species in the Gulf of Mannar alone.
<a href="#">India at 19th Interpol Conference of Heads of National Central Bureau</a>	<b>Online radicalization remains a major global security challenge. Internet platforms</b> , especially social media, are utilized by terrorists for radicalization, indoctrination, recruitment, and financing of terror activities.
	<b>Interpol, established in 1923, is an inter-governmental organization facilitating information exchange</b> among national police forces. With 196 member countries, including India, its structure includes a General Assembly, General Secretariat, Executive Committee, and National Central Bureaus (NCB). <b>The NCB serves as the country's focal point</b> for all Interpol activities, with the <b>Central Bureau of India (CBI)</b> designated as India's NCB.

Reports/Study	Description																											
<p><b>2024 <a href="#">World Migration Report</a></b></p>	<p>By <a href="#">International Organization for Migration (IOM)</a></p> <p><b>Conflict and climate change</b> stand as the chief catalysts behind global displacement, resulting in <b>around 281 million international migrants</b> globally, with <b>117 million individuals displaced</b>, marking a historic peak.</p> <p>India, in particular, faces significant impacts, as <b>climate factors notably influence internal migration from regions such as Rajasthan, Uttar Pradesh, and Madhya Pradesh.</b></p> <p><b>India hosts the largest population of international migrants worldwide</b>, totalling 18 million, predominantly in countries like the UAE, USA, and Saudi Arabia.</p> <p>Furthermore, in 2022, <b>India emerged as the foremost recipient of remittances</b>, surpassing the significant milestone of receiving over USD 111 billion, indicative of its substantial role in the global migrant workforce and economy.</p> <p><b>About the IOM:</b> Established in 1951 as part of the UN System, headquartered in <b>Geneva, Switzerland.</b> It comprises 175 member states and aims to address displacement issues and facilitate pathways for regular migration. It leads initiatives like the <b>Global Compact For Migration.</b></p>																											
<p><b>Recipe for a Livable Planet: Achieving Net Zero Emissions in the Agrifood System'</b> report</p>	<p>By <a href="#">World Bank</a></p> <p>Key Findings include: The agrifood system contributes <b>nearly one-third of global greenhouse gas emissions</b>, spanning food production to disposal. Developing countries, notably India, contribute significantly, <b>with 60% of India's emissions stemming from farm activities</b>, especially livestock-related enteric fermentation.</p> <p>The report emphasizes <b>carbon sequestration in agriculture, like reducing enteric fermentation and enhancing fertilizer efficiency</b>, as critical mitigation strategies.</p> <p><b>World Bank (President: Ajay Banga; HQ: Washington DC; est. 1944)</b> is an international financial institution that provides loans and grants to the governments of low- and middle-income countries for the purpose of pursuing capital projects.</p>																											
<p><b>NIT Trichy study on <a href="#">Urban Heat Island</a></b></p>	<p>A study by NIT Trichy reveals a <b>stark contrast in pollutant levels between urban and rural areas</b>, with urban regions experiencing notably higher concentrations.</p> <p><b>Aerosols, carbon monoxide (CO), and ozone (O3) directly contribute to the Urban Heat Island (UHI) phenomenon</b>, where cities can be 5°C to 10°C warmer than nearby rural areas, exacerbating heat waves.</p> <p>The urban heat island effect is <b>when cities are warmer than nearby rural areas due to the concentration of heat-absorbing surfaces</b> like buildings, roads, and other infrastructure. These surfaces absorb and re-emit the sun's heat more than natural landscapes like forests and water bodies</p> <div> <table border="1"> <caption>Late Afternoon Temperature by Zone</caption> <thead> <tr> <th>Zone</th> <th>Temperature (°F)</th> <th>Temperature (°C)</th> </tr> </thead> <tbody> <tr> <td>Rural</td> <td>~85</td> <td>~30</td> </tr> <tr> <td>Suburban Residential</td> <td>~87</td> <td>~31</td> </tr> <tr> <td>Commercial</td> <td>~89</td> <td>~32</td> </tr> <tr> <td>Downtown</td> <td>~92</td> <td>~33</td> </tr> <tr> <td>Urban Residential</td> <td>~90</td> <td>~32</td> </tr> <tr> <td>Park</td> <td>~86</td> <td>~30.5</td> </tr> <tr> <td>Suburban Residential</td> <td>~87</td> <td>~31</td> </tr> <tr> <td>Rural Farmland</td> <td>~85</td> <td>~30</td> </tr> </tbody> </table> </div>	Zone	Temperature (°F)	Temperature (°C)	Rural	~85	~30	Suburban Residential	~87	~31	Commercial	~89	~32	Downtown	~92	~33	Urban Residential	~90	~32	Park	~86	~30.5	Suburban Residential	~87	~31	Rural Farmland	~85	~30
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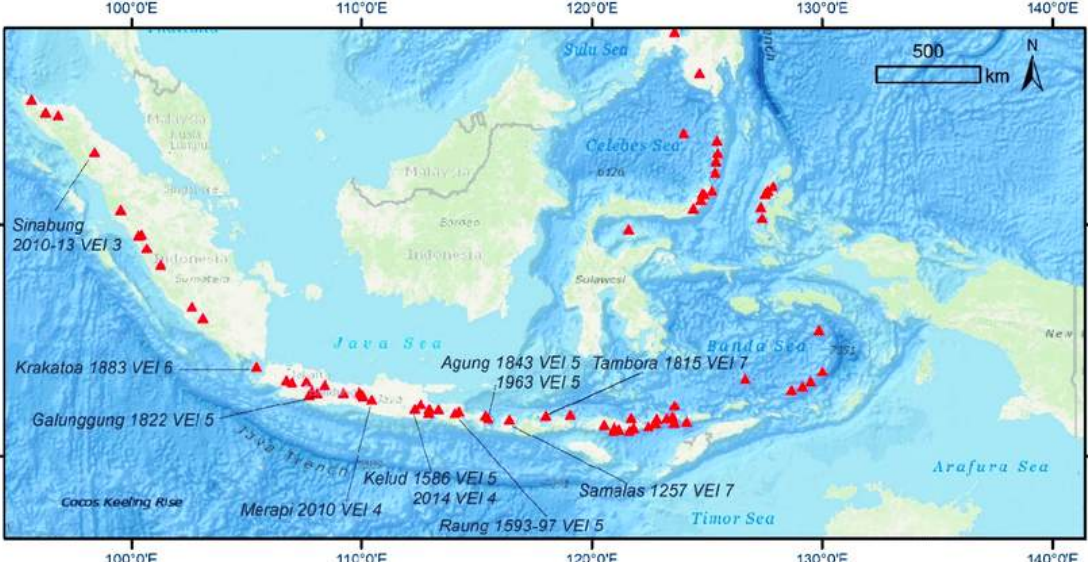
Reports	Description
WHO has released a progress report on <a href="#">Neglected Tropical Diseases (NTDs)</a>	It aims towards the <b>2021–2030 Roadmap</b> for NTDs. The roadmap aims for <b>significant reductions in disease burden, elimination of certain NTDs from multiple countries</b> , and global eradication of dracunculiasis and yaws.
	NTDs are a <b>group of diverse infections caused by parasites, bacteria, viruses, and other pathogens</b> that primarily affect populations in tropical and subtropical regions. These diseases often <b>receive inadequate attention and resources</b> , leading to limited research, diagnosis, and treatment options. Examples of NTDs include <b>malaria, dengue fever, Chagas disease, leishmaniasis, etc</b>
Agritech: Shaping Agriculture in Emerging Economies, Today and Tomorrow	Released by the <a href="#">World Economic Forum (WEF)</a>
	This WEF report is part of its <b>AI for Agriculture Innovation (AI4AI)</b> initiative. This initiative aims to <b>expand agritech services</b> through public-private partnerships.
	In India, initiatives like <b>Agri Stack, Agricultural Data Exchange (ADeX), and Digital Agriculture Mission (DAM)</b> are facilitating the adoption of agritech by providing essential datasets and digital platforms for farmer services.
	The <a href="#">World Economic Forum</a> (WEF) (HQ: Geneva, est. 1971; Founder: German engineer Klaus Schwab) is an international advocacy <b>non-governmental organization and think tank</b>
Amplifying the Global Value of Earth Observation Report	The report released by the <a href="#">World Economic Forum</a>
	Earth Observation (EO) technologies gather data about <b>Earth’s natural and artificial features</b> . EO includes remotely sensed data from satellites and in-situ data from sensors.
	EO could also <b>help reduce over 2 billion tonnes of CO2 annually</b> by 2030 through early warning systems and environmental impact monitoring.
	Global initiatives like <b>MethaneSAT and Allen coral Atlas</b> aim to address these challenges and leverage EO for various purposes.
Beyond Import Reduction: Shaping the Future of <a href="#">India’s Toy Industry</a>	Released by Global Trade Research Initiative (GTRI)
	It proposes a <b>comprehensive strategy to develop India’s toy industry</b> and enhance exports. Measures to promote the local toy industry include <b>increased import duties, quality control regulations, support schemes for toy clusters, and the National Action Plan for Toys (NAPT)</b> .
	Global Trade Research Initiative (GTRI) is a research Group focused on Climate Change, technology and trade. GTRI aims to create high-quality and jargon-free outputs for governments and industry from the perspective of development and poverty reduction
RBI report on the link between Climate change and Monetary Policy Transmission	Climate change poses challenges to <a href="#">monetary policy transmission</a> , according to the <a href="#">Reserve Bank of India</a> (RBI).
	Monetary policy transmission refers to the process through which <b>changes in the central bank’s monetary</b> policy instruments, such as interest rates or reserve requirements, <b>influence the broader economy</b> , including inflation, output, and employment.
	RBI’s report says that climate change directly affects inflation through <b>adverse weather events, impacting agricultural production and global supply chains</b> . Additionally, it can alter the <b>Natural Rate of Interest (NRI)</b> by undermining productivity and potential output due to extreme weather events.
	To address these challenges, adopting a <b>green taxonomy and incorporating climate risk into modeling frameworks</b> are suggested as the way forward.

Reports/Study	Description
<b>Study on Methane concentration</b>	A recent study suggests that <b>methane emissions from fossil fuels have been declining since the 1990s</b> and have remained stable since, <b>while methane produced by microbes</b> has been on the rise. This finding challenges previous assumptions that fossil fuel is the main source of methane in the atmosphere.
	According to recent estimates, the <b>atmospheric concentration of methane today is three times</b> what it was 300 years ago.
	Methane (CH <sub>4</sub> ) accounts for <b>15–35% of the rise in human-induced greenhouse gas emissions</b> . Between 2020 and 2024, methane emissions rose from <b>15 to around 21 parts per billion</b> (ppb).
	Methane is the <b>second most abundant human-caused greenhouse gas after CO<sub>2</sub></b> but has a stronger warming effect. Its global warming potential over a century is <b>28 times</b> that of CO <sub>2</sub> , and even higher over shorter periods.
<b>ISRO releases Indian Space Situational Assessment Report (ISSAR) for 2023</b>	ISSAR 2023, compiled by <b>ISRO’s System for Safe and Sustainable Space Operations Management (IS4OM)</b> , shows a rise in space object population.
	Concerns include an increasing trend in <b>Collision Avoidance Manoeuvres (CAMs)</b> and risks to spacecraft operations and astronauts’ lives <b>due to space debris</b> , potentially leading to the <b>Kessler syndrome</b>
	<b>IS4OM</b> , operational since 2022, safeguards ISRO’s space assets
	India has taken <b>proactive steps to mitigate risks</b> associated with space operations and safeguard its space assets e.g., <b>Object Proximity Analysis (SOPA)</b> for Satellites; <b>Collision Avoidance Analysis (COLA)</b> (conducted for launch vehicles to ensure safe trajectories); ISRO’s Network for space object Tracking and Analysis ( <b>NETRA</b> ) project (enhances space surveillance capabilities); Inter-Agency Debris Coordination Committee ( <b>IADC</b> ) (India collaborating with 13 space agencies to manage space debris collectively)
<b>‘Standards for a Net Zero Iron and Steel sector in India’</b>	Released by the International Energy Agency
	The policy brief emphasizes standards for low and near-zero emissions steel (including the promotion of Green Steel), covering measurement methodologies and defining emissions thresholds.
	India ranks as the <b>world’s second-largest steel-producing country, contributing 7%</b> of total crude steel production India’s steel industry presently <b>represents 12% of carbon dioxide emissions</b> , a figure projected to double by 2030, fueled by government infrastructure initiatives.
	Initiatives to standardize the steel sector in India include the <b>Steel Scrap Recycling Policy of 2019</b> , the Perform, Achieve, and Trade (PAT) scheme under the National Mission for Enhanced Energy Efficiency, and the establishment of 14 Task Forces by the Ministry of Steel to support the development of a <b>“Roadmap for Green Steel.”</b> Globally, initiatives such as the <b>Steel Breakthrough</b> launched during COP26 in 2021 and the <b>Steel Standard Principles</b> introduced at COP28 in 2023 focus on defining and establishing measurement methodologies for low and near-zero emissions steel.
	The International Energy Agency is a <b>Paris-based autonomous intergovernmental organisation</b> , established in 1974, that provides policy recommendations, analysis and data on the global energy sector. The 31 member countries and 13 association countries ( <b>including India</b> ) of the IEA represent 75% of global energy demand.
	India, which joined the <b>IEA Family as an Association country</b> in 2017, sent a formal request for full membership to IEA ministers in October 2023.

<p><a href="#">ISRO Study on Water Ice on the Moon</a></p>	<p>ISRO study reveals <b>evidence for enhanced possibility of water ice</b> in polar craters of the Moon. The presence of ice is crucial for future lunar missions, including sustaining life and generating rocket fuel. The study confirms the <b>hypothesis of sub-surface water ice</b> due to volcanic activity during the <b>Imbrian period (approx. 3850–3800 million years ago)</b>.</p> <p><b>India's contributions:</b> <a href="#">Chandrayaan-1</a> detected signs of hydrated minerals in sunlit areas of the Moon in 2009. Moon Mineralogy Mapper (M3) onboard <a href="#">Chandrayaan-1</a> identified water ice in permanently shadowed regions in 2018.</p>
<p><b>Reports</b></p>	<p><b>Description</b></p>
<p><a href="#">Travel &amp; Tourism Development Index (TTDI) 2024</a></p>	<p>The <a href="#">World Economic Forum (WEF)</a> released the <b>TTDI 2024</b></p> <p>TTDI assesses <b>factors and policies for sustainable and resilient Travel and Tourism</b> development. This second edition evolved from the Travel &amp; Tourism Competitiveness Index (TTCI), WEF's flagship index since 2007.</p> <p>India's rank improved to <b>39 in 2024</b> from 54 in 2021</p>
<p><b>Global Land Outlook Thematic Report on Rangelands and Pastoralists</b></p>	<p>Released by the <a href="#">UN Convention to Combat Desertification (UNCCD)</a></p> <p>The report examines the <b>relationship between rangelands and their human communities</b>, particularly pastoralists, to identify protection strategies.</p> <p><b>Rangelands</b>, comprising ecosystems like grasslands, savannahs, and deserts, cover over 54% of the Earth's surface, with 78% in drylands.</p> <p><b>Up to 50% of rangelands</b> are degraded due to factors like land use changes, excessive grazing, and urban expansion.</p> <p>In India, <b>rangelands cover about 121 million hectares</b>, with 100 million hectares underutilized.</p> <p>The <a href="#">United Nations Convention to Combat Desertification (UNCCD)</a>, <b>adopted in 1994</b>, is the <b>sole legally binding international agreement</b> linking environment and development to sustainable land management. India has ratified it.</p>
<p><a href="#">ILO's Financing gap for universal social protection</a></p>	<p>The report estimates the <b>financing gap to achieve Universal Social Protection (USP)</b> in 133 Low and Middle-Income Countries (LMICs)</p> <p>India needs over US\$135 billion for USP, with a financing gap of <b>3.3% of GDP</b> and <b>11.8%</b> of government expenditure.</p>
<p><a href="#">World Bank's Water For Shared Prosperity</a></p>	<p>The World Bank report, <b>released at the 10th World Water Forum in Bali, Indonesia</b>, defines shared prosperity as boosting prosperity for the poorest to achieve equitable societies.</p> <p><b>Four building blocks of prosperity:</b> Health and Education, Jobs and Income, Peace and Social Cohesion, and Environment.</p> <p>Population growth, urbanization, and climate change increase global water access disparity.</p> <p>In 2022, 197 million people in the world lacked safe drinking water, and 211 million lacked basic sanitation.</p> <p><b>World Water Forum:</b> Held every three years, co-hosted by the World Water Council and a host country. <b>Aims to raise water issues</b> on the political agenda and support international water issue resolutions.</p>

**MAPPING**

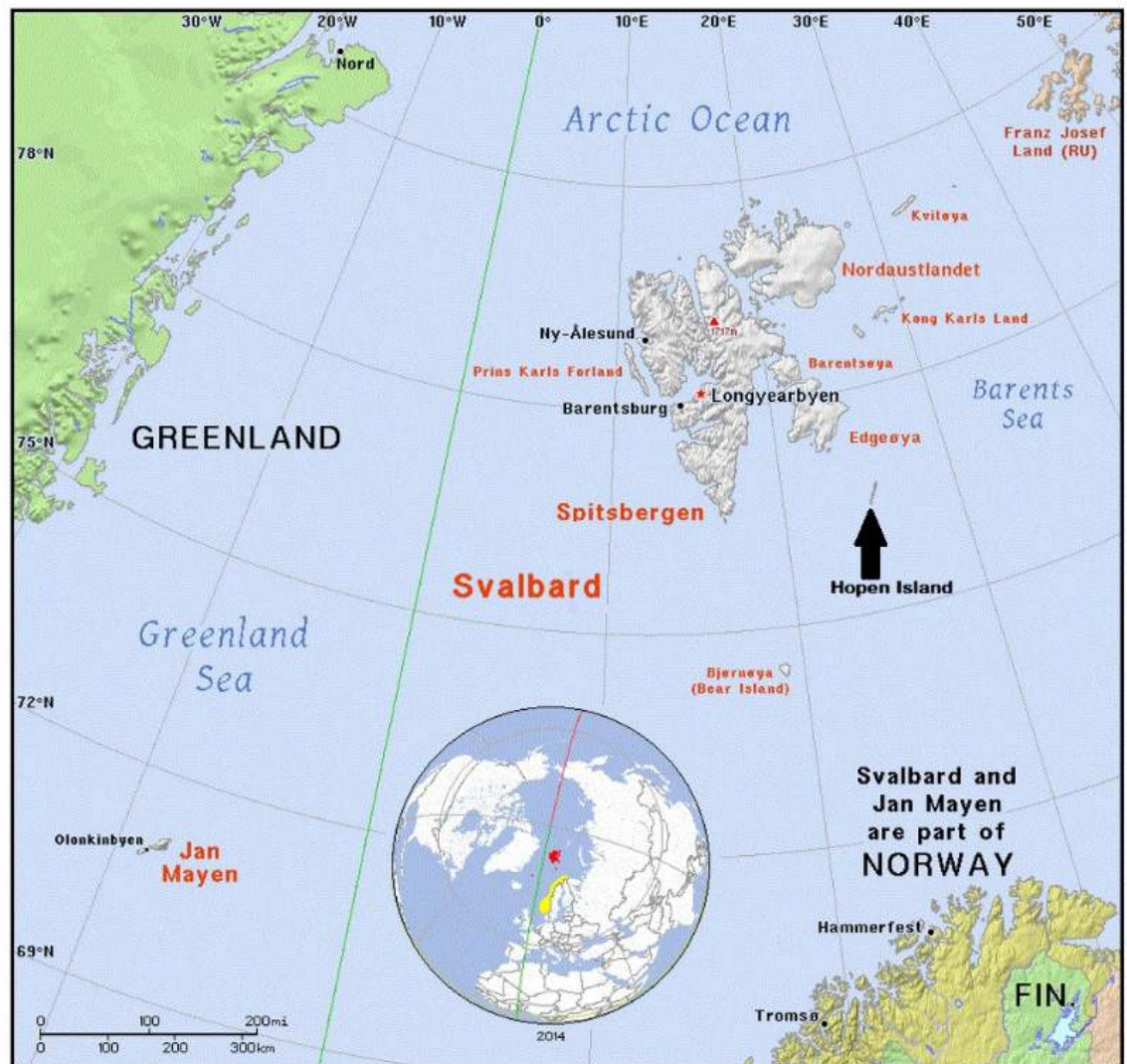
INTERNATIONAL

PLACES	DESCRIPTION
<p><b>1. MOUNT RUANG (INDONESIA)</b></p>	<p><b>Context:</b> <u>Indonesia's Mount Ruang volcano</u> recently erupted, triggering the highest level of alert.</p> <p><u>Indonesia is home to many volcanoes</u> due to its location <u>along the Pacific Ring of Fire</u>, where several tectonic plates meet and interact. This convergence creates <u>intense geological activity</u>, including the subduction of oceanic plates beneath continental plates, which leads to volcanic eruptions. Indonesia has approximately 130 active volcanoes.</p> <p>Mount Ruang is a <u>stratovolcano</u> situated in Indonesia's Sulawesi Islands. Other notable volcanoes in Indonesia include <u>Krakatau, Merapi, and Semeru</u>.</p> 

## 2. HOPEN ISLAND (SVALBARD ARCHIPELAGO)

**Context:** The first case of **a walrus dying from bird flu** was recorded on **Hopen Island** in the Svalbard archipelago. However, it's unclear whether it was the **H5N1 or H5N8 strain**, and there's a possibility that other walruses found also had bird flu.

Hopen, an island in the **Svalbard archipelago (Norway)**, was discovered in 1596 during Willem Barentsz's expedition. Since 1947, the **Norwegian Meteorological Institute** has operated a staffed weather station on the island with a crew of four. Hopen is home to a **significant number of polar bears in winter**. Additionally, Hopen is recognized as an **Important Bird Area by BirdLife International**



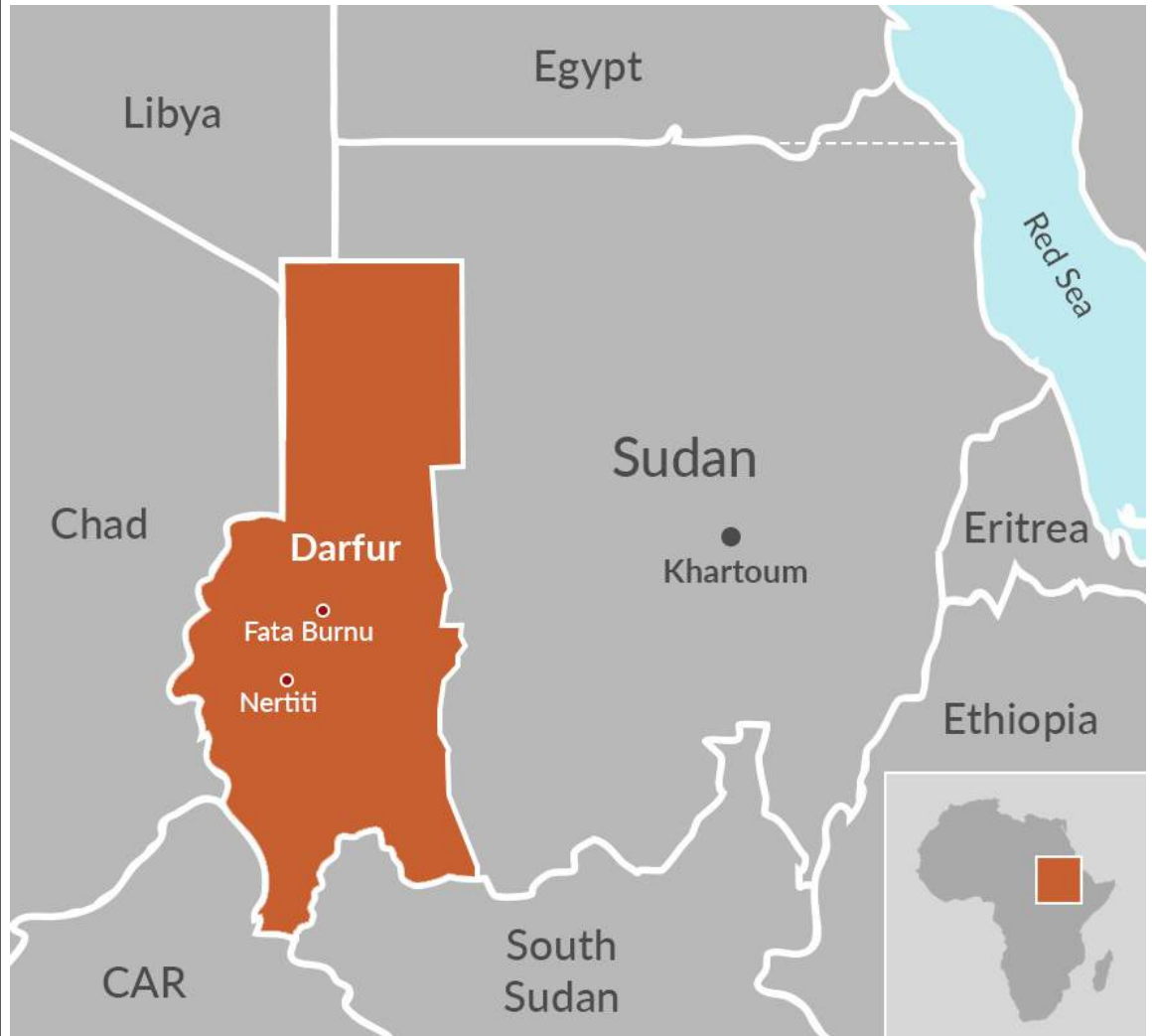
### 3. DARFUR (SUDAN)

**Context:** The UN warns of **imminent starvation in Darfur, Sudan**, as escalating violence worsens the country's hunger crisis.

Civil war since April 2023 has led to a devastating humanitarian situation, with **people resorting to eating "grass and peanut shells" to survive**, according to the World Food Programme.

**About the Darfur region:**

It is a region in **western Sudan that has been plagued by violent conflict and humanitarian crises**. The area has experienced **ethnic tensions between Arab and African communities**, leading to widespread violence and human rights abuses.



**Sudan** is a country in **Northeast Africa**. It borders the **Central African Republic** to the southwest, Chad to the west, Egypt to the north, Eritrea to the northeast, Ethiopia to the southeast, Libya to the northwest, South Sudan to the south, and the Red Sea. It was the **largest country by area in Africa** and the **Arab League until** the secession of South Sudan in 2011.

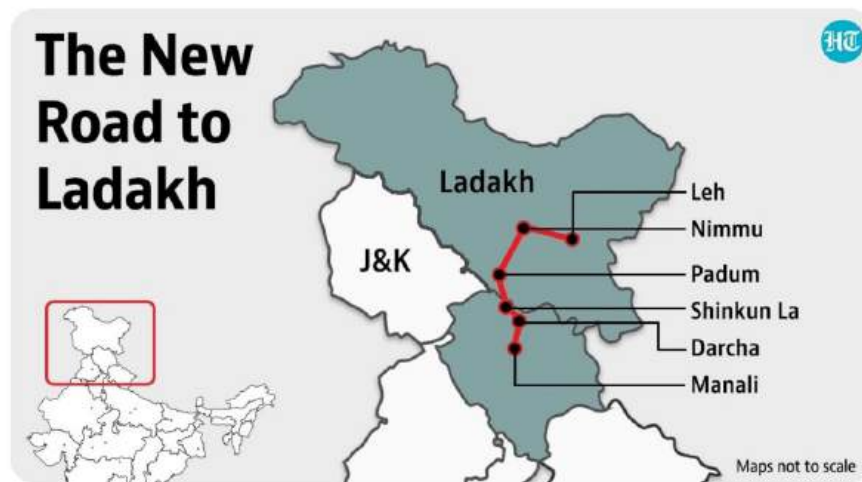
#### 4. SHINKU LA TUNNEL

**Context:** The Border Roads Organisation (BRO) is set to begin work on the **Shinku La** tunnel, which will be the **world's highest**, facilitating all-weather connectivity from Manali to Leh.

The Shinku La tunnel, constructed by the Border Roads Organisation (BRO), will be the **world's highest tunnel** at 15,800 ft, surpassing **China's Mila tunnel**. Spanning **4.1 km** along the Nimmu-Padam-Darcha route, it will provide all-weather connectivity from Manali to Leh, cutting the distance by 60 km.

This tunnel is significant as it offers an **alternative route to Ladakh, streamlining transportation to strategic areas like Kargil, Siachen, and the Line of Control**.

**Established in 1960, BRO develops and maintains road networks** in border areas, playing a crucial role in enhancing connectivity and security.



#### 5. COOK ISLANDS

The **Cook Islands in association with New Zealand**, is spearheading deep-sea mining exploration for minerals crucial in electric car batteries.

The Cook Islands, a self-governing island state, is situated in the **South Pacific Ocean, with its capital at Avarua on Rarotonga Island**. The Northern islands are low-lying coral atolls, while the Southern islands are larger and volcanic.



## 6. INDIAN OCEAN

**Context:** A recent study by the **Indian Institute of Tropical Meteorology (IITM)** predicts a significant warming of the Indian Ocean, leading to a **tenfold increase in marine heatwaves**, from an average of **20 days per year to 220–250 days per year**. The **Arabian Sea** experiences maximum warming.

**Consequences:**

This warming trend, largely **attributed to global warming**, is expected to have severe consequences, including **coral bleaching, seagrass destruction**, and loss of **kelp forests**, adversely impacting **the fisheries sector**. The study also highlights a substantial increase in the ocean’s heat content, which contributes to sea-level rise and affects the **Indian Ocean Dipole (IOD)**, potentially altering monsoon patterns.

**About the Indian Ocean:**

**The Indian Ocean is the third-largest ocean in the world**, covering an area of over 70 million square kilometers. It is bounded by Africa to the west, Asia to the north, Australia to the east, and the Southern Ocean to the south. The ocean is known for its **warm waters and diverse marine life**, including coral reefs, whales, dolphins, and various species of fish.



**Oceans on Earth are (larger to smaller):** the Pacific Ocean, Atlantic Ocean, Indian Ocean, Southern Ocean, Arctic Ocean

## 7. INDONESIA

**Context:** India and Indonesia celebrate 75 years of diplomatic ties, forged by the Treaty of Friendship in 1951.

Both nations were part of the **Bandung Conference in 1955**, leading to the Non-Aligned Movement. They established a **Strategic Partnership in 2005**, later elevating it to a **Comprehensive Strategic Partnership**. Indonesia is a key partner in **India's Act East Policy**. Trade-wise, Indonesia is **India's largest ASEAN trade partner** and a significant source of crude palm oil. Joint military exercises like **Samudra Shakti and IND-INDO CORPAT** enhance security cooperation.

Indonesia is the **world's largest archipelagic state located in Southeast Asia and Oceania**, spanning over 17,000 islands including **Sumatra, Java, Sulawesi, and parts of Borneo and New Guinea**. With a land area of 1,904,569 square kilometres and a population of over 279 million, it's the **14th-largest country** by area and the **fourth-most populous globally**, with Java being the most populous island.



**8. VENEZUELA**

**Context:** Venezuela may **become the first nation to lose all its glaciers** as climate scientists reclassify its last glacier, the **Humboldt**, as an ice field due to its diminutive size.

The glacier has drastically shrunk over the years, with one study indicating it reduced to less than 10 hectares by 2015-2016.

**About Venezuela:**

It is a country on the **northern coast of South America**. To the northwest are the **Andes Mountains and the colonial town of Mérida**, a base for visiting Sierra Nevada National Park. Caracas, the capital, is to the north.

The country's economy is strongly dependent **on hydrocarbons, as well as on loans from China and Russia**. Traditionally, petroleum represents more than 85% of Venezuela's exports.



**New Caledonia**

**New Caledonia** is a **French overseas territory in the South West Pacific Ocean**. Its maritime neighbours include Australia, Fiji, New Zealand, Papua New Guinea, and Vanuatu. Though it is one of the **European Union's Overseas Countries and Territories (OCTs)**, New Caledonia is **not part of the EU, Euro, or Schengen zones**. The Lagoons of New Caledonia and associated coral reef ecosystem are a **UNESCO World Heritage site**.

**A state of emergency** has been declared by France in New Caledonia, including curfews and bans on gatherings and alcohol sales.



**Nile River**

The **Nile River**, the **longest river in the world** ( though this has been contested by research suggesting that the **Amazon River is slightly longer**), flows from south to north through Eastern Africa. Originating from **rivers that feed Lake Victoria**, it travels northward through northeastern Africa before draining into the Mediterranean Sea. The Nile runs through or along the borders of 11 African countries, including Egypt, Burundi, Tanzania, Rwanda, the Democratic Republic of the Congo, Kenya, Uganda, Sudan, Ethiopia, Eritrea, and South Sudan. Its major tributaries are the White Nile, Blue Nile, and Atbara.



Satellite imagery, geophysical surveys, and sediment cores revealed that the pyramids of Egypt were built near a **now-buried 64km branch of the Nile River, named Ahramat**, which facilitated the transport of massive stone blocks and materials.

**Port of Call (Spain's Cartagena)**

**What is a Port of Call?:** A port of call is a **designated stop where a ship docks during its journey**. It serves as a temporary destination where passengers and cargo can embark or disembark, and where the ship can refuel, take on supplies, or undergo maintenance if necessary.

Cartagena is a **port city and naval base** in the Murcia region of southeast Spain.



Spain has refused permission for an **Israel-bound ship carrying arms to call at the southeastern port of Cartagena**. The Marianne Danica, carrying nearly 27 tons of explosive material from India's Madras

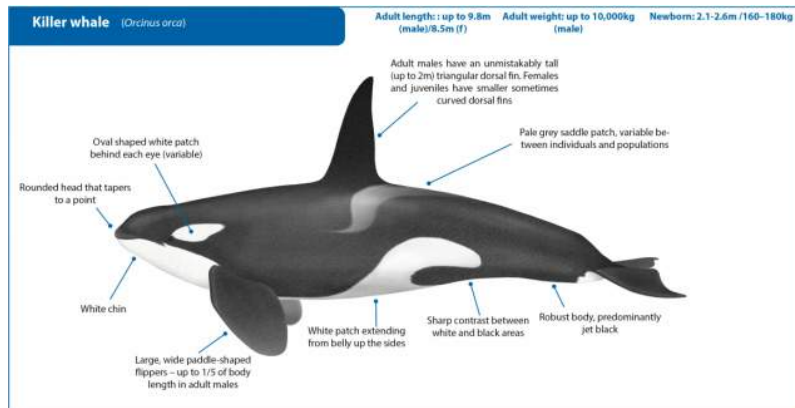
## 9. STRAIT OF GIBRALTAR

**Context:** A sailing yacht sank in Moroccan waters near the Strait of Gibraltar after being rammed by orcas.

**About Orcas, also known as killer whales:**

They are the **largest dolphins, recognized by their black-and-white colouring**, reaching up to 8 meters in length and weighing up to 6 tonnes. Highly intelligent and social, they use **echolocation for communication and hunting**.

While powerful predators, they are **not aggressive towards humans in the wild**. Pods, or maternally related groups, have distinct communication patterns. Orcas are listed as **Data Deficient on the IUCN Red List and under CITES Appendix II**.



**About the Strait of Gibraltar:**

It is a **vital shipping route connecting the Mediterranean Sea to the Atlantic Ocean** and has been the site of recent orca attacks on vessels. It acts as a natural chokepoint between Europe and Africa.



Rotterdam, Netherlands

**World Hydrogen Summit 2024** held in Rotterdam, Netherlands

The summit featured **India's Ministry of New & Renewable Energy** showcasing advancements in green hydrogen technology at its pavilion.

**India's initiatives:** [National Green Hydrogen Mission \(NGHM\)](#) in 2023; [Strategic Interventions for Green Hydrogen Transition Programme \(SIGHT\)](#); [Hydrogen Valley Innovation Clusters](#)

Hydrogen, a colourless, odourless, tasteless, and flammable gas, is the most abundant element in the universe and the third most abundant on Earth's surface, resembling alkali metals and halogens.

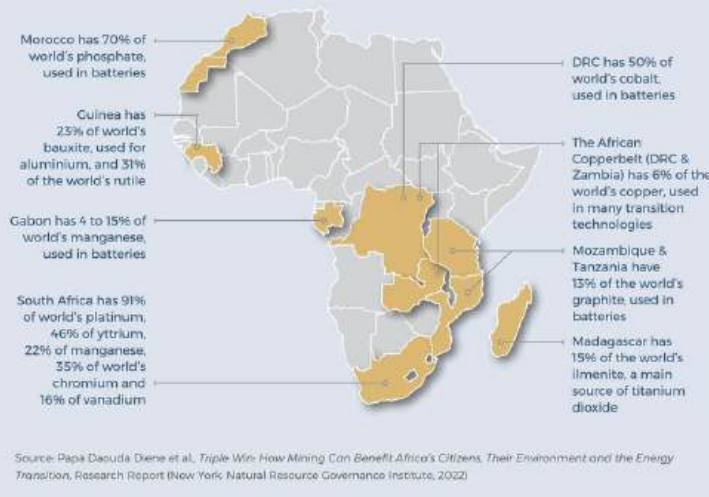


### 10. AFRICA: CRITICAL MINERAL ACQUISITION PLAN BY INDIA

**Context:** India aims to **bolster its access to critical minerals in Africa** to enhance resource security and challenge China's dominance in the region.

- With a list of 30 crucial minerals, including lithium and cobalt, India seeks partnerships in countries like Tanzania, Zimbabwe, Congo, and Zambia.

Figure 1 African countries with large shares of critical minerals



**Khanij Bidesh India Limited (KABIL)** was established in 2019 as a joint venture of **NALCO, HCL, and MECL** to secure strategic minerals like lithium and cobalt from overseas. **KABIL** handles the identification, acquisition, exploration, and processing of these minerals to meet India's commercial needs.

**The Mineral Security Partnership (MSP)** is a US-led coalition of 14 countries, including **India**, focusing on ensuring stable supply chains for critical minerals like **Cobalt, Nickel, Lithium, and rare earth minerals**. Its mandate includes diversifying and stabilizing global supply chains, promoting investment, upholding environmental and social standards, and increasing mineral recycling.

## 11. INDONESIA'S MOUNT IBU

**Context:** Indonesia's Mount Ibu on Halmahera island erupted, sending ash 4 km high with purple lightning flashing around its crater.

### About Mount Ibu

Mount Ibu is a stratovolcano on the northwest coast of Halmahera Island, Indonesia. It stands 1,377 meters above sea level and spans 16 km east-west and 13 km north-south. Known for frequent eruptions, it recorded 21,100 eruptions in 2023, making it the second most active volcano in Indonesia.

### About Stratovolcanoes

Stratovolcanoes are tall, steep, cone-shaped volcanoes found mainly above subduction zones, forming major parts of regions like the Pacific Ring of Fire. They differ from the flatter shield volcanoes and makeup about 60% of the Earth's volcanoes.



## 12. CAMPI FLEGREI (ITALY)

**Context:** Recently, a 4.4 magnitude earthquake struck Italy's Campi Flegrei supervolcano region, causing mild damage in Pozzuoli and Naples. This quake, part of a recent "seismic storm," occurred at a depth of three kilometres.

### What is Campi Flegrei?

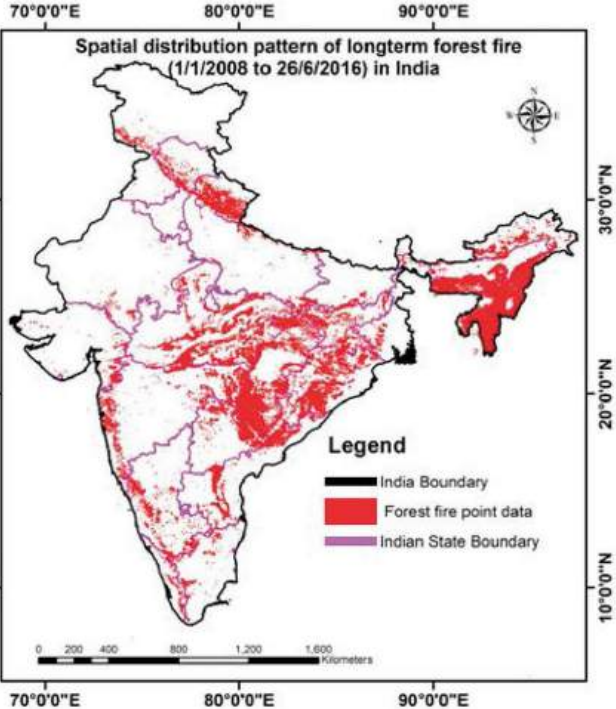
Campi Flegrei (Phlegrean Fields) is an active volcanic area near Naples, Italy, known for its complex volcanic system rather than a single volcano. The region's caldera, formed 39,000 years ago, spans 12-15 km in diameter, with one-third under the Tyrrhenian Sea. It is the largest active caldera in Europe and more active than nearby Mount Vesuvius. Campi Flegrei has been restless since 1950 due to bradyseism, a phenomenon involving surface movement from underground magma chamber activity. Its last eruption in 1538 created Monte Nuovo.

### About Italy:

Italy, a European country with a long Mediterranean coastline, has its capital, Rome, and is home to the Vatican as well as landmark art and ancient ruins.

Italy has many volcanoes because it is located on a tectonic plate boundary where the African Plate is subducting beneath the Eurasian Plate. This geological activity creates conditions favourable for volcanic activity, leading to the formation of several active and dormant volcanoes.



PLACES	DESCRIPTION
	<p><b>Context:</b> Large <a href="#">Forest fires</a> are raging with forest fires across Uttarakhand. <b>Nearly a hundred hectares of forest have been destroyed</b>, exacerbated by dry conditions from the prevailing heatwave.</p> <p>In some regions of Uttarakhand, <b>fires were doused with the help of a Bambi bucket</b>, a special-ised aerial fire-fighting tool used to pour water in targeted areas.</p> <p><b>Uttarakhand</b> faces frequent forest fires due to adverse climate conditions like heatwaves and dry spells, exacerbated by the presence of <b>dry pine needles</b> and human activities like burning forests for fresh grass and carelessly discarding cigarette butts.</p> <p><b>More than 36% of India's forest</b> cover is estimated to be prone to frequent forest fires. To address forest fires, initiatives like the <a href="#">National Action Plan on Forest Fires 2018</a>, <a href="#">State of Forest Report 2021</a> and the <a href="#">Forest Survey of India's Van Agni Geo-portal</a> have been implemented. The <a href="#">Wildlife (Protection) Act, 1972</a>, prohibits setting fire in wildlife sanctuaries. Preventive measures include the <b>construction of watch towers</b> for early detection, the involvement of local communities, and the <b>creation and maintenance of fire lines</b>.</p>
<p><b>1. FOREST FIRE IN UTTARAKHAND</b></p>	 <p><b>Spatial distribution pattern of long-term forest fire (1/1/2008 to 26/6/2016) in India</b></p> <p>The map shows a high concentration of forest fire point data (red dots) in the central and eastern parts of India, particularly in the states of Madhya Pradesh, Chhattisgarh, Jharkhand, and Odisha. There are also scattered points in the northern and western regions. The map includes a legend with three items: a black line for 'India Boundary', a red square for 'Forest fire point data', and a purple line for 'Indian State Boundary'. A scale bar at the bottom indicates distances from 0 to 1,600 kilometers. The map is framed by a coordinate grid with longitudes from 70°0'0"E to 90°0'0"E and latitudes from 10°0'0"N to 30°0'0"N.</p>

## 2. SONAI RUPAI WILDLIFE SANCTUARY

Located in the **foothills of the Himalayas in Assam's Sonitpur district**, it is part of the **Sonitpur Kameng Elephant Reserve** along with **Nameri National Park**. Recognized as an **Important Bird Area by Birdlife International**, it boasts diverse fauna including Asian Elephants, Indian Bison, Leopards, and various deer species, and rich flora with different types of forests. The sanctuary is intersected by perennial rivers like **Dolsiri, Gabharu, Gelgeli, Belsiri, and Sonairupai**.

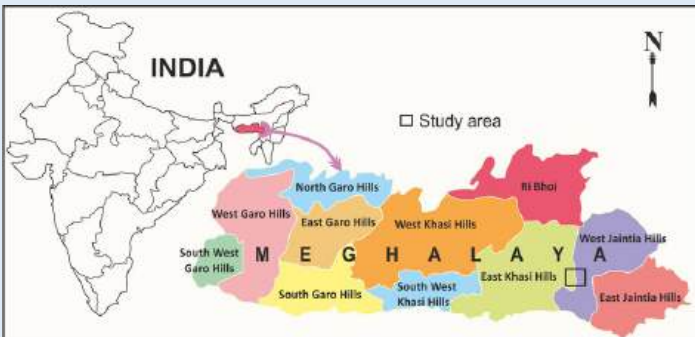


The National Green Tribunal has taken note of **construction activities in Sonai Rupai Wildlife Sanctuary**.

## 3. MEGHALAYA'S EAST JAINTIA HILLS

**Rat-hole mining** involves **narrow pits dug into the ground**, primarily practised in Meghalaya due to the **thinness of coal seams**.

East Jaintia Hills district is a district with its **headquarters at Khliehriat in Meghalaya** state. The district was carved out of Jaintia Hills district on 31 July 2012. Khliehriat and Saipung are the two community and rural development blocks of the district.



Despite a **ban imposed by the National Green Tribunal in 2014**, all 26,000 abandoned rat-hole coal mines in Meghalaya's East Jaintia Hills district remain operational.

#### 4. ARAVALLI REGION

This directive, based on a report by the Central Empowered Committee (CEC), includes hills and a 100-meter-wide buffer zone around them.

The Aravalli Range, among the world's oldest fold mountains, is home to diverse flora and fauna, with significant rivers originating from its slopes. However, it faces major threats such as illegal mining, deforestation, and undermining of the Natural Conservation Zone (NCZ) designation, particularly by Haryana.



NCZ is a protected area designation in Haryana. The 2021 Regional Plan passed by the NCR Planning Board zoned the entire Aravalli range in Delhi, Haryana, and Rajasthan as NCZ

The Supreme Court has prohibited four states—Delhi, Rajasthan, Haryana, and Gujarat—from granting fresh mining leases in the Aravalli region.

## 5. LIPULEKH, LIMPIYADHURA, AND KALAPANI (NEPAL)

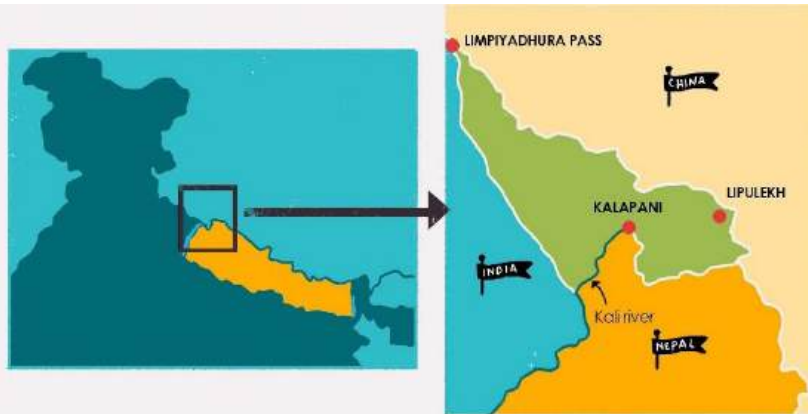
**Context:** Nepal plans to introduce **a new Rs 100 currency note** featuring disputed territories with India, including **Lipulekh, Limpiyadhura, and Kalapani**.

- Previously, in 2020, **Nepal** passed **its second Constitution Amendment Bill** which provided legal status to its claims over these territories

India has objected to this move, considering it an **“artificial enlargement” of territorial claims**.

**About the territories:**

**Kalapani is the largest territorial dispute between Nepal and India**, situated at a tri-junction with Tibet (China). The disagreement stems from the **origin of River Kali, demarcated in the Treaty of Sagauli (1816)**. Nepal claims the river west of Kalapani as the main River Kali, **originating at Limpiyadhura or Lipulekh pass**, while India argues it originates from a rivulet named **Pankhagad**, defining the border differently.



## 6. SHAKSGAM VALLEY OF PAKISTAN-OCCUPIED KASHMIR

**Context:** India protests Chinese road construction in the **Shaksgam Valley of Pakistan-occupied Kashmir**, claiming it as part of its territory and raising **concerns over territorial integrity**. India has **never accepted the 1963 China-Pakistan Boundary Agreement** and protests against any attempts to alter the situation.

Shaksgam Valley (also called Trans-Karakoram Tract) is an area of **about 5,200 km<sup>2</sup> north of the Karakoram watershed**, administered by China, but claimed by India. While under **Pakistan's control since 1947, Pakistan recognized Chinese sovereignty over it in the 1963 Sino-Pakistan Agreement**. India disputes this claim, asserting it is part of the Kashmir region. The Shaksgam Valley is strategically important due to its **proximity to the Siachen glacier**, a critical area amidst India-China tensions.



## 7. SUNDARBANS MANGROVE ECOSYSTEM

**Context:** Air pollution from Kolkata and the Indo-Gangetic Plain threatens the Sundarbans mangrove ecosystem, revealed a recent study.

Pollutants, including **black carbon and heavy metals, degrade air quality**, harming mangroves. Antiquated boat motors are a major source of toxic metals. The acidic components of pollutants lead to **oxidative stress**, endangering mangrove cells.

### **What is oxidative stress?**

Oxidative stress refers to the **condition where pollutants, such as heavy metals and acidic components** in the air, lead to **excess production of reactive oxygenated species (ROS)** in the mangrove ecosystem. This overproduction of ROS can overwhelm the natural antioxidant defences of the mangrove cells, leading to **cellular damage and threatening the overall health and resilience** of the ecosystem.

### **About Sundarbans:**

**Sundarbans** is a mangrove area in the delta formed by the confluence of the Ganges, Brahmaputra and Meghna Rivers in the Bay of Bengal.

### **Features:**

1. Sundarban in India is its **largest mangrove ecosystem**.
2. **Sundarban Reserve Forest** of Bangladesh is the largest mangrove forest in the world.
3. It contains **Sundarbans Tiger Reserve, Sundarban Wetland, Sundarbans National Park and Biosphere Reserve**.
4. It is the **only mangrove forest in the world inhabited by tigers**



## 8. KAZIRANGA NATIONAL PARK

**Context:** Kaziranga National Park in Assam has **achieved a significant milestone by recording its highest revenue in its 50-year history during the 2023-24 tourism** year. The park also witnessed a surge in visitors, with a total of 3,27,493 tourists, including 13,919 foreign visitors.

### About **Kaziranga National Park:**

1. **Located in the State of Assam** and is the single largest undisturbed and representative area in the **Brahmaputra Valley floodplain**.
2. **International Status:**
  - a. It was declared a UNESCO World Heritage Site in 1985.
  - b. It is recognized as an Important Bird Area by BirdLife International.

### Important Species Found:

1. **KNP is home to the world's most one-horned rhinos.** Pobitora Wildlife Sanctuary has the **highest density of one-horned rhinos** in the world and the second-highest number of Rhinos in Assam after Kaziranga National Park.
2. Much of the focus of conservation efforts in Kaziranga is focused on the **'big four' species— Rhino, Elephant, Royal Bengal tiger and Asiatic water buffalo.**
3. **Rivers and Highways:** The park has the Diphlu River running through it.



## 9. EAGLENEST WILDLIFE SANCTUARY

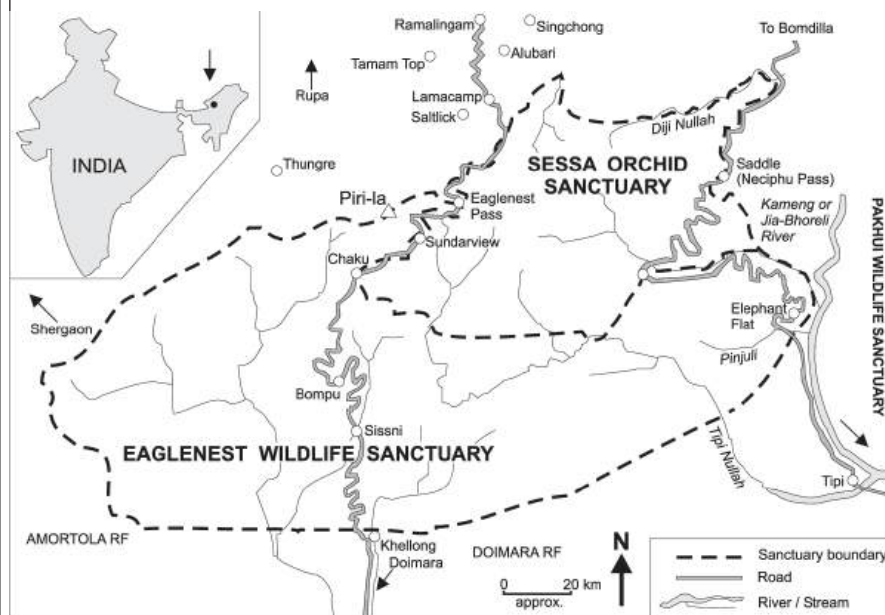
**Context:** A Red panda, an **endangered species**, was recently captured on camera in the Eagle-nest Wildlife Sanctuary (EWS) in Arunachal Pradesh.

### Key Points about Red Pandas:

1. **Two panda species:** Giant Pandas and Red Pandas.
2. **State animal** of Sikkim.
3. **Shy, solitary, arboreal;** indicator species for ecological change.
4. **Two (sub) species in India:** Himalayan and Chinese red pandas.
5. Found in **India, Nepal, Bhutan, Myanmar, and China.**
6. Declining numbers; protected under IUCN, CITES, and Wildlife Protection Act.
7. Release program by **Padmaja Naidu Himalayan Zoological Park:** Pandas released in Singalila National Park, West Bengal.

### About Eaglenest Wildlife Sanctuary:

Located in the **Himalayan foothills of West Kameng District, Arunachal Pradesh**, Eaglenest Wildlife Sanctuary is a protected area known for its rich biodiversity. It borders **Sessa Orchid Sanctuary** to the northeast and **Pakhui Tiger Reserve** to the east, spanning an altitude range from 500 to 3,250 meters. Home to over 500 bird species, it is part of the **Kameng Elephant Reserve**. The sanctuary is renowned for birding, with diverse flora including temperate cloud forests, bamboo patches, and rhododendrons. Its fauna includes species like the **capped langur, Bengal tiger, Asian elephant, red panda, and Asiatic black bear**. The sanctuary's name is derived from the **Red Eagle Division** of the Indian army, stationed there in the 1950s



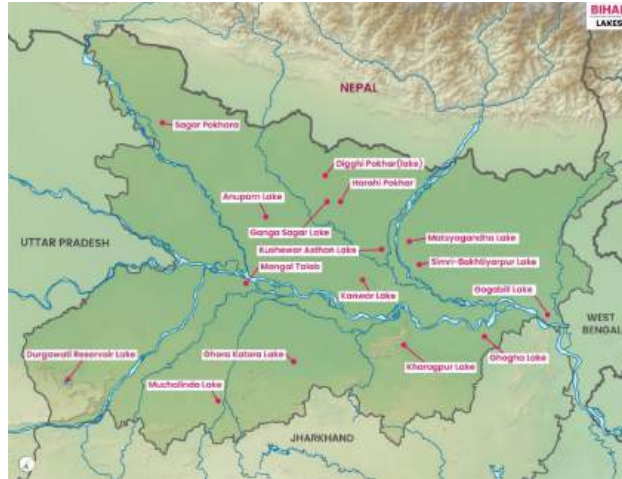
**Figure 1.** Location of Eaglenest Wildlife Sanctuary and Sessa Orchid Sanctuary, Arunachal Pradesh, India

## 10. KANWAR LAKE (BIHAR)

**Context:** Kanwar Lake in Begusarai, Bihar, is in critical condition due to encroachment and drying, severely impacting bird habitats.

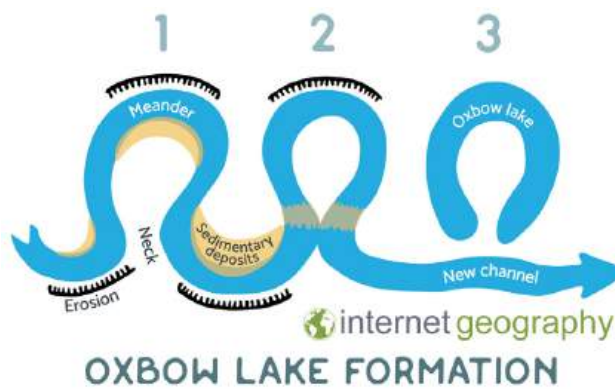
### About the lake:

Kanwar Lake (also known locally as Kabartal) is **Asia's largest freshwater oxbow lake**, formed by the **meandering Burhi Gandak River**, a tributary of the Ganga. This rainfed lake fills up during the monsoon. Recognized as a wetland of international importance under the **Ramsar Convention** (the only one from Bihar), it was declared a protected area in 1986 and later designated as a sanctuary to prevent bird poaching.



### What are Oxbow Lakes?

Oxbow lakes are **U-shaped, formed when a river bend becomes isolated after the river changes course**. Typically found in flat plains near a river's mouth, they are Stillwater lakes with no inflow or outflow.

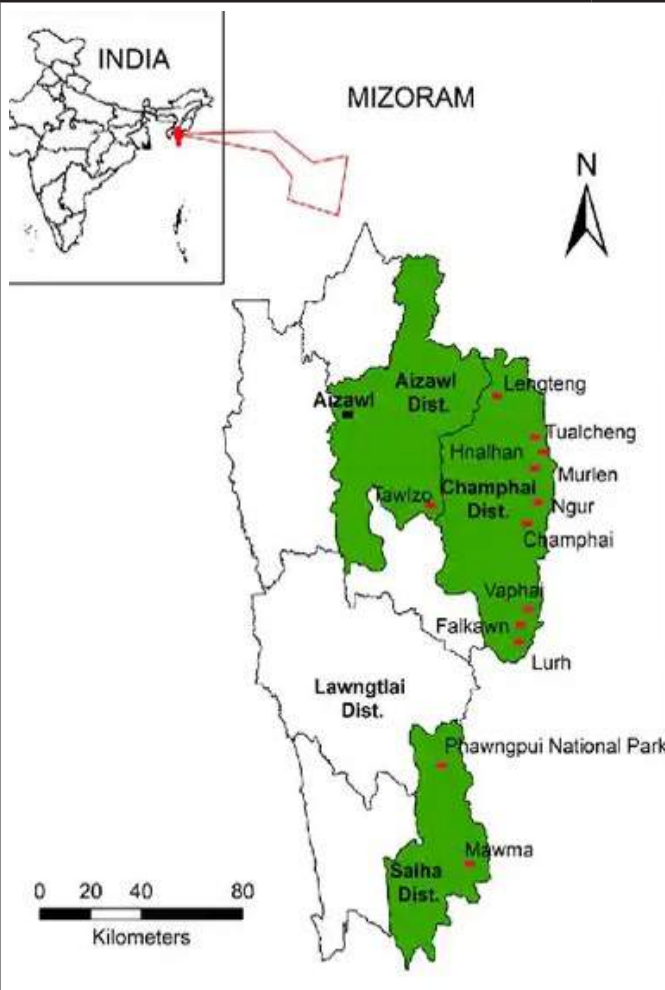


### 11. PHAWNG- PUI NATION- AL PARK OF MIZORAM

A rare **hemi-parasitic terrestrial plant (Phtheiospermum lushaiorum)** has been found in Phawngpui National Park of Mizoram. Lushaiorum is named after "**Lushai**" tribe of Mizoram.

**Phawngpui National Park, also known as Phawngpui Blue Mountain National Park,** is one of two national parks in Mizoram, India, the other being the larger **Murlen National Park.** Located about 300 km from Aizawl in the Lawngtlai district near Burma, it encompasses Phawngpui, Mizoram's highest peak at 2,157 meters, along with the surrounding reserve forest.

The **Lushai tribe, part of the Kuki-Chin group,** is commonly known as Mizos and is of Mongoloid origin. Their main occupations are Jhum and orange cultivation, and they are historically known as a headhunter community. The **popular Bamboo Dance (Cheraw-dance)** is a cultural highlight. Lushai society is organized as a patrilocal joint family with patrilineal descent and inheritance rules.




**12. KOUNDINYA WILDLIFE SANCTUARY (ANDHRA PRADESH)**

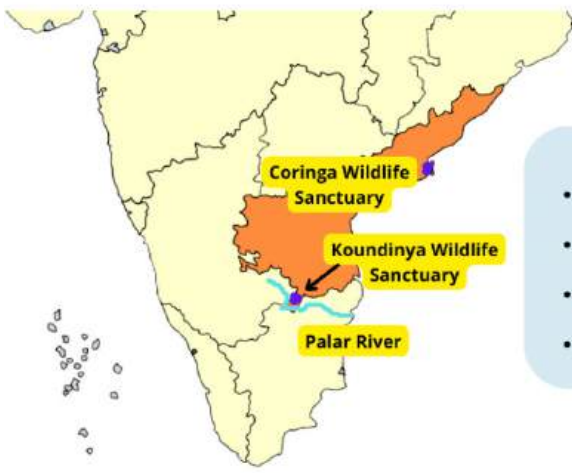
The **Sri Lankan golden-backed frog** has been rediscovered in India after 200 years at Koundinya Wildlife Sanctuary.

Located in the **Kuppam and Palmaner Ranges of Chittoor district, Andhra Pradesh**, it is the only sanctuary in the state known for **Asian elephants**. The Koundinya and Kaigal tributaries of the **Palar River flow through it**.

**Koundinya Wildlife Sanctuary**



Koundinya Wildlife Sanctuary is a wildlife sanctuary and an **elephant reserve** situated in Andhra Pradesh, India. It is the **only sanctuary** in Andhra Pradesh with a population of Asian elephants



- It is also an **Elephant Reserve** located in Chittoor district of Andhra Pradesh.
- Has **dry deciduous forests** with thorny scrubs
- **Kaundinya and Kaigal**, tributaries of Palar River pass through the sanctuary.
- **Kalyan Revu Water falls**

**13. UJANI DAM**

**Context:** Six people, including two children, drowned after their boat capsized in the Ujani dam backwaters in Maharashtra's Pune district due to **strong winds and rains**.

**About Ujani Dam:**

Ujani Dam is on the **Bhima River near Ujjani village** in Solapur district, Maharashtra. The dam generates 12 MW of hydroelectric power.

**About Bhima River:**

It is also known as the **Chandrabagha River, it is a major tributary of the Krishna River**. Originates in the **Bhimashankar hills** near Karjat, Pune District, Maharashtra. Flows southeast through Maharashtra, Karnataka, and Telangana, merging into the Krishna River at Kadlur, Karnataka. **Pandharpur**, an important pilgrimage centre, is situated on its right bank.



## 14. KU-MAON HIMALAYAS

**Context:** The Supreme Court has temporarily halted a **90-acre hotel and township project** in the Kumaon Himalayas, challenging the **“single window” clearance system**. SC argued that **single-window clearances** cannot replace **mandatory environmental approvals** in such ecologically sensitive areas.

### Kumaon Himalayas:

1. **Location:** West-central Himalayas in northern India, within Uttarakhand, northwest of Nepal.
2. **Boundaries:** Between the Sutlej River (west) and Kali River (east).
3. **Ranges:** Part of the Siwalik Range (south) and Great Himalayas (north).
4. **Highest Peaks:** Nanda Devi and Kamet.
5. **Lakes:** Naini Lake, Sattal, Bhimtal, Naukuchiya Tal.
6. **Hill Stations:** Nainital, Ranikhet, Almora.
7. **Indigenous People:** Tharus, Bhutiyas, Jaunsaris, Buksas, Rajis.
8. **Concerns:** Ecologically fragile and seismic-prone area.

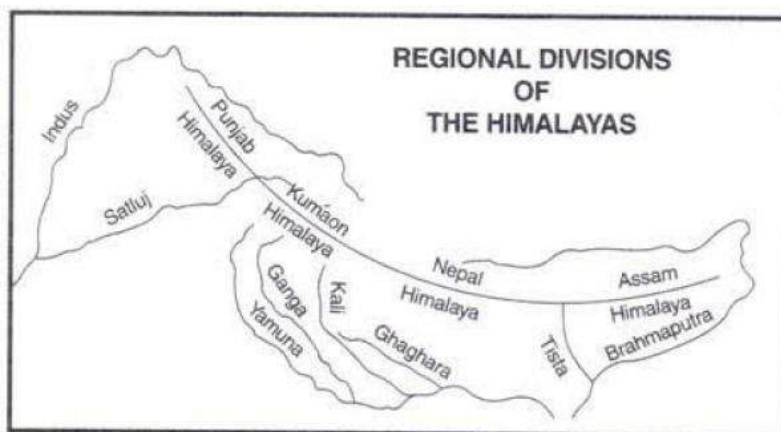


FIG. 3.7. Regional Divisions of the Himalayas

### Shiwalik Range:

1. **Extent:** 1,600 km from the Teesta River (Sikkim) through Nepal and India to northern Pakistan.
2. **Parallel:** Runs with the Himalayan system from Haridwar (Ganges) to the Beas River.
3. **Height:** Average 900 to 1,200 meters.
4. **Composition:** Low sandstone and conglomerate hills.



**15. NA-MERI TIGER RESERVE**

**Context:** The Himalayan serow was recently spotted for the first time in the central region of Nameri National Park and Tiger Reserve.

**About Himalayan Serow**

1. **Species:** Subspecies of the mainland serow (*Capricornis sumatraensis*)
2. **Appearance:** Resembles a mix of goat, donkey, cow, and pig
3. **Habitat:** Found at altitudes of 2,000-4,000 meters in the eastern, central, and western Himalayas
4. **Characteristics:** Medium-sized, large head, thick neck, short limbs, long ears, dark coat
5. **Diet:** Herbivorous
6. **Distribution:** Restricted to the Himalayan region in Asia
7. **Conservation Status:** Vulnerable (IUCN), CITES Appendix I, Wildlife Protection Act, 1972: Schedule I

**About Nameri Tiger Reserve**

Nameri Tiger Reserve, located in the northern Sonitpur district of Assam near the foothills of Arunachal Pradesh, shares its northern boundary with Pakke Tiger Reserve, creating a continuous habitat. The reserve comprises Nameri National Park, Sonai-Rupai Wildlife Sanctuary, and the Naduar and Balipara Reserve Forests, and is defined by the Jia-Bhoreli River to the west and the Bor-Dikorai River to the east. The vegetation includes tropical evergreen and semi-evergreen forests, moist deciduous forests, cane breaks, and grasslands. The reserve’s diverse fauna features the rare white-winged wood duck, leopard cat, common otter, black giant squirrel, and several other species.

