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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 introduces 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 provisions.
4. Both are critical for strengthening India's democratic setup.
5. Both serve as guiding principles for the judiciary in determining constitutionality.
6. 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)

- (a) Directive Principles of State Policy
- (b) Fundamental Rights
- (c) Preamble
- (d) 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)

1. Preamble
2. Directive Principles of State Policy
3. Fundamental Duties

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: (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)

1. They shall be enforceable by courts.
2. 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)

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

2. 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
Budget Passage Without Discussion	In 2023, around 40% of the over Rs 18 lakh crore budget across 10 states was passed without discussion. Madhya Pradesh passed 85% of its over Rs 3 lakh crore budget without discussion. Kerala, Jharkhand, and West Bengal followed with 78%, 75%, and 74% respectively
Poor functioning of the Public Accounts Committee (PAC)	In 2023, PAC held 24 sittings on average and tabled 16 reports. In five states, including Bihar and Delhi, PAC didn't table any reports. Maharashtra's PAC neither convened nor released any report throughout the year
Hurried Legislative Action	44% of bills in all the states in 2023, were passed on the same or the next day of introduction. Gujarat, Jharkhand, Mizoram, Puducherry, and Punjab passed all bills on the same day. - Kerala and Meghalaya took longer than five days to pass over 90% of their bills.
Ordinances Route	Uttar Pradesh issued 20 ordinances, followed by Andhra Pradesh (11) and Maharashtra (9)
Poor Evaluation of Law-Making	Only 23 out of over 500 bills were referred to legislative committees for deeper examination.

Assent by Governor	While the Constitution requires the Governor to give assent to Bills at the earliest, only 59% of the Bills received assent within a month of being passed. Delays were seen in states like Assam, Nagaland and West Bengal.
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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: Government policies and interventions for development in various sectors and issues arising out of their design and implementation.

3. 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
Inequitable Access to Health Insurance	Lowest health insurance coverage among households under the underprivileged sections.
	NFHS-5 results show only about 36% coverage among lowest lowest-wealth households.
Poor Finance	India's current health expenditure (both Government + Private) stands at approximately 3.2% of its GDP , significantly lower than the average of over 5% observed among Lower- and Middle-Income Countries (LMIC).
Inclusion and Exclusion Errors	Government Schemes are prone to inclusion and exclusion errors, potentially including ineligible households and excluding eligible ones.
Inadequate Availability of Services	56% of PMJAY empanelled hospitals in the public sector, and 40% in the private for-profit sector, indicating unequal service availability

Inadequate structure	Infra-	Lack of proper infrastructure, including health facilities, equipment, and medical supplies, hinders UHC
		The shortfall of over 79% specialists at Community Health Centers compared to the requirement.
		Lower bed density: (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.
Poor Health Educa-	tion	Lack of education and awareness about healthy lifestyles and preventive measures contributes to preventable illnesses and conditions.

Way forward:

- Investing in Rural Healthcare Infrastructure:** Build affordable hospitals, and clinics, and provide incentives for healthcare professionals.
- Monitoring and Regulation:** Ensure efficient fund utilization and prevent leakages through robust monitoring systems and stricter regulations.
- Preventative Healthcare:** Promote healthy lifestyles, early disease detection, and regular checkups to reduce future healthcare costs.
- Infrastructure and Human Resource Improvement:** Invest in new healthcare facilities, and medical research, and expand medical education.
- Accessibility of Quality Healthcare:** Implement targeted programs for marginalized communities, enforce regulations, and ensure transparency.
- Improving Mental Health Services:** Increase funding, train healthcare workers, and reduce social stigma around mental illness.
- Addressing Health Inequities:** Collaborate with other sectors to address social determinants of health and reduce health inequities.
- Sustainable Health Governance:** Strengthen management systems, regulatory bodies, and cybersecurity measures for critical medical infrastructure.
- Tax Reductions:** Incentivize R&D with tax deductions and reduce GST on life-saving drugs.
- 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)

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

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

4. 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
Economic Growth	India has experienced robust economic growth over the past two decades , positioning itself as one of the fastest-growing major economies globally.
Military Capabilities	India has significantly enhanced its military capabilities through modernization efforts, procurement of advanced weapons systems, and strengthening of defence infrastructure.
Geopolitical Significance	India's inclusion in key global institutions like the G-20, invitation to G-7 meetings , and active participation in multilateral groups like the Quad , BRICS , and the Shanghai Cooperation Organisation highlight its growing geopolitical significance.
Indo-Pacific Focus	Growing international attention on the Indo-Pacific region underscores India's importance as a global player, given its central position geographically and strategically.
Peer Accommodation	Despite challenges, there is notable peer accommodation of India's claims to be a globally significant power , 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.
Global Strategic Stability	India's role in the Indo-Pacific is considered pivotal to global strategic stability , with increasing recognition from major powers and regional stakeholders alike.
Soft Power	India's rich cultural heritage , diverse traditions, young demography and soft power assets such as Bollywood, yoga, and cuisine contribute significantly to its global influence and attractiveness.

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:

1. **Priority to neighbouring countries:** Emphasis on strong ties with immediate neighbours.
2. **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.

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 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)

GENERAL STUDIES – 3

Topics: Infrastructure: Energy, Ports, Roads, Airports, Railways etc.

1. 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
Aviation Boom	India is the world's third-largest domestic aviation market after the USA and China.
Infrastructure Development	The airport network has doubled from 74 in 2014 to 148 in April 2023 , enhancing accessibility.
Regional Connectivity Scheme-UDAN	517 RCS routes connecting 76 airports have facilitated air travel for over 1.30 crore people, promoting accessibility.
Passenger Growth	Post-Covid resurgence: Domestic airlines saw over 29% increase, and international airlines over 39% increase in passengers from Jan to Sep 2023 compared to 2022.
Carbon Neutrality	MoCA initiatives aim for carbon neutrality and net zero emissions at airports, with several airports already achieving carbon neutrality and operating on green energy .
Future Projections	India expects to handle over 140 million passengers in FY2024 and over 1.3 billion 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 businessman 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 Vistara 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 disproportionately 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 ef-

ports, air connectivity remains constrained across remote regions in **North East, and Central India** with several operational challenges.

- a. E.g. Just 16% of all routes operational under the UDAN scheme are reportedly profitable so far
6. **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.
 - a. E.g.: DGCA currently has just **132 flight operation inspectors** against sanctioned strength of 172 technical officers.

Government Initiatives:

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

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)

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](#)

2. 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 enter-**

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 <small>Visit Insights IAS</small>
Implementation Period	10 years	10 years	10 years	10 years	10 years <small>Daily Current Affairs</small>

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.

prises 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 **NotPetya malware campaign**, can be penetrative and lethal.

AI is impacting cybersecurity in several ways:

1. **Increased Phishing Attacks:** Phishing emails surged by 1,265%, and credential theft rose by 967% since late 2022 due to AI.
2. **Voice Cloning for Fraud:** Hackers imitated a mother's daughter's voice to extort money, highlighting the risks of AI-based scams.
3. **Enhanced Hacking Sophistication:** AI helps hackers translate code, identify vulnerabilities, and amplify attacks.
4. **Rising Attacks on Organizations:** 75% of professionals 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 Malware attack on the City Union Bank’s SWIFT system in March 2020 led to unauthorised transactions worth USD 2 million.
Cyber warfare	Consists of attacks on the computer systems of a country or its institutions to disrupt, damage, or destroy infrastructure.
	For the Cyberattack on the Kudankulam Nuclear Power Plant .
Cyber spying	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- Operation Side Copy , a cyber espionage campaign targeted Indian military and diplomatic personnel with malware and phishing emails.
Cyber terrorism	Defined as premeditated, politically motivated attacks against information systems, programs, and data that threaten or result in violence.
Illegal data mining	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)

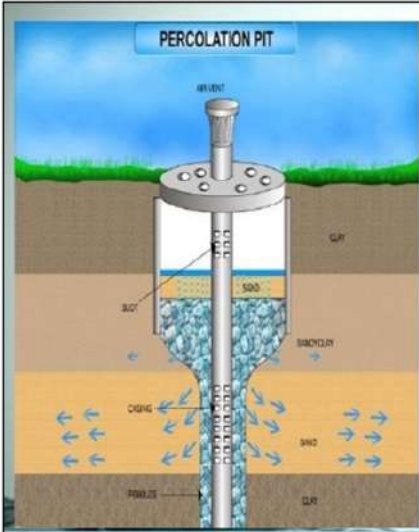
1. Bring down electricity consumption in industrial units
2. Create meaningful short stories and songs
3. Disease diagnosis
4. Text-to-Speech Conversion
5. Wireless transmission of electrical energy

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

CONTENT FOR MAINS ENRICHMENT

CONTEXT	USE IN ANSWER WRITING
<p>1. PERCOLATION WELLS</p>	<p>Context: Percolation wells, a solution to Bengaluru’s water crisis, capture rainwater to restore and recharge groundwater.</p> <p>What are Percolation Wells? Percolation wells are earthen dams, typically 12 feet deep and 4 feet wide, 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 designed to restore and conserve groundwater, offering a sustainable solution to water scarcity in urban areas like Bengaluru.</p> <div style="display: flex; align-items: flex-start;">  <div style="margin-left: 10px;"> <ul style="list-style-type: none"> ▪ To divert rainwater into an aquifer, ▪ The percolation pit is covered with a perforated concrete slab ▪ The pit is filled with gravel/pebbles followed by river sand for better percolation. ▪ The top layer of sand must be cleaned and replaced at least once in two years to remove settled silt for improving the percolation </div> </div> <p>United Way of Bengaluru (a unit of the global United Way network, a privately-funded non-profit organisation founded 132 years ago) aims to build 10,000 wells by 2026, already completing 3,600 with private funding. These wells have revived borewells in Lal Bagh and are now being adopted by local municipalities to combat water scarcity. Scientifically built, they trap rainwater and recharge aquifers, offering a sustainable approach to water management amid urbanization challenges.</p>

2. SOCIAL CONSTRUCTION OF TECHNOLOGY THEORY

What is SCOT Theory?

Social Construction of Technology (SCOT) theory posits that **technological development is influenced by social factors rather than being solely driven by inherent technological capabilities.**

It emphasizes that **technologies are not inherently good or bad but are shaped by the values, interests, and needs of society.** 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.

Usage: The theory can be used in Indian society/Sociology to demonstrate the interaction of Society with evolving technology.

3. VIRTUAL TOUCH

Context: 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

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.

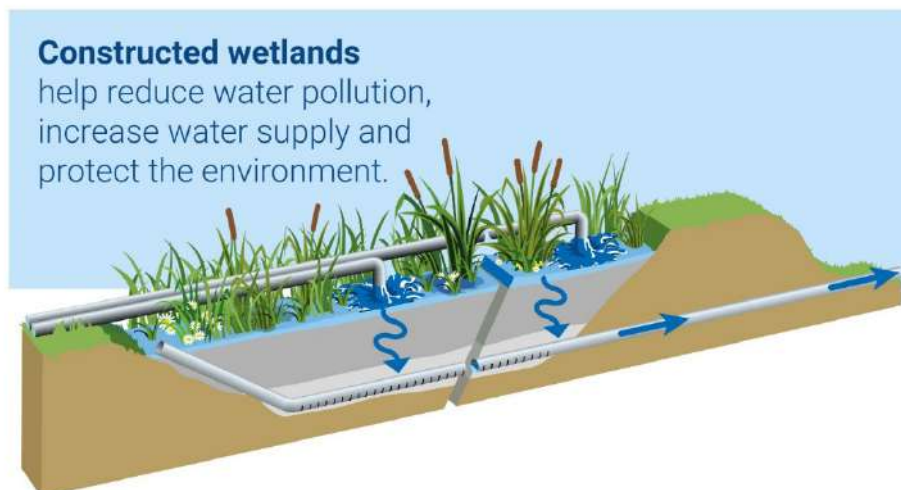
What is ‘Virtual Touch’?

‘Virtual Touch’ refers to the concept of **teaching minors to recognize potential risks in cyberspace, alongside traditional concepts of “good touch” and “bad touch.”** 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.

4. CONSTRUCTED WETLANDS

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.

Constructed wetlands are effective in **treating various types of wastewater, including domestic sewage, industrial effluents, and stormwater runoff.** They are often used as an **alternative to traditional wastewater treatment** methods, offering advantages such as lower operational costs, environmental benefits, and versatility in design and application. Additionally, **constructed wetlands can provide habitat for wildlife,** improve water quality, and contribute to flood control and carbon sequestration.



5. JIM SIMMONS

Context: Jim Simmons passed away recently.

The world believed that **there was only one way to make money in the stock market**, and that was **fundamental analysis (and not technical analysis)**. While many traders in the past achieved solid outperformance without fundamental analysis, **Jim Simmons (an American hedge fund manager, mathematician, and philanthropist)** stood out because he did it with a large hedge fund.

Benjamin Graham (fundamental king) said, “People who invest make money for themselves; people who speculate (referred to as short-term trading using technical analysis) make money for their brokers.”

If Jim had blindly believed that **short-term trading could not make money**, we would not have Jim Simmons in this world.

The lesson is to **always be open and receptive to new ideas and ways of doing things**.

Billionaire investor James Simons was also known as the “**Quant King**” for his pioneering use of computer signals in trading decisions. Simons, founder of **Renaissance Technologies LLC**, transitioned from **mathematics and intelligence work** to becoming a Wall Street legend. His firm, **Renaissance**, achieved extraordinary success with its **Medallion Fund**, known for its high returns and low risk.

FACTS FOR PRELIMS

GS-1

1. 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.

2. 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.

3. 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.

GS-2

1. ADMINISTRATIVE ALLOCATION OF SPECTRUM

Why in the News?	The Supreme Court of India rejected the Centre’s plea for administrative allocation of spectrum , upholding the principle of open and transparent auction for spectrum allocation.
Why Did the Supreme Court Reject the Centre’s Application?	SC emphasized that spectrum allocation to private players should adhere to open and transparent auctions , as established by the landmark 2G spectrum case , to avoid favouritism and ensure fairness and transparency in the distribution of airwaves.
What is the Legal Framework Regarding Spectrum Allocation?	Telecommunications Act, 2023 empowers the government to assign spectrum through administrative processes, excluding auction for entities in its First Schedule , such as those engaged in national security, defence, and law enforcement.
What is Spectrum?	The spectrum comprises radio frequencies 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 auctions for spectrum allocation in 1989 , followed by many countries. The US transitioned to auctions in 1993 after cellular licence lotteries resulted in speculative applicants and losses. Canada and the EU often use an administrative process rather than an auction

2. REPORTS/STUDY IN NEWS

Reports/Study	Details
World Press Freedom Index (WPI) 2024	India ranked 159 out of 180 countries in the annual WPI 2024, released by Reporters Without Borders (RSF) , a Paris-based NGO advocating for freedom of information.
	Published on World Press Freedom Day (May 3) with the theme “ A Press for the Planet: Journalism in the Face of the Environmental Crisis ”. Top 3 ranked countries: Norway, Denmark, and Sweden
	Indicators: Based on five indicators: Political, Economic, Legislative, Social, and Security.

<p>CEEW study: Coal's Share in India's Electricity Capacity</p>	<p>For the first time, coal's share in India's total electricity capacity fell below 50%. A study by CEEW revealed India achieved a total installed capacity of 442 GW in 2024, with over 71% of net power generation capacity added contributed by renewable energy sources, particularly solar energy.</p> <p>Despite declines in share, net coal capacity addition increased four times compared to FY23</p>
<p>ISRO Study on Water Ice on the Moon</p>	<p>ISRO study reveals evidence for enhanced possibility of water ice 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 hypothesis of sub-surface water ice due to volcanic activity during the Imbrian period (approx. 3850–3800 million years ago).</p> <p>India's contributions: Chandrayaan-1 detected signs of hydrated minerals in sunlit areas of the Moon in 2009. Moon Mineralogy Mapper (M3) onboard Chandrayaan-1 identified water ice in permanently shadowed regions in 2018.</p>

3. 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**

4. 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.

5. 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 turnaround time, as per the CAG report.
11. **Whistleblower Policy Non-Adoption:** Several states, including Bihar, Chhattisgarh, and Rajasthan, have not adopted a whistleblower policy.

6. 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.

7. 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:

1. **Article 350A:** Mandates states to provide primary education to linguistic minority groups in their

mother tongue.

2. **Section 29 of the Right to Education Act, 2009:** Advocates for the medium of instruction to be in the mother tongue whenever possible.
3. **NISHTHA FLN:** Promotes teaching in mother tongue, regional language, and home language.
4. **52 Entry-Level Primers:** Developed by NCERT and Indian Institute of Languages for teaching children in various mother tongues and local languages.
5. **International Mother Language Day:** Observed on 21st February, initiated by Bangladesh and recognized by UNESCO in 1999.
6. **Yuelu Proclamation by UNESCO:** Emphasizes the importance of preserving and promoting linguistic diversity.

8. 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.

GS-3

1. 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.

2. 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 CDSCO:

The Central Drugs Standard Control Organisation (CDSCO) 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**. CDSCO 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.

3. 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 **vital 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**.

4. 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 nematicide**. 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
Chemical Weapons Convention (CWC)	Entered into force in 1997. It Prohibits the development, production, stockpiling, and use of chemical weapons. It Monitors the elimination of chemical weapons.
	India is a signatory and party , and it enacted the Chemical Weapons Convention Act, 2000.
Geneva Protocol 1925	Prohibits the use of chemical and biological weapons in conflicts.
Organization for the Prohibition of Chemical Weapons (OPCW)	Headquartered in Hague, Netherlands . It implements the Chemical Weapons Convention. Its mission is to achieve a world free of chemical weapons.
	It has 193 members including India . It was awarded the Nobel Prize for Peace in 2013 for efforts to eliminate chemical weapons.

5. 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.

6. BATILLIPES CHANDRAYAANI

Context:

A **new marine tardigrade species** discovered off the southeast 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**.

7. 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.

8. THIRTHAHALLI ARECANUT

Context:

The Tirthahalli variety of areca has been identified as the best quality among those grown in Karnataka.

About Areca :

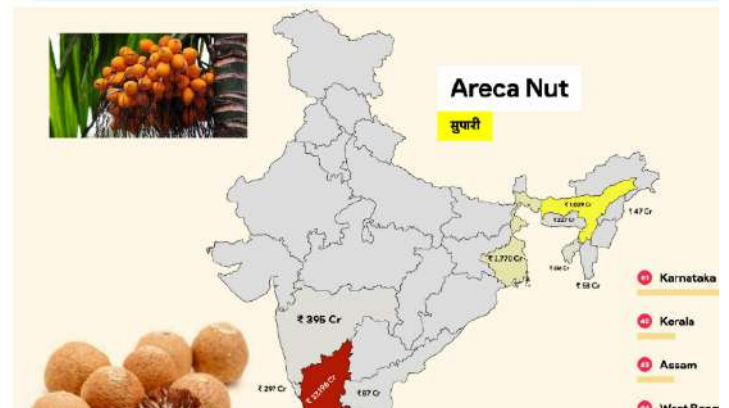
The Areca palm, also known as the yellow palm or butterfly palm, is characterized by clustered slender stems and ascending leaves. **Originating from Madagascar**, it thrives in tropical climates and can also be grown indoors in temperate zones. It's valued as a horticultural and commercial crop domestically 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' (Yellow Leaf Disease, Yellow Leaf Spot, Nut splitting, Inflorescence Button shedding

Blast Disease,' this plant infection is caused by an air-borne fun that attacks the leaves of the arecanut plant.



9. GOLDENE

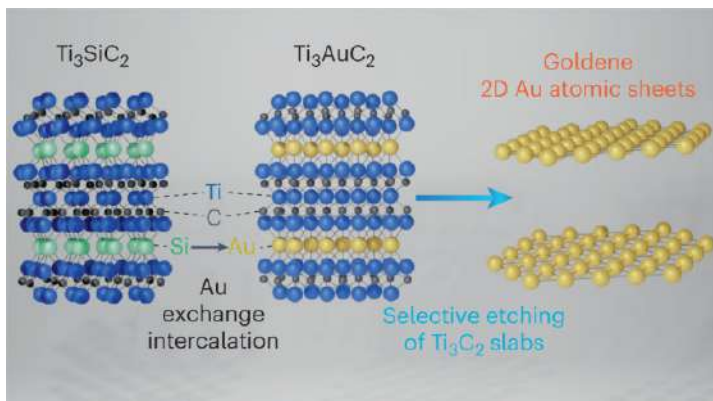
Context:

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 free-standing 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.

10. PEPTIDE

Context:

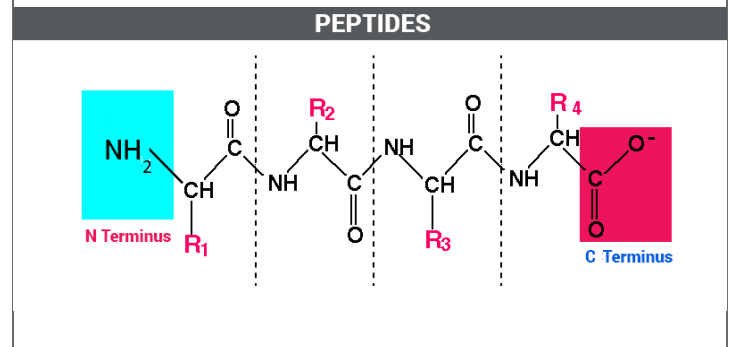
A peptide **derived from cows shows promise in treating deadly drug-resistant bacterial infections**, particularly those caused by **Klebsiella pneumoniae**.

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.



11. 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 **Bandipur**, Nagarahole, **Dandeli-Anshi**, and Biligiriranga Tiger Reserve.

12. 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.



13. REPORT/STUDY IN NEWS

Reports/Study	Description
ICAR-CMERI study on Coral Bleaching in Lakshadweep Sea	Researchers from ICAR-Central Marine Fisheries Research Institute (CMERI) have documented widespread coral bleaching in the Lakshadweep Sea due to marine heatwaves since late October 2023.
	Marine heat waves (MHWs) occur when seawater temperatures surpass a seasonal threshold (typically the 90th percentile) for at least 5 consecutive days. These events can persist for weeks, months, or even years.
	The Indian Council of Agricultural Research (ICAR) - Central Marine Fisheries Research Institute (CMERI) 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.
India at 19th Interpol Conference of Heads of National Central Bureau	Online radicalization remains a major global security challenge. Internet platforms , especially social media, are utilized by terrorists for radicalization, indoctrination, recruitment, and financing of terror activities.
	Interpol, established in 1923, is an inter-governmental organization facilitating information exchange 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). The NCB serves as the country's focal point for all Interpol activities, with the Central Bureau of India (CBI) designated as India's NCB.

Reports/Study	Description																											
<p>2024 World Migration Report</p>	<p>By International Organization for Migration (IOM)</p> <p>Conflict and climate change stand as the chief catalysts behind global displacement, resulting in around 281 million international migrants globally, with 117 million individuals displaced, marking a historic peak.</p> <p>India, in particular, faces significant impacts, as climate factors notably influence internal migration from regions such as Rajasthan, Uttar Pradesh, and Madhya Pradesh.</p> <p>India hosts the largest population of international migrants worldwide, totalling 18 million, predominantly in countries like the UAE, USA, and Saudi Arabia.</p> <p>Furthermore, in 2022, India emerged as the foremost recipient of remittances, surpassing the significant milestone of receiving over USD 111 billion, indicative of its substantial role in the global migrant workforce and economy.</p> <p>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.</p>																											
<p>Recipe for a Livable Planet: Achieving Net Zero Emissions in the Agrifood System' report</p>	<p>By World Bank</p> <p>Key Findings include: The agrifood system contributes nearly one-third of global greenhouse gas emissions, spanning food production to disposal. Developing countries, notably India, contribute significantly, with 60% of India's emissions stemming from farm activities, especially livestock-related enteric fermentation.</p> <p>The report emphasizes carbon sequestration in agriculture, like reducing enteric fermentation and enhancing fertilizer efficiency, as critical mitigation strategies.</p> <p>World Bank (President: Ajay Banga; HQ: Washington DC; est. 1944) 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>NIT Trichy study on Urban Heat Island</p>	<p>A study by NIT Trichy reveals a stark contrast in pollutant levels between urban and rural areas, with urban regions experiencing notably higher concentrations.</p> <p>Aerosols, carbon monoxide (CO), and ozone (O3) directly contribute to the Urban Heat Island (UHI) phenomenon, 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 when cities are warmer than nearby rural areas due to the concentration of heat-absorbing surfaces 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> <table border="1"> <caption>Late Afternoon Temperature by Area</caption> <thead> <tr> <th>Area</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>~88</td> <td>~31.5</td> </tr> <tr> <td>Downtown</td> <td>92</td> <td>33</td> </tr> <tr> <td>Urban Residential</td> <td>~87</td> <td>~31</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>	Area	Temperature (°F)	Temperature (°C)	Rural	85	30	Suburban Residential	~87	~31	Commercial	~88	~31.5	Downtown	92	33	Urban Residential	~87	~31	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 Neglected Tropical Diseases (NTDs)	It aims towards the 2021–2030 Roadmap for NTDs. The roadmap aims for significant reductions in disease burden, elimination of certain NTDs from multiple countries , and global eradication of dracunculiasis and yaws.
	NTDs are a group of diverse infections caused by parasites, bacteria, viruses, and other pathogens that primarily affect populations in tropical and subtropical regions. These diseases often receive inadequate attention and resources , leading to limited research, diagnosis, and treatment options. Examples of NTDs include malaria, dengue fever, Chagas disease, leishmaniasis, etc
Agritech: Shaping Agriculture in Emerging Economies, Today and Tomorrow	Released by the World Economic Forum (WEF)
	This WEF report is part of its AI for Agriculture Innovation (AI4AI) initiative. This initiative aims to expand agritech services through public-private partnerships.
	In India, initiatives like Agri Stack, Agricultural Data Exchange (ADeX), and Digital Agriculture Mission (DAM) are facilitating the adoption of agritech by providing essential datasets and digital platforms for farmer services.
	The World Economic Forum (WEF) (HQ: Geneva, est. 1971; Founder: German engineer Klaus Schwab) is an international advocacy non-governmental organization and think tank
Amplifying the Global Value of Earth Observation Report	The report released by the World Economic Forum
	Earth Observation (EO) technologies gather data about Earth's natural and artificial features . EO includes remotely sensed data from satellites and in-situ data from sensors.
	EO could also help reduce over 2 billion tonnes of CO2 annually by 2030 through early warning systems and environmental impact monitoring.
	Global initiatives like MethaneSAT and Allen coral Atlas aim to address these challenges and leverage EO for various purposes.
Beyond Import Reduction: Shaping the Future of India's Toy Industry	Released by Global Trade Research Initiative (GTRI)
	It proposes a comprehensive strategy to develop India's toy industry and enhance exports. Measures to promote the local toy industry include increased import duties, quality control regulations, support schemes for toy clusters, and the National Action Plan for Toys (NAPT) .
	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 monetary policy transmission , according to the Reserve Bank of India (RBI) .
	Monetary policy transmission refers to the process through which changes in the central bank's monetary policy instruments, such as interest rates or reserve requirements, influence the broader economy , including inflation, output, and employment.
	RBI's report says that climate change directly affects inflation through adverse weather events, impacting agricultural production and global supply chains . Additionally, it can alter the Natural Rate of Interest (NRI) by undermining productivity and potential output due to extreme weather events.
	To address these challenges, adopting a green taxonomy and incorporating climate risk into modelling frameworks are suggested as the way forward.

14. 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.

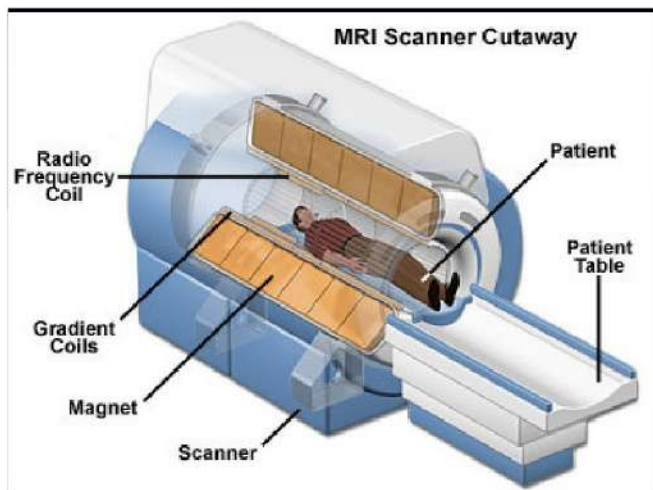
What is an MRI Scanner?

An MRI (Magnetic Resonance Imaging) scanner is a medical device that **uses a strong magnetic field and radio waves to 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.



15. 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 accom-

plished 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.

16. SECURE IOT

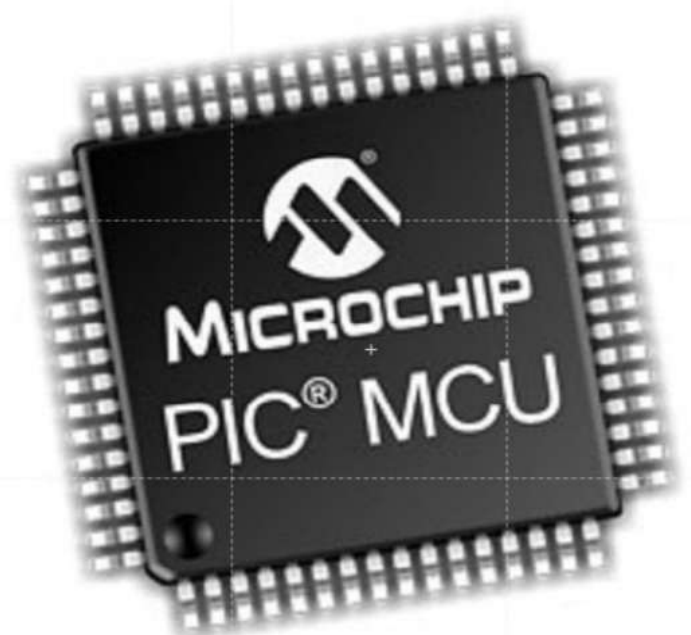
Context:

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.



17. 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



18. 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.

19. 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.

20. 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, investigation into causes of repatriation, and simplification of procedures to retain and attract foreign investors.

21. 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.

22. 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.

23. 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. How-

ever, 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 biofuels trade for a more sustainable future.

24. "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.

25. 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 disruptions 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% annu-**

ally, 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.

26. 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.**

27. SPERM WHALE

Context:

Scientists have uncovered a fascinating aspect of sperm **whale communication: their complex vocalizations resemble Morse code**, hinting at a sophisticated **"pho-netic 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.

28. 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.

29. 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 variety of foods to ensure a balanced diet
Pregnant women and new mothers should have access to extra food and healthcare

Ensure exclusive breastfeeding for the first six months ; continue breastfeeding till two years and beyond
After six months of age, the infant should be fed home-made semi-solid complementary foods
Ensure adequate and appropriate diets for children and adolescents in health and sickness
Eat plenty of vegetables and legumes
Use oil/fats in moderation ; choose a variety of oil seeds, nuts etc. to meet daily needs of fats and essential fatty acids
Obtain good quality proteins and essential amino acids ; avoid protein supplements to build muscle mass
Adopt a healthy lifestyle to prevent abdominal obesity, overweight and overall obesity
Be physically active , exercise regularly
Restrict salt intake
Consume safe and clean foods
Ensure appropriate pre-cooking and cooking methods are used
Drink plenty of water
Minimize the consumption of ultra-processed foods 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**.

30. 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
Efficiency	Moderate	High	High
Power Consumption	Moderate	High	Low
Optimization Focus	General computing	Graphics, complex computations	Neural network, AI computations

MAPPING

INTERNATIONAL

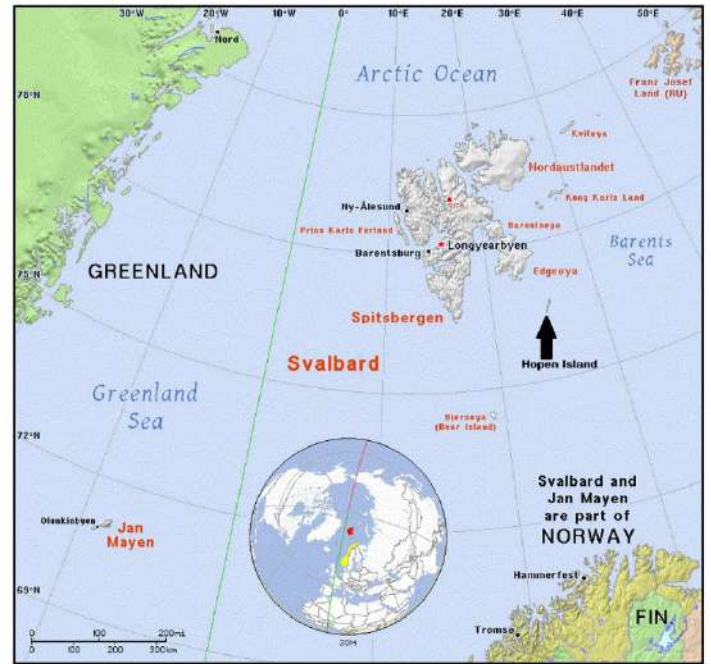
1. MOUNT RUANG (INDONESIA)

Context:

Indonesia's Mount Ruang volcano recently erupted, triggering the highest level of alert.

Indonesia is home to many volcanoes due to its location **along the Pacific Ring of Fire**, where several tectonic plates meet and interact. This convergence creates **intense geological activity**, including the subduction of oceanic plates beneath continental plates, which leads to volcanic eruptions. Indonesia has approximately 130 active volcanoes.

Mount Ruang is a **stratovolcano** situated in Indonesia's Sulawesi Islands. Other notable volcanoes in Indonesia include **Krakatau, Merapi, and Semeru**.



3. DARFUR (SUDAN)

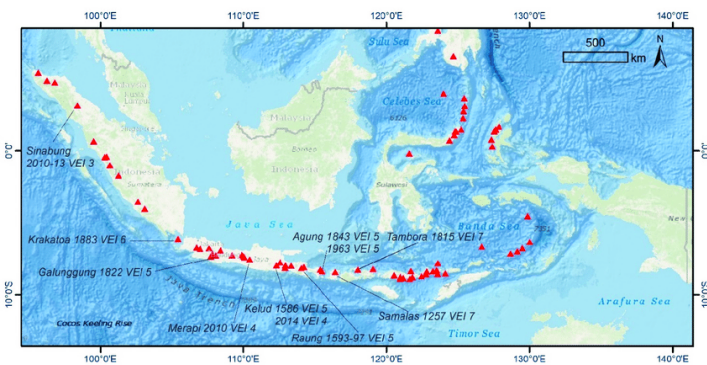
Context:

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.



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 walrus 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**

Sudan is a country in **North-east 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.

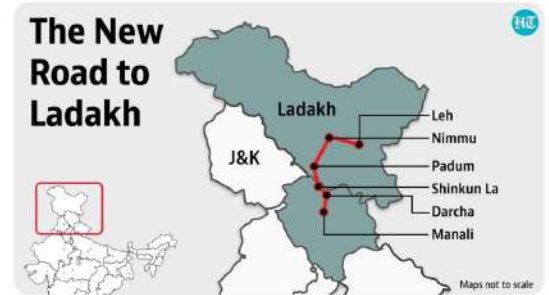
4. SHINKU LA TUNNEL

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.

Places	Description
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.

5. LIPULEKH, LIMPIYADHURA, AND KALAPANI (NEPAL)

Context:

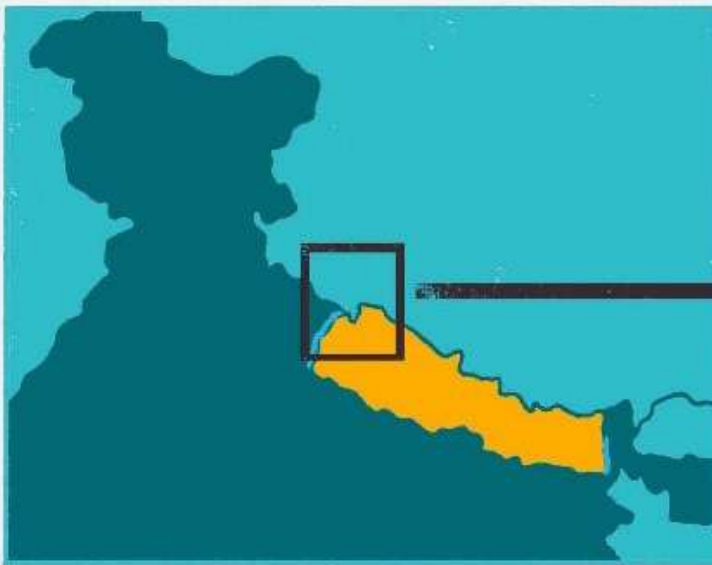
Nepal plans to introduce **a new Rs 100 currency note** featuring disputed territories with India, including **Lipulekh, Limpiyadhura, and Kalapani**.

- 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:

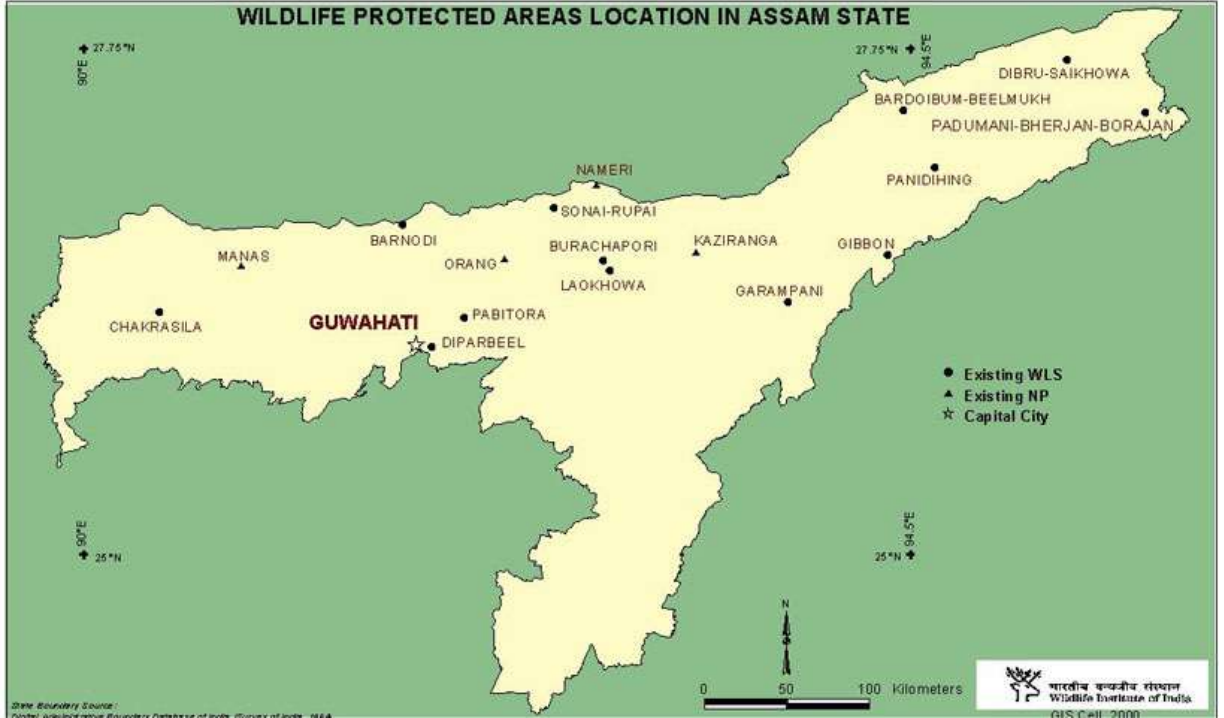
Kalapani is the largest territorial dispute between Nepal and India, situated at a tri-junction with Tibet (China). The disagreement stems from the **origin of River Kali, demarcated in the Treaty of Sagauli (1816)**. Nepal claims the river west of Kalapani as the main River Kali, **originating at Limpiyadhura or Lipulekh pass**, while India argues it originates from a rivulet named **Pankhagad**, defining the border differently.



Sonai Rupai Wildlife Sanctuary

The National Green Tribunal has taken note of **construction activities in 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**.

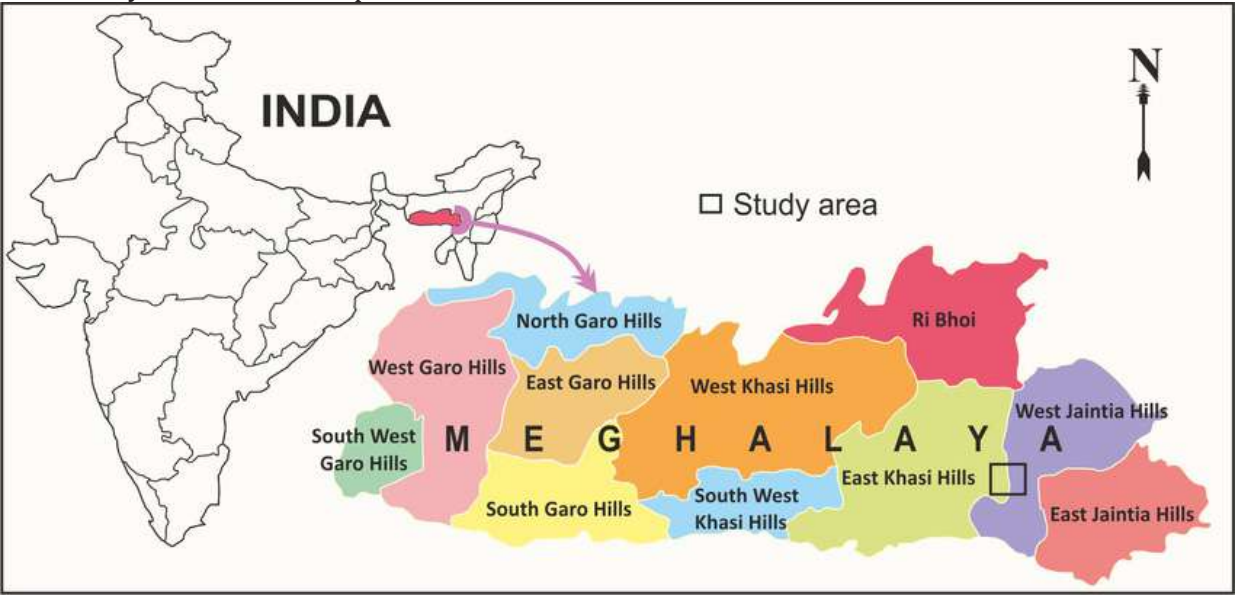


Meghalaya's East Jaintia Hills

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.

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.



**Aravalli re-
gion**

The Supreme Court has prohibited four states—**Delhi, Rajasthan, Haryana, and Gujarat**—from granting fresh mining leases in the 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