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Key Takeways of COP29

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Other topics
- SC Verdict on Private Property
- Sanctions and impact on Indian Economy
- National Mission on Natural Farming
- Rising STEM research demands revitalized education

A **MONTHLY PERIODICAL** FOR ASPIRANTS OF UPSC CSE

CONTENTS

1. POLITY & GOVERNANCE

1.1   VERDICT ON PRIVATE PROPERTY

Context
- In the Property Owners Association & Ors. v/s State of Maharashtra & Ors case, the Supreme Court's Nine-Judge Constitution Bench ruled that the government cannot seize private property by referring to it as "community resources" under Article 39(b) of the Constitution.

> **Background of the Case**
> - Property owners in Mumbai challenged the constitutionality of Chapter VIII-A of the Maharashtra Housing and Area Development Act (MHADA), which allows the government to acquire old buildings with the consent of 70% of the residents.
> - They claimed that this violated their constitutional rights to equality (Article 14) and the freedom to relocate and settle anywhere in India (Article 19). The Bombay High Court dismissed their petitions, leading an appeal to the Supreme Court.

Right to Property in the Indian Constitution
- The Right to Property was **originally a fundamental right guaranteed by Article 19(1)(f) and Article 31** of the Constitution.
- The **First Amendment (1951) amended Articles 19(1)(f) and 31 to allow the government to impose restrictions on property rights for the public good**, which enabled the implementation of land reforms.
- The **44th Amendment Act (1978) removed the Right to Property** from the list of fundamental rights. Articles 19(1)(f) and 31 were repealed, and Article 300A was added to make the Right to Property a legal right.

> **Current Status of the Right to Property**
> - **According to Article 300A, no person shall be deprived of their property except by law.** This provision guarantees legal protection against arbitrary seizures, but it does not provide the same level of protection as a fundamental right.
> - According to Article 39(b), the **state should make every effort to distribute ownership** and control of material resources to promote the public good.

Article 31C
- The **25th Amendment Act added Article 31C** to the Constitution to protect laws that implement directive principles of state policy, specifically Articles 39(b) and 39(c), from being challenged for violating fundamental rights under Articles 14, 19, and 31 of the Constitution.
- In the Kesavananda Bharati case (1973), the Court established the doctrine of basic structure, which states that certain fundamental features of the Constitution are beyond Parliament's amending power. The **court partially overturned Article 31C,** specifically the provision preventing laws from being challenged in court.
- **The 42nd Amendment Act (1976) extended Article 31C's protection to include all directive principles** of state policy (Articles 36-51) and shielded them from challenges under Articles 14 and 19.
- In the Minerva Mills Case (1980), the Supreme Court overturned several provisions of the 42nd Amendment Act, including Article 31C clauses.

Highlights of the Supreme Court Judgement

- The Court emphasized that **Article 31C still protects laws that implement Articles 39(b) and (c),** but only to the extent upheld in the Kesavananda Bharati case, indicating that such laws cannot be challenged under fundamental rights.
- The court clarified that **Article 39(b) defines "material resources of the community" which includes some privately owned resources, but this must be determined on a case-by-case basis**, taking into account the nature of the resource, its impact on the welfare of the community, resource scarcity, and the effects of its concentration in private hands.

Way Forward

- The Supreme Court decision strengthened the protection of private property rights under Article 300A of the Constitution and also allowed the government to acquire resources for the public good.
- This decision states that, while private property is protected, the government has the authority to acquire private resources if they benefit the public good, but only after considering specific factors such as resource scarcity and community impact.

1.2 SEX TRAFFICKING IN INDIA

Context

- The Supreme Court criticized the Union government for failing to meet a 2015 commitment to establish a specialized Organised Crime Investigative Agency (OCIA) to address sex trafficking.

Background of the Case

- In 2015, the **Supreme Court directed the Ministry of Home Affairs to establish an OCIA**, and the Ministry of Women and Child Development (MWCD) to draft comprehensive anti-trafficking legislation.
- The Lok Sabha passed the Trafficking of Persons (Prevention, Protection, and Rehabilitation) Bill in 2018, but it was not introduced in the Rajya Sabha, so it expired in 2019.

About Sex trafficking

- Sex trafficking is the illegal trade of individuals for sexual exploitation. Victims are forced to perform sexual acts without their consent.
- The United Nations Office on Drugs and Crime (UNODC) reports that **79% of all human trafficking cases involve sexual exploitation.** The majority of sex trafficking victims are women and girls. Forced labour accounts for 18% of all trafficking cases.
- According to the National Crime Records Bureau (NCRB) Report 2022, **more than 172 girls go missing every day**, 170 are kidnapped, and nearly three are trafficked.

Five states with most children trafficked
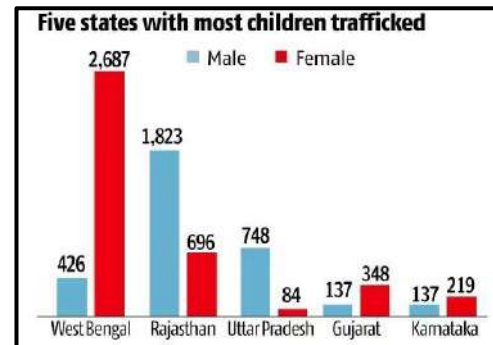
Root causes of human trafficking

- **Economic hardship** makes people more vulnerable to traffickers who promise better living conditions.
- **Lack of awareness of trafficking risks** (mostly in rural areas) increases vulnerability.
- Despite existing legislation, traffickers operate with little trouble due to **weak law enforcement**.

- Cross-border trafficking facilitated by India's borders with Bangladesh, Nepal, and Myanmar is a major issue.
- The **internet is increasingly being used by traffickers to exploit and attract victims**, making detection difficult.
- The **social stigma** surrounding trafficking victims prevents them from seeking help, which contributes to **underreporting.**

Constitutional and legislative provisions to address human trafficking

- Human trafficking is prohibited by Article 23(1) of the Constitution.
- The Immoral Traffic (Prevention) Act 1956 (ITPA) to prevent commercial sexual exploitation.
- Sections 370 and 370A of the IPC were added by the Criminal Law (Amendment) Act 2013 to address trafficking for sexual exploitation, forced labour, slavery, and other issues.
- The 2012 Protection of Children from Sexual Offences (POCSO) Act protects children from sexual abuse.

- The Prohibition of Child Marriage Act (2006) and the Bonded Labour System (Abolition) Act (1976) also address human trafficking issues.

Way Forward

- Awareness campaigns should be implemented to educate communities about the dangers of trafficking, with a focus on literacy and vulnerable areas.
- The **strict enforcement of laws** is essential to ensure that traffickers face severe penalties.
- Improving inter-agency coordination to effectively monitor trafficking activities.
- **Survivor-centered rehabilitation programs** should address the victims' mental health, education, and employment needs.
- Improve cross-border cooperation with neighbouring countries is required to combat transnational trafficking networks.
- Poverty alleviation and economic empowerment programs can help at-risk populations become less vulnerable to human traffickers.

1.3   SUPREME COURT UPHOLDS UP MADARSA ACT

Context

- The Supreme Court upheld the constitutionality of the Uttar Pradesh Board of Madarsa Education Act 2004.

Background

- UP Madarsa Act 2004 establishes the legal framework for Madarsa education, which includes religious education along with the curriculum established by the National Council of Educational Research and Training (NCERT).
- The Act was declared invalid by the Allahabad High Court, which argued that it violated secularism, the right to education, and conflicted with central laws. The Supreme

Court has now upheld the constitutionality of the Act.

The Supreme Court considered two major issues

- **Religious Education v/s Religious Instruction:** The court considered whether madrasas provided secular religious education or imposed religious instruction. The Constitution allows for religious education but not religious instruction (teaching to practice a specific religion) in state-recognized schools.
- **Should the entire law be struck down?** The court debated whether the entire law should be repealed, or if only certain problematic aspects of the law could be addressed while

madrasas remained open to ensure secular education.

Highlights of the Supreme Court judgment

- The Supreme Court upheld the constitutionality of the UP Madarsa Education Act.
- The court stated that **madrasas should also provide secular education to ensure that students receive an overall education** and that the Act must be implemented with appropriate regulations to balance religious and secular instruction.

- The court emphasized that secular principles should govern all institutions that provide religious education, including gurukuls and convent schools.

Way Forward

- The judgment clarifies the relationship between secular and religious education in India. It ensures that madrasas can continue to operate, but they must adapt their educational models to include secular subjects in accordance with the constitutional principles of secularism and the right to an education.

1.4   CHALLENGES IN URBAN LOCAL GOVERNANCE

Context

- The Comptroller and Auditor General (CAG) report found a 42% gap between resources and expenditure in Urban Local Bodies (ULBs) across 18 states.

CAG report highlights several challenges faced by ULBs

- **Only 32% of ULB revenue comes from self-generated sources**, and the rest 68% comes from central and state transfers.
- After the implementation of GST, ULBs lost key sources of revenue, including sales tax and local entertainment taxes.
- They **only collect 56% of the property tax revenue.**
- They have limited decision-making autonomy and heavily depend on state governments for financial and administrative support. This dependency limits their ability to respond quickly and effectively to the needs and demands of urban residents.
- They have an **average staff vacancy of 37% of sanctioned strength**, which limits their operational effectiveness.

Other Challenges Faced by Urban Local Bodies

Financial Challenges

- ULBs in India do not have extensive taxation powers in comparison to other developed countries. For example, in China, the majority of ULB revenue comes from the sale of land use rights; in Denmark, the local personal income tax; and in the United States, city governments can levy a wide range of taxes.
- **States have failed to establish state finance commissions on time.** According to the RBI report, the 15th FC's recommended grants to ULBs fell 15% short due to linked conditions.

Functional Challenges

- Various agencies established by the state government deny local governments functional autonomy. For example, the establishment of urban development authorities (for infrastructure development) and public corporations (water, electricity, transportation services, and so on).
- The power to delegate functions to local governments lies with the state government. **Most states have not delegated sufficient powers to local government bodies.**

Institutional Challenges

- The criminalisation of ULBs has increased as a large number of corporators with criminal and corrupt backgrounds are elected to corporations and councils.
- **Municipal governments have failed to plan thoroughly for all-around urban development.** These have resulted in the expansion of unchecked slums, traffic congestion, and colonies lacking basic necessities.
- **Poor coordination between the centre, the state, and various local departments** results in poor implementation of urban policies.

Way Forward

6th ARC Recommendations on Urban Governance

- A metropolitan planning committee to prepare development plans, review and coordinate the plans of various local bodies in India.
- The **Unified Metropolitan Transport Authority (UMTA) to integrate and manage public transportation services** and improve traffic management in the region.
- Conduct regular elections, delegate as many functions as possible to ULBs, and provide adequate resources.
- The National Urban Development and Housing Fund (NUDHF) to provide financial assistance to local governments for urban development and housing projects.

NITI Aayog Report on 'Reforms in Urban Planning Capacity in India' 2021

- ULBs must have adequate revenue-generating sources. The **Finance Commission must increase the central transfers of funds.** State finance commissions should be formed regularly and have clearly defined Terms of Reference (ToR).
- **Capacity-building programs must be developed for local government officials,** urban planners, and other urban governance stakeholders.
- Ward committees, as well as other mechanisms such as non-governmental organizations and civil society organizations, must be used to increase citizen participation in the functioning of ULBs.

CAG's Recommendations to Strengthen ULBs

- The recent CAG reports emphasized the urgent need for state governments to strengthen ULB autonomy and participation in critical areas such as urban planning. Stronger laws, policies, and institutional frameworks are essential for promoting economic, environmental, and democratically vibrant cities.

1.5   SHORT ARTICLES

Supreme Court Plenary Powers

Context

- The Supreme Court orders the liquidation of Jet Airways under its Plenary Powers.

About Plenary Powers under Article 142

- Article 142 empowers the Supreme Court to i**ssue any judgment or order required to ensure "complete justice"** in any case that is pending before it.
- It allows the Court to **go beyond statutory limitations** to provide "complete justice". The Court has the authority to act beyond the scope of legislation.
- "Complete justice" refers to the Supreme Court's discretion in ensuring fairness and equity in cases. This may require going beyond the written law to ensure that no one is denied justice.
- **Important Supreme Court Judgement:**
  o In **Union Carbide Corp v/s Union of India**, the Court ruled that Article 142 powers could supersede ordinary laws.

- o In Prem Chand v/s Excise Commissioner, the Court expanded Article 142's powers beyond procedural guidelines.
- In High Court Bar Association, Allahabad v/s State of Uttar Pradesh & Others, a five-judge Constitution Bench reinterpreted Article 142, ruled that it **should be invoked only in rare and exceptional circumstances.**

Aligarh Muslim University's Minority Status

Context
- The Supreme Court ruled that Aligarh Muslim University (AMU) can claim minority status under Article 30 of the Constitution.

Supreme Court Judgement
- The Court **overturned the 1968 decision in S. Azeez Basha v/s Union of India case,** which stated that AMU's minority status was terminated due to parliamentary legislation (Aligarh Muslim University Act, 1920) governing the university.
- The Court stated that an **institution's minority status is determined by its founder, not by government regulations or non-minority members of its governing body.**

About Minority Institution
- It is an educational institution founded and run by a minority community based on religion or language. It is recognized in Article 30 of the Constitution. However, the **Constitution does not define the term 'minority.'**
- **Article 29 protects minorities' right to preserve their language, script, or culture.** It ensures that no citizen is denied admission to a state-run educational institution or receives state aid because of religion, race, caste, or language.
- **Article 30 provides minorities the right to establish and manage educational institutions of their choice.** The state cannot interfere with the administration of these institutions or discriminate against them based on their minority status.

The National Commission for Minority Educational Institutions (NCMEI) was established by the National Commission for Minority Educational Institutions Act 2004 to protect minority educational rights, advise the government, and settle disputes about

How do minority institutions differ from other institutions?
- Minority institutions **do not have to maintain SC, ST, or OBC reservations** in admissions or employment.
- They can choose their own staff, including teachers and principals, without having to follow the seniority rules that govern state-run institutions.
- They can **reserve up to 50% of seats for students from their own community,** but they must admit a reasonable number of non-minority students if they receive state funding.

Standing Committee of the Inter-State Council (ISC)

Context
- The Union Home Minister has been appointed as the chairman of the Standing Committee of the Inter-State Council.

About Inter-State Council
- According to Article 263, an Inter-State Council can be formed "if at any time it appears to the President that the establishment of a Council would serve the public interest."
- It was **first established in 1990** by presidential order, following the **Sarkaria Commission's recommendation.**
- It mediates disputes between states, encourages dialogue, and makes recommendations for cooperative settlements. However, the recommendations are not binding on the government.
- **Members:** Prime Minister as Chairman, Chief Ministers of all states/UTs with legislative assemblies, Administrators of UTs without

legislative assemblies, Governors of states under President's Rule, Six central cabinet ministers, including the Home Minister, nominated by the Prime Minister.

- The Inter-State Council should meet three times per year. **Decisions are reached through consensus.**

Standing Committee of the Inter-State Council

- It was **established in 1996** to provide continuous consultation and process matters for the Council's consideration.
- It investigates and resolves Centre-State relations issues before presenting them to the ISC.
- It monitors the implementation of ISC recommendations.

AFSPA reimposed in some areas of Manipur

Context

- The Union Ministry of Home Affairs (MHA) reintroduced the Armed Forces (Special Powers) Act (AFSPA) in 5 districts of Manipur.

About Armed Forces Special Powers Act (AFSPA)

- In August 1942, the **British government passed the Armed Forces Special Powers Ordinance to suppress the Quit India Movement.** Following independence, the government executed the Ordinance to address internal security concerns during partition.
- According to Article 355 of the Constitution, the Central Government has the authority to protect each state from internal disturbances.
- In 1958, the Parliament passed AFSPA, which empowered the Armed Forces to maintain public order in "disturbed areas." **Once an area is designated as "disturbed," it remains so for at least six months.**
- The government's authority to declare an area "disturbed" under AFSPA is **not subject to judicial review.**

Special Powers to armed forces personnel under AFSPA

- Authority to **arrest anyone without a warrant** in a "disturbed area."
- Power to use force to maintain law and order, including firing after warning, even if it results in death.
- Authority to enter and search any location, including destroying shelters if necessary.
- They must turn over the arrested individuals to the officer in charge of the nearest police station.
- They have **legal immunity under AFSPA,** which means they cannot be prosecuted or sued for their actions.

SC guidelines on Illegal demolition

Context

- The Supreme Court established guidelines to ensure that the government does not demolish homes or private property only based on criminal allegations.

Supreme Court's guidelines

- Serve a show-cause notice and provide enough time for a response.
- Deliver notices by registered mail and affix them to the structure.
- In the notice, include information about the violations, the necessary paperwork, and the date of the hearing.
- **Hold a personal hearing** to explain the reasons for the demolition, if necessary.
- Video record the demolition process and create a detailed report.
- Use a digital portal to increase transparency during the demolition process.

About Bulldozer Justice

- "Bulldozer Justice" refers to the **practice of punishing suspected rioters or protestors by destroying their property without due process.**
- The Court issued the guidelines and highlighted that demolitions based solely on allegations violate constitutional rights, including:

- o Presumption of innocence of the accused.
- o Right to property under Article 300A.
- o Right to life, liberty, and shelter under Article 21.

> The Supreme Court's demolition orders do not apply to unauthorized structures in public places such as roads, footpaths, or railway lines, or in cases where a court has specifically ordered demolition.

NGOs and FCRA License

Context

- The Union Government issued new guidelines for NGOs under the Foreign Contribution (Regulation) Act (FCRA) 2010.

About New Guidelines

- The Ministry of Home Affairs laid out new circumstances under which an NGO's FCRA registration can be cancelled. This includes:
  - o **Engaging in anti-developmental activities** or forceful religious conversions.
  - o Disrupting social and religious harmony.
  - o **Diverting foreign funds** for anti-development activities or promoting violent protests.
  - o Using foreign contributions for personal gain by the organization or its leaders.
  - o Using funds for illegal purposes or maintaining links with terrorist or anti-national organizations.
  - o Failing to use foreign funds for projects that are in line with its stated goals and objectives.

Key Provisions of the Foreign Contribution Regulation Act (FCRA) 2010, and FCRA Amendment Act 2020

- Organizations and individuals **must register with the Ministry of Home Affairs** to receive foreign contributions.
- NGOs are **prohibited from transferring foreign contributions** to another organization unless it is also registered under the FCRA.
- Foreign contributions can only be used for the purposes for which they were received.

- NGOs must provide Aadhaar numbers for key members and identification for foreign members.
- All foreign contributions must be **deposited in a designated "FCRA account" at a specific State Bank of India branch in New Delhi.**
- The 2020 amendment expanded the list of individuals and organizations who are ineligible to accept foreign donations, including public employees, election candidates, media personnel, judges, and political parties.
- The **permissible administrative cost limit was reduced from 50% to 20% of foreign contributions by the 2020 amendment.**
- NGO registrations must be renewed within six months of their expiration date, with provisions for suspension or cancellation in the event of a violation.

Rights of Persons with Disabilities (Amendment) Rules 2024

Context

- The Union Ministry of Social Justice and Empowerment notified the Rights of Persons with Disabilities (Amendment) Rules, 2024.

Highlights of the Notification

Changes in the application process

- All applications must be submitted digitally via the UDID portal.
- Applications must be submitted to a designated medical authority in the applicant's district.
- Applicants must provide proof of identity, a recent photograph, and their Aadhaar number.
- If the medical authority does not decide within two years, the applications will be considered void.

Changes in the disability certificates and UDID cards

Color-coded UDID cards depending on the severity of disability:

- **White Card:** Disabilities under 40%.
- **Yellow Card:** Disabilities of 40% to 80%.

- **Blue Card:** Disabilities of 80% or more.

Rights of Persons with Disabilities Act 2016

- It was passed to fulfil India's obligations under the United Nations Convention on the Rights of Persons with Disabilities, which it **ratified in 2007.**
- It replaced the Persons with Disabilities Act, 1995.

Key Provisions

- **Increased the number of recognized disabilities from 7 to 21,** including Acid Attack Victims, Blindness, deafness, Parkinson's Disease, Haemophilia, etc.
- Defined benchmark disabilities as those with a **minimum of 40% of the specified conditions.**
- Mandated free education for children with benchmark disabilities aged 6–18 years.
- **Reserve 5% of seats in government and aid higher education institutions**, as well as **4% in government jobs** for individuals who possess benchmark disabilities.
- Mandates the formation of special courts in each district to address violations of the rights of people with disabilities.

Regional Council of Eastern Nagaland

Context

- The Nagaland government announced to submit feedback to the Union Government on increased autonomy for the Eastern Districts.

Demand for More Autonomy

- The demand for a separate state began more than a decade ago when the Eastern Nagaland People's Organization (ENPO) sent a memorandum to the Prime Minister's Office in 2010.
- The **demand is triggered by a "development deficit" in the region.** The ENPO advocated for a separate state with special status and provisions to address the lack of development in Eastern Nagaland.

Proposed Autonomy Arrangement

- The "Frontier Naga Territory" is being discussed as a "unique arrangement" with its legislature, executive, and financial powers. The deal includes an Eastern Nagaland-based regional council that has authority over local issues.
- The **proposed arrangement is consistent with Article 371(A) of the Constitution**, which provides for a regional council in the region. This would result in a more localized governance system for Eastern Nagaland.

> Under Article 371(A), the Nagaland government has special constitutional provisions protecting Naga customary law.

Rules under New Water Act

Context

- The Union Environment Ministry has issued new rules for conducting investigations and imposing penalties under the Water (Prevention and Control of Pollution) Act 1974.

Key provisions of the Water Act 1974

- It **establishes the Central Pollution Control Board (CPCB) and State Pollution Control Boards (SPCBs)** to monitor and regulate water pollution.
- The Appointments Committee of the Cabinet appoints the CPCB Chairperson, and State Governments select the head of SPCBs.
- It **allows the government to exempt specific industrial facilities** from discharge restrictions.
- It provides for a six-year prison sentence for discharging polluting matter.

Changes introduced in the Water Act under the 2024 amendments

- **Several violations were decriminalized** with monetary penalties ranging from Rs10,000 to Rs15 lakh instead of imprisonment.
- Failure to pay penalties can result in up to three years in prison or a fine equal to twice the penalty amount.

- The **Union government was given the authority to exempt certain industries from SPCB approval.**
- It empowers the **central government to set the process for nominating and appointing SPCB chairpersons,** previously made by state governments.
- The Union government appoints adjudicating officers to oversee the inquiry process, issue notices on alleged violators, and conduct **investigations within six months** of issuing the notice.
- If a government department violates the Act, the **head will be fined with one month's basic salary,** until they show that due diligence was used to prevent the violation.

Women Representation in Urban Local Bodies

Context

- According to Janaagraha, a non-profit organization, women make up 46% of urban councillors.

Key Highlights of the Report

- More than 60% of councillors in 19 of the 21 capital cities with active urban local bodies are female.
- **Tamil Nadu has the most female councillors in India.** The top 5 states with the most female councillors are Rajasthan, Madhya Pradesh, Maharashtra, and Andhra Pradesh.
- The 74th Constitutional Amendment Act of 1992 requires that women hold a minimum of one-third of all seats in urban local bodies (ULBs), however, **17 states have enacted legislation mandating 50% female representation in ULBs.**
- It suggests enacting a rural-urban transition policy to **promote the planned urbanization of rapidly urbanizing villages**, noting that many villages have already been converted into cities since the Census 2011.
- It recommends reorganizing the Ministry of Housing and Urban Affairs and state urban departments to:

  o Prioritize regional economies and local government.
  o Strengthen local self-government institutions.
  o Organize governance based on regions rather than sectors, schemes, or funding.
- It suggested **certification-based skill-building programs for ULB employees**, the establishment of municipal shared service centres, and the implementation of a digital public finance management system.

Copyright Law in India

Context

- The copyright dispute between Dhanush and Nayanthara originates from the use of a short video clip from a film in a biopic.

About Copyright Act 1957

- The main objective of the Act is to protect the rights of authors, composers, artists, designers, and other creative individuals to their original expression.
- The Act provides a copyright holder with **two types of rights:**
  o Section 14 specifies the **economic rights** of the copyright owner of original literary, musical, and dramatic works.
  o Section 57 protects **moral rights**, including the right to assert authorship and prevent others from claiming credit for the work. The right to integrity protects the work from being distorted or modified in a way that would be damaging to the author's honour or reputation.
- Section 63 provides criminal remedies for copyright infringement, including six-month imprisonment, fines ranging from Rs 50,000 to Rs 200,000, search and seizure of violating items.
- Copyright holders don't have complete control over their works. **Section 52 allows for 'fair dealing',** which allows copyrighted material to be used for specific purposes such

as commentary, criticism, and education without being considered a violation.

> **Berne Convention**
> India became a member of the Berne Convention for the Protection of Literary and Artistic Works (1886) in 1887. It ensures that foreign creators receive equal copyright protection in India as Indian creators.

Atal Mission 2.0

Context

- The Union Cabinet approved the continuation of the Atal Innovation Mission (AIM) until March 31, 2028.

About Atal Innovation Mission (AIM)

- It was **launched in 2016 by NITI Ayog** to promote an ecosystem of innovation and entrepreneurship in schools, universities, research institutions, MSMEs, and industries.
- Atal Tinkering Labs (ATLs) were established in schools to promote creativity and innovation by providing access to innovative equipment such as 3D printers, robotics, and the Internet of Things (IoT).

Atal Innovation Mission (AIM) 2.0

- AIM 1.0 focused on creating new innovation infrastructure, while **AIM 2.0 shifted its attention to guiding new initiatives to expand successful programs** through collaborations with central and state governments, industry, academia, and the community.
- AIM 2.0 aims to strengthen the innovation ecosystem by:
  - Increasing input (adding more innovators and entrepreneurs to the system).
  - Improving efficiency (raising the success rate of startups).
  - Improving productivity (creating better jobs, products, and services).

New initiatives under AIM 2.0

- The **Language Inclusive Program of Innovation (LIPI)** creates innovation ecosystems in 22 scheduled languages,

reducing barriers for innovators, entrepreneurs, and investors.
- The **Frontier Program** to create adapted innovation ecosystems in areas such as Jammu and Kashmir, Ladakh, the North Eastern states, and Aspirational districts.
- The **Industrial Accelerator Program** to increase industry involvement in the growth of advanced startups.
- The **Atal Sectoral Innovation Launchpads (ASIL) Programme** to establish platforms in central ministries for integrating and procuring from startups in key industry sectors.

Telecom Cybersecurity Rules

Context

- The Ministry of Communications has issued the Telecom Cyber Security Rules 2024 to protect communication networks and services.

Highlights of the Telecom Cyber Security Rules 2024

Data Collection

- The central government or its authorized agencies may request traffic and other data (excluding message content) from telecom companies.
- Telecom companies are required to make sure that the information they gather is securely stored and protected to prevent unwanted access.

Cybersecurity

- **Implement a telecom cybersecurity policy** that includes security measures, risk management protocols, training, and network testing.
- **Conduct vulnerability and risk assessments,** and implement security measures to prevent incidents.
- Take immediate action to reduce incidents and perform forensic analysis to improve future security.

Reporting

- Telecommunications companies must report security incidents to the government.
- **Initial report within six hours**, with details about the incident's nature and the impacted system.
- A **detailed report is to be provided within 24 hours,** including the number of users affected, the geographical impact, network or service disruption, and corrective actions taken.

Equipment Security

- Telecom equipment manufacturers must register International Mobile Equipment Identity (IMEI) numbers before selling it in India. **Tampering with IMEI numbers is not allowed.**
- Changing or removing identifiers for telecommunications equipment is strictly prohibited.
- The government can ban tampered equipment or require manufacturers to assist in resolving related issues.

SC verdict on Amendments to Preamble

Context

- The Supreme Court dismissed petitions challenging the use of the words 'socialist' and 'secular' in the Preamble of the Constitution.

Highlights of the Court Judgment

- The **Court upheld the use of the terms "socialist" and "secular" in the Preamble**. It stated that these terms are fundamental to the constitutional structure.
- The Court stated that the Constitution is a "living document" and that the power to amend it includes the Preamble.
- The Court explained that in India, the term "socialism" refers to a welfare state that provides equality of opportunity while allowing private enterprise and that India's version of secularism means that the state does not support or oppose any religion but treats all faiths equally.

Preamble of the Constitution

- On November 26, 1949, the original Preamble to the Constitution was adopted, declaring India a "sovereign, democratic republic." **It skipped the terms "socialist" and "secular."**
- During the 1976 Emergency, **the 42nd Constitutional Amendment included the words "socialist," "secular," and "integrity" in the Preamble** to reflect the state's economic and social policies, as well as to highlight the commitment to secularism.
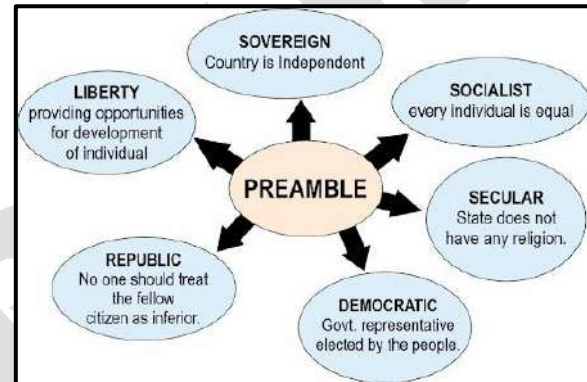
Supreme Court's Stand on Preamble

- In the **Berubari Union Case (1960),** the Court ruled that the Preamble is useful for understanding the minds of the Constitution's framers, however, it cannot be considered part of the Constitution.
- In the **Kesavananda Bharati case (1973),** the Court declared that the Preamble is a part of the Constitution and should be interpreted in light of the ideals it represents.
  - The Court also confirmed that the Preamble is subject to constitutional amendment; however, such amendments must not violate the Constitution's basic structure.
- In **Randhir Singh v/s Union of India (1982)**, the Court used the Preamble to interpret Article 39(d) of the Constitution, which requires equal pay for equal work. The case highlighted the importance of the preamble in interpreting constitutional provisions.

- The Court stated that the Preamble is an essential part of the Constitution in the **L.I.C. of India v/s Consumer Education & Research case (1995).**

SC verdict on Religious Conversion

Context

- The Supreme Court highlighted that religious conversion without genuine belief, mainly to receive reservation benefits, is against reservation policy and is a form of constitutional fraud.

Background of the case

- A woman from Puducherry claimed to have converted to Hinduism and appealed to a court for a Scheduled Caste community certificate. The court determined that there was insufficient evidence to support her conversion.

Highlights of the Court Verdict

- **Article 25 of the Constitution allows every citizen the right to practice and profess any religion of their choice.** However, the court clarified that conversion should be motivated by a genuine belief in the new religion's principles, rather than only to take advantage of reservation benefits.

- The Court acknowledged that **it cannot assess the sincerity or depth of a person's religious beliefs. However, courts can investigate the real motive behind a conversion** and determine whether it was a fraud intended for a hidden purpose.

Right to convert in India

- The **right to convert is not explicitly stated in the Constitution.** Article 25 does, however, include the right to "propagate" religion, which has been interpreted to include the right to convert others.

- Conversions for wrongful purposes, such as polygamy or receiving reservation benefits, are illegal.

- In **Sarla Mudgal v/s Union of India,** the Supreme Court ruled that marriages based on religious conversions for polygamy were invalid under the Hindu Marriage Act of 1955 and punishable as racist behaviour under the Indian Penal Code.

- In **Rev Stanislaus v/s State of Madhya Pradesh,** the Supreme Court ruled that the right to propagate religion does not include the right to convert others, because everyone has the same right to a free conscience.

1.6	SNIPPETS

Topics	Details
State of India's Under trial Prisoners	- The Home Minister stated that under trial prisoners who have served more than one-third of the maximum sentence for the crime they are charged with should be released. - According to the National Crime Records Bureau (NCRB), **Indian prisons had a 131% occupancy rate in 2022.** Under trials make up nearly 75.8% of these prisoners. - Section 479 of the Bharatiya Nagarik Suraksha Sanhita (BNSS) **allows first-time offenders and other under trials to be released after serving one-third of their maximum sentence.** This provision is similar to the previous Section 436A of the Criminal Procedure Code 1973.
National Anti-Doping Agency (NADA)	- The Union Minister for Youth Affairs and Sports asked the sporting community to use the National Anti-Doping Agency (NADA) India's 'Know Your Medicine (KYM)' app. - **India ratified the UNESCO Convention on Doping in Sports in 2007**. To meet its

	obligations, India established the National Anti-Doping Agency (NADA) in 2009.
	• NADA was established as an **autonomous body** in 2009 under the Society Registration Act of 1860 to regulate doping in sports.
	• The National Anti-Doping Act 2022 was approved to create the National Anti-Doping Board. **Key provisions** include;
	o International anti-doping conventions are legally binding.
	o Provisions for testing, investigations, adjudication, and penalties for violations.
	o NADA to implement anti-doping policies in all sports.
Grievance Redressal Assessment and Index (GRAI)	• The Union Minister of State (Independent Charge) Personnel, Public Grievances, and Pensions released the Grievance Redressal Assessment and Index (GRAI) 2023.
	• GRAI is a framework **created by the Department of Administrative Reforms and Public Grievances (DARPG)** to assess and rank the grievance redressal mechanisms of central ministries and departments.
	• **It evaluates performance across four dimensions**: efficiency, feedback domain, and organizational commitment.
	• The Department of Agriculture and Farmers Welfare led the rankings in GRAI 2023.
	• The **rankings are based on data from the Centralised Public Grievance Redressal and Management System (CPGRAMS),** an online platform launched in 2007 by the Ministry of Personnel, Public Grievances, and Pensions to allow citizens to file and track grievances.
Parakh Rashtriya Sarvekshan	• The National Achievement Survey (NAS) was renamed as PARAKH Rashtriya Sarvekshan.
	• Performance Assessment, Review and Analysis of Knowledge for Holistic Development (PARAKH) is an **assessment used to evaluate the learning achievements** of schoolchildren across India.
	• It is **managed jointly by the National Council of Educational Research and Training (NCERT) and the Central Board of Secondary Education (CBSE).**
	• It evaluates students' understanding of language, mathematics, science, and social science **in Classes 3, 6, and 9,** and offers national, state, and district report cards.
	• It has been **conducted every three years since 2001.**
Mission For Integrated Development of Horticulture (MIDH)	• The Union Government to incorporate four new components into MIDH: Hydroponics, Aquaponics, Vertical farming, and Precision agriculture.
	• MIDH is a **Centrally Sponsored Scheme (CSS) launched in 2014**-15 to encourage the production of fruits, vegetables, spices, flowers, mushrooms, aromatic plants, coconut, cashew, cocoa, and bamboo.
	• The Ministry of Agriculture and Farmers Welfare has allocated Rs 2,000 crore for MIDH in fiscal year 2024-25.
	• **India's horticulture production has surpassed food grain production**, making India the world's second-largest producer of fruits and vegetables.
Thadou Convention	• The Thadou Convention in Guwahati was held to preserve the tribe's distinct identity and heritage.

	• They emphasized that the Thadou tribe is distinct and independent from the Kuki tribe. • They demanded that the Thadou tribe be recognized as a distinct Scheduled Tribe in Assam, Mizoram, and Nagaland. • The **Thadou people mainly live in Northeast India**, Myanmar, and Bangladesh. The **majority (97.6%) live in Manipur,** where they are the largest single tribe in the state, making up around 19% of the Scheduled Tribes.
Indian Council of Social Science Research (ICSSR)	• Faculty and staff at ICSSR institutions have expressed concern about the delay in implementing the 7th Central Pay Commission's revised pay scales. • ICSSR is an **autonomous organization** established by the Union government in 1969 on the **recommendation of Prof. V. K. R. V. Rao Committee.** • It works **under the Ministry of Education.** • It supports social science research programs and projects. • It provides grants and fellowships for social science research. • It advises the Union Government on social science research issues.

1.7   ADDITIONAL TOPICS FOR READING FROM IASGYAN WEBSITE

TOPIC NAME	UPLOADED ON IAS GYAN WEBSITE ON
Indian Federalism is a Dialogue	4th November, 2024
Supreme Court's order on Mandatory Accessibility Standards	16th November, 2024
India's Urban Infrastructure Financing, Needs and Reality	26th November, 2024
Women who wrote Constitution of India	27th November, 2024
Right To Work Deleted	29th November, 2024

2. INTERNATIONAL RELATIONS

2.1 SANCTIONS AND IMPACT ON INDIAN ECONOMY

Context

- The United States has sanctioned over 400 organizations, including 19 Indian firms, for violating sanctions against Russia following Ukraine's invasion in 2022.

About Sanctions

- **Sanctions are financial and trade penalties imposed by one country on another entity,** such as a nation, corporation, or individual **to create pressure and persuade them to change certain actions.**
- When a country imposes sanctions, its citizens and organizations must comply with them. The targeted entity is subject to restrictions on trade, financial transactions, and other specified activities.
- They are **lifted once the targeted entity agrees to meet the requirements** and accept the terms established by the sanctioning party. Failure to comply may result in more severe sanctions.

US Sanctions

- The US law **Countering America's Adversaries Through Sanctions Act (CAATSA) imposes sanctions on Iran, North Korea, and Russia** to counter their activities that are viewed as a threat to American interests.
- The United States is the world's largest economy with a GDP of more than $28.78 trillion in 2024. The US dollar is the major global reserve currency, which accounts for about 60% of global foreign exchange reserves, **this gives the US significant power over the global financial system.**
- **US sanctions are supported by allies** including the European Union, Canada, Australia, and Japan. This coalition ensures effective implementation and increases global impact.

- The US utilizes its large economy, strong military, and alliances to **influence other nations to comply with its sanctions policies.**

USA Sanctions on Russia

- The US and its allies, including the EU, Japan, New Zealand, and Singapore, **imposed sanctions on Russia as part of a response to the Russian invasion of Ukraine.**
- Sanctions against the Russian central bank and sovereign wealth funds weaken the country's financial stability by limiting access to global financial markets and freezing significant assets.

Challenges for the Indian Economy Due to Sanctions

Impact on Trade

- Sanctions have **affected trade with Russia, Iran, and China**. For example, trade with Iran declined after the US reimposed sanctions in 2018, which affected oil imports and other goods.
- Sanctions against major markets, such as Russia, can **disrupt supply chains.** However, they can also create opportunities in alternative markets where competitors face restrictions.
- India imports more than 85% of its oil demand, but it **faces higher costs and supply disruptions when key suppliers such as Iran and Russia were sanctioned**. Following US sanctions on Iran, India had to source oil from alternative suppliers, which raised costs.

Economic Disruptions

- Sanctions complicate international payment systems, including the SWIFT network, making trade payments difficult for Indian businesses. It also **impacts foreign direct investment inflows to India.**

- Sanctions **increase the cost of essential commodities** such as oil, gas, and metals. Higher transportation and energy costs raise the prices of food and other necessities, affecting daily life.

Way Forward

- India is **diversifying its trade by strengthening ties** with the Middle East, Central Asia, and ASEAN countries, **reducing dependence on a single country or region**.
- Despite sanctions, India maintains strategic partnerships with countries such as Russia and Iran, while also growing balanced relations with Western nations.
- **India is developing alternative payment systems,** such as local currency trading. For example, the rupee-ruble trade with Russia reduces dependence on the US dollar and reduces the effects of sanctions.
- Under the Make in India and Atmanirbhar Bharat initiative, **India is increasing domestic production** in the defense, energy, and technology sectors to reduce dependence on imported goods.

2.2   REGIONAL COMPREHENSIVE ECONOMIC PARTNERSHIP (RCEP)

Context

- The NITI Aayog CEO advocated that India should Join the Regional Comprehensive Economic Partnership (RCEP).

About Regional Comprehensive Economic Partnership (RCEP)

- It is an **economic agreement** formed by the Association of Southeast Asian Nations (ASEAN) and their Free Trade Agreement (FTA) partners.
  - **10 ASEAN countries:** Brunei, Cambodia, Indonesia, Malaysia, Myanmar, Singapore, Thailand, the Philippines, Laos, and Vietnam.
  - **5 FTA partners:** China, Japan, South Korea, Australia, and New Zealand.
- It aims to **promote trade and investment among member nations** by reducing or eliminating tariffs and non-tariff barriers to promote smooth trade.
- It is the world's largest trading bloc, with **more than 30% of the global GDP and around one-third of the global population.**
- RCEP discussions began in 2012, it was signed in 2020 and came into effect in 2022. **India participated in the discussions but withdrew in 2019.**
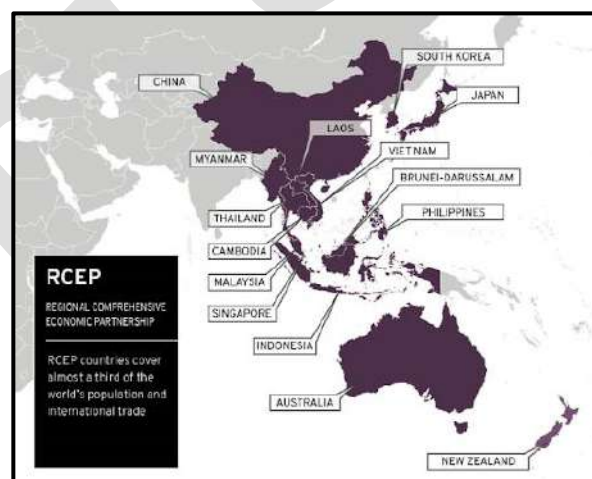
Why did India withdraw from RCEP?

- India adopted the global "China Plus One" strategy to diversify supply chains and reduce its dependence on China.
- **Trade imbalance with China reached $85 billion in 2023-24.** ASEAN's trade deficit with China increased from $81.7 billion in 2020 to $135.6 billion in 2023, raising concerns about similar trends in India under the RCEP.
- India was concerned that **goods would evade Indian tariffs by travelling through other member countries.**
- The dairy and steel sectors in India could face dangers if tariffs are reduced from 35% to zero. Cheaper imports from Australia and

New Zealand may increase pressure on domestic industries.

- India aimed to **protect its economy from external shocks and** maintain control over its trade policy.

Should India Join RCEP?

NITI Aayog

- Joining RCEP can **benefit Micro, Small, and Medium-Sized Enterprises (MSMEs)**, which account for 40% of exports. It would **increase market access and allow MSMEs to compete more effectively on a global level.**

- The "China Plus One" strategy is a global movement to diversify supply chains away from China. While countries such as Vietnam, Indonesia, Malaysia, Turkey, and Mexico have benefited from this approach in terms of investment and trade, India has yet to fully capitalize the opportunity.

- India's higher-than-average tariffs block trade paths and limit its participation in global value chains, which account for 70% of global trade. **Rationalizing tariffs and reducing trade barriers can help India integrate into these value chains.**

World Bank

- The World Bank's India Development Update report suggests that India should reconsider joining the RCEP. It highlights that **RCEP membership could boost India's trade, attract more investments, and contribute to economic growth.**

Way Forward

- India's participation in major trade agreements such as the RCEP has the potential to increase the inflow of foreign investment in domestic industries, improve trade liberalization, and expand global market access for Indian industries.

2.3   INDIA BANGLADESH RELATIONS

Context

- The Land Port Authority of India (LPAI) held a meeting with the Bangladesh Land Port Authority (BLPA).

About India-Bangladesh Relations

- In 1971, India was the first country to recognize Bangladesh as a separate nation, and it played an important role in the Liberation War.

- India is one of Bangladesh's largest trading partners, with **bilateral trade of value about $14 billion in 2023-2024.**

- Bangladesh is critical to India's security due to its vast land, riverine, and maritime borders with India. India seeks Bangladesh's cooperation in **countering China's "String of Pearls" strategy.**

- **Bangladesh is strategically important for India's "Act East Policy"** because it lies at the crossroads of South and Southeast Asia, making it a key partner in strengthening ties with Southeast Asian countries.

- India and Bangladesh collaborate on water management and flood control because they share Transboundary Rivers and ecological systems.

> **Land Port Authority of India (LPAI)**
> - It is a **statutory body** established by the Land Ports Authority Act 2010.
> - It reports to the **Ministry of Home Affairs.**
> - It is in charge of developing, upgrading, maintaining, and managing border infrastructure, which includes Integrated Check Posts (ICPs).

Major Initiatives

- The **Akhaura-Agartala rail link** strengthens connectivity between Bangladesh and India's Northeastern region, promoting regional integration and expanding trade relations.
- The **Comprehensive Economic Partnership Agreement (CEPA) 2022** aims to boost trade by lowering tariffs and encouraging investment in services, professionals, and goods. It aims to reduce bilateral trade deficits while increasing economic cooperation.
- The **BBIN Motor Vehicle Agreement,** signed by India, Bangladesh, Bhutan, and Nepal to allow cross-border vehicle movement to promote economic development by improving connectivity and regional integration.
- The **India-Bangladesh Friendship Pipeline** was inaugurated in March 2023 to transport high-speed diesel from India to Bangladesh, thus enhancing energy cooperation between the two countries.

Challenges

- **India and Bangladesh share 54 rivers, but only two water-sharing treaties have been signed**: the Ganga Waters Treaty and the Kushiyara River Treaty. Bangladesh seeks equitable distribution of Teesta River water, which is not accepted by India.
- **Cross-border terrorism and infiltration** raise serious internal security concerns in India, including armed robbery in border districts, illegal money transfers, cattle smuggling, and prostitution, stressing security relations.
- **China's Belt and Road Initiative (BRI) investments in Bangladeshi infrastructure,** including highways, bridges, and energy projects, are viewed as a threat to India's regional status and strategic interests.
- **Political instability in Bangladesh** after the resignation of former Prime Minister Sheikh Hasina and her stay in India has affected the relationship between India and the new Government in Bangladesh.

Way Forward

- India should **increase bilateral economic engagement with Bangladesh** without labelling political transitions as anti-India or anti-Hindu.
- To counteract China's growing influence, India should strengthen diplomatic, economic, and defense ties with Bangladesh, with a focus on infrastructure projects and defense cooperation.
- India and Bangladesh should form joint task forces with law enforcement agencies from both countries to combat cross-border drug trafficking, human trafficking, and illegal immigration.

2.4 PRIME MINISTER VISIT TO NIGERIA

Context

- The Prime Minister of India was awarded Nigeria's second-highest national honour, the "Grand Commander of the Order of the Niger" (GCON). Queen Elizabeth was the only foreign dignitary to receive the GCON in 1969.

Key Highlights of the Nigeria Visit

- India and Nigeria have committed to working together to combat terrorism, piracy, and radicalization, and to meet the Global South's aspirations.
- India has announced a **20-ton humanitarian aid package** to help flood relief efforts in Nigeria.

India-Nigeria Bilateral Relations

- India established its diplomatic house in Lagos in 1958. In 2007, the bilateral relationship was upgraded from "Historical Friendship" to "Strategic Partnership."
- In 2007, India and Nigeria signed a bilateral memorandum of understanding (MoU) on defense cooperation.
- The **bilateral trade volume between India and Nigeria was $11.8 billion in 2022-23.**
- More than 150 Indian companies are active in Nigeria, with a total investment of more than $27 billion.
- Nigeria has about 60,000 Indians, making it the **country's largest non-African community.**
- Capacity-building training programs under the Indian Technical and Economic Cooperation (ITEC) Program provide 250 civilian and 250 defense training slots each year.

About Nigeria

- Nigeria is located in West Africa, between the Sahel to the north and the Gulf of Guinea to the south in the Atlantic Ocean.
- **Bordering countries:** Niger, Chad, Cameroon, Benin
- Nigeria is Africa's most populous country and the sixth most populous in the world.
- The three largest ethnic groups in Nigeria are: Hausa, Yoruba, Igbo. Together, they make up more than 60% of the population.
- Nigeria has the fourth-largest economy in Africa.

Way Forward

- Nigeria's **economic potential and geopolitical significance** make it an important partner for India in trade, energy, defense, and development.
- Nigeria is a significant supplier of crude oil, which is essential for meeting India's energy requirements.
- **India can secure its national interests by investing in Nigeria's resources**, which include natural gas, tin, iron ore, coal, limestone, niobium, lead, and zinc.
- High-level engagements and strategic initiatives in hydrocarbons, defense, and economic partnerships can boost trade and strengthen bilateral relations.

2.5   INTERNATIONAL SOLAR ALLIANCE (ISA)

Context

- India and France have been elected as President and Co-President of the International Solar Alliance (ISA) for the next two years (2024-2026).

About International Solar Alliance (ISA)

- It was established by the Prime Minister of India and President of France in 2015 at the United Nations Climate Change Conference in Paris.
- It is a **treaty-based intergovernmental organization** with over 120 member countries, the majority of which are located between the Tropics of Cancer and Capricorn. **Countries outside the Tropics may join and receive the same benefits as other members, except voting rights.**

- **Main objectives**
  - Ensure $1 trillion in solar investments by 2030 through its 'Towards 1000' strategy, focusing on reducing technology and financing costs.
  - Provide 1 billion people with energy access and install 1,000 GW of solar energy capacity.
- Its **headquarters is located in Gurugram, Haryana.**
- It **works with bilateral and multilateral agencies to develop financial mechanisms** that provide low-cost, long-term funding for solar projects and investments.
- It encourages collaboration among R&D centers, application-oriented research, and capacity-building initiatives.

Initiatives launched at the 7th Session in New Delhi

- The **SolarX Startup Challenge** promotes innovative solar businesses in ISA member countries.
- The **STAR-C Initiative** seeks to improve solar technology skills in developing economies.
- The **Global Solar Facility** aims to encourage investment in underserved areas, particularly in Africa.

- The Viability Gap Funding Scheme provides grants for solar projects in the Least Developed Countries (LDCs) and Small Island Developing States.
- The **Solar Data Portal** provides real-time data to investors so they can make informed decisions about solar energy projects.
- The **International Solar Festival** promotes international collaboration on solar energy solutions.
- The **Green Hydrogen Innovation Centre** promotes cooperation between solar energy and hydrogen production.
- The ISA Knowledge Series and **World Solar Reports** promote research, insights, and market trends in the solar energy sector.

Challenges for the International Solar Alliance (ISA)

- **China's dominance in the solar supply chain creates vulnerabilities** for developing countries, including India, which heavily depend on Chinese solar technology and production.
- The involvement of profit-driven private companies may result in higher prices for consumers, mainly in rural areas where electricity is a basic necessity. **Balancing private investment, energy justice, and affordability continues to be a significant challenge.**
- **The acquisition of land for solar projects raises ethical concerns**. It has the potential to harm vulnerable ecosystems, contradicting the ISA's founding principles of addressing climate change and promoting sustainability.

Way Forward

- The ISA must **reduce dependence on a single country by encouraging a variety of investment sources** and promoting solar technology development in several regions.
- It should **prioritize environmental sustainability** and avoid causing harm to vulnerable ecosystems by ensuring ethical

- land acquisition practices and safeguarding traditional micro-economies.
- It needs to **ensure energy justice and affordability** by standardizing solar technology policies, providing transparent multi-stakeholder dialogues, and balancing private investment with mass affordability.

- The ISA's success will be determined by its ability to address geopolitical tensions, reduce financial barriers, promote equitable energy distribution, and put in place bottom-up approaches to energy justice and collaborative solutions.

2.6   SHORT ARTICLES

India-Middle East-Europe Corridor (IMEC)

Context

- An Indian delegation visited the UAE to discuss the status of the India-Middle East-Europe Economic Corridor (IMEEC).

India-Middle East-Europe Economic Corridor (IMEEC)

- It was **announced at the 2023 G20 New Delhi summit** to promote economic development by increasing connectivity and integration between Asia, the Persian Gulf, and Europe.
- India, the United States, the United Arab Emirates, Saudi Arabia, France, Germany, Italy, and the European Union are involved in IMEC.
- It is expected to **reduce transit time by 40% and costs by 30% when compared to the Suez Canal route.**

- It also includes **undersea data cables and long-distance hydrogen pipelines** to help achieve climate and decarbonization targets.
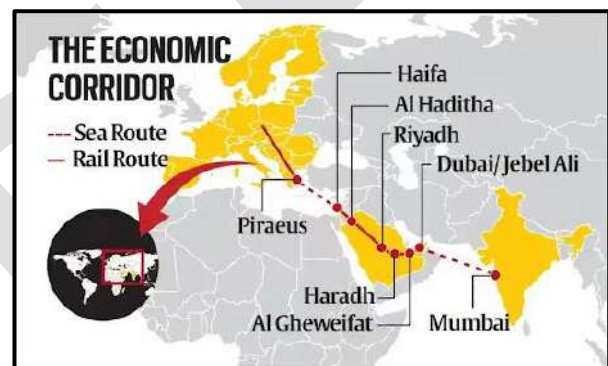
Proposed IMEC Route

- It aims to **improve transportation and communication between Europe and Asia through rail and shipping networks**, providing an alternative to the Suez Canal and countering China's Belt and Road initiative.
- **IMEC has two corridors:** The east corridor connects India and the Gulf, and the northern corridor connects the Gulf with Europe.
- The shipping route connects Mumbai and Mundra (Gujarat) with the UAE.
- A rail network connects the UAE, Saudi Arabia, and Jordan to the Israeli port of Haifa, which provides access to the Mediterranean Sea.
- Haifa is connected by sea to Greece's Piraeus port, which serves as a link to Europe via existing transportation networks.

International Energy Agency (IEA)

Context

- According to the International Energy Agency (IEA) report, the global market for clean energy technologies is expected to grow to $2 trillion by 2035.

About International Energy Agency (IEA)

- It is an **autonomous intergovernmental organization** formed in 1974 **under the Organisation for Economic Cooperation and Development (OECD).**
- It aims to provide policy guidance for energy security, accelerate the transition to clean energy and respond to energy crises.
- It publishes Energy Technology Perspectives, World Energy Outlook, Oil Market Report, and Net Zero Roadmap.
- It has 31 member countries and 13 associate countries, which collectively account for 75% of global energy demand. **In 2017, India joined the IEA as an Associate Member.**
- Its **headquarters are in Paris, France.**

Highlights of the Recent Report

- The global market for clean energy technologies is expected to **increase from $700 billion in 2023 to more than $2 trillion by 2035.**
- **China is expected to maintain its position as the world's largest manufacturer,** with exports exceeding $340 billion by 2035.
- Global investment in clean technology manufacturing increased by 50% in 2023, reaching USD 235 billion. **80% of the total investment went towards solar PV and battery manufacturing.**
- Production costs in the United States are 40% higher than in China, and about 25% higher in India.
- **Southeast Asia could become a low-cost producer of polysilicon and solar panel wafers**, while Latin America (particularly Brazil) could increase wind turbine production, and North Africa could emerge as an EV manufacturing hub.

Russia's New Nuclear Doctrine

Context

- The Russian President signed an updated nuclear doctrine.

Details

- Russia adopted the new doctrine in response to U.S. President Joe Biden's decision to allow Ukraine to use U.S.-supplied longer-range missiles to strike inside Russia. The update reflects the evolving geopolitical situation.

Key elements of the Updated Nuclear Doctrine of Russia

- A non-nuclear power attacking Russia with the assistance of a nuclear power will be considered a joint attack.
- Russia may use nuclear weapons if a conventional or nuclear attack threatens its sovereignty, territorial integrity, or the security of its ally Belarus.
- An attack by a member of a military bloc or coalition (for example, NATO) will be **interpreted as aggression by the entire bloc.**
- Russia could use nuclear weapons in response to a massive air attack involving planes, drones, ballistic and cruise missiles, or other flying vehicles.

> **India's Nuclear Doctrine**
> - **No First Use policy**, India will not use nuclear weapons unless it is attacked with nuclear weapons.
> - In response to a nuclear attack, India will launch a massive retaliatory strike that will cause tremendous damage.
> - The **Nuclear Command Authority (NCA) led by the Prime Minister** authorizes nuclear retaliatory attacks.
> - India strictly controls the export of nuclear and missile materials and technologies.
> - India prioritizes the peaceful use of nuclear energy and strives for a world without nuclear weapons.

EU's Draft AI Code of Practice

Context

- The European Union (EU) has published draft rules to implement the Artificial Intelligence (AI) Act.

EU's draft Code of Practice for AI companies

- It provides guidelines for companies developing general-purpose AI models to ensure compliance with the EU's AI Act.
- It stresses transparency, copyright regulation, risk assessment, and technical/governance risk mitigation.
- Its objective is to ensure that AI companies provide detailed information about their models, conduct risk assessments, and develop safety frameworks to manage systemic risks.
- Noncompliant companies could face **fines of up to €35 million or 7% of their global annual profits, whichever is greater.**

AI companies must follow following obligations:

- Use web crawlers that conform to the Robot Exclusion Protocol (robots.txt).
- **Provide detailed information about the data used** for AI model training, testing, validation, and results.
- Create and maintain a Safety and Security Framework (SSF) to evaluate and mitigate systemic risks during the pre-training, training, and deployment phases.
- Engage external experts to conduct independent testing and risk assessments on AI models.

European Union's AI Act

- It is the **first comprehensive legal framework governing artificial intelligence.**
- It categorizes AI systems into four risk levels: prohibited, high-risk, limited-risk, and minimal-risk, with different regulatory requirements.
- The Act aims to establish global standards for AI governance and influence AI legislation around the world.

Conflict in Sudan

Conflict

- Russia vetoed a UN Security Council draft resolution for a cease-fire in Sudan.

About Sudan

- Sudan is located in Northeast Africa and **shares borders with Egypt, Eritrea, Ethiopia, South Sudan, the Central African Republic, Chad, and Libya.**
- Its highest point is the Deriba Caldera in the Marrah Mountains.
- The Blue Nile originates from Lake Tana in Ethiopia and flows into Sudan.

- Lake Nubia lies on the Sudan-Egypt border.
- The Nubian Desert is located in Northeastern Sudan.

Sudanese Civil War

- The civil war is the result of political instability, ethnic tensions, and economic challenges.

- It was **started after Sudan's authoritarian president stepped down in 2019,** leaving a power vacuum.
- **Sudanese Armed Forces (SAF) and Rapid Support Forces (RSF)** engaged in a power struggle.
- SAF represents the traditional military, whereas the RSF is a paramilitary force based in conflict zones.
- The conflict revolves around political control and resource-rich areas, especially gold mines.
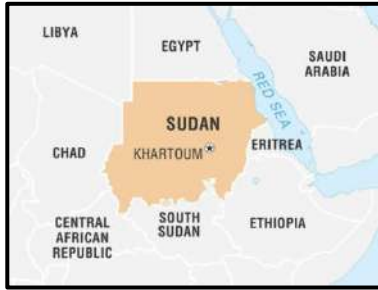
Riyadh Summit

Context

- Saudi Arabia hosted the Riyad summit for Arab and Islamic leaders to discuss the Palestinian issue.

About Gaza War

- The Gaza War is an ongoing conflict between Israel and Hamas, the militant group that controls Gaza.
- It started on October 7, 2023, with a Hamas attack on Israel, which prompted extensive Israeli airstrikes and ground attacks in Gaza, leading to a severe humanitarian crisis.

About Riyadh Summit

- The summit **called for an immediate end to Israel's military aggression** against Gaza and Lebanon.
- It called for the **establishment of an independent Palestinian state** based on the

1967 borders, with East Jerusalem as its capital.

- It highlighted the importance of **resolving the Palestinian issue for achieving long-term peace in West Asia.**
- The Arab Peace Initiative proposed recognizing Israel in exchange for a sovereign Palestinian state. Recent Arab normalization efforts with Israel had ignored this spirit, but the Riyadh summit repeated the importance of the Palestinian issue.

Abraham Accords

- The **Abraham Accords were signed in 2020 by the UAE, Bahrain, Morocco, Sudan, and Israel to normalize relations**, but it did not address the Palestinian issue.
- The Gaza War has disrupted the Arab-Israeli normalization process, prompting countries such as Saudi Arabia and the UAE to refocus on the Palestinian issue and conditions for future normalization process with Israel.

India makes Formal Bid to host 2036 Olympics

Context

- The Indian Olympic Association (IOA) submitted a 'Letter of Intent' to the International Olympic Committee (IOC) declaring India's interest in hosting the 2036 Olympics and Paralympics.

About Indian Olympic Association (IOA)

- It was **founded in 1927 and selects athletes to represent India at international athletic competitions** such as the Olympics, Asian Games, and Commonwealth Games.
- It receives funding from the Indian government, state governments, and various state sports federations.
- It recognizes 38 national sports federations, which are classified into two categories: Olympic Sports and Other Recognized Sports.
- It has hosted several multi-sport events, including the 1951 and 1982 Asian Games, the 2010 Commonwealth Games, and the South Asian Games.

International Olympic Committee (IOC)

- It was **established in 1894**, it is in charge of organizing the Olympics, as well as supervising the National Olympic Committees (NOCs).
- The **headquarters are located in Lausanne, Switzerland.**

Highlights of Rio G20 Summit

Context

- The leaders of the G20 met in Rio (Brazil) to discuss global trade, climate change, and international security.

About G20

- It is an **intergovernmental organization founded in 1999** in response to the global economic crisis.
- It has **21 members, including 19 sovereign countries, the European Union (EU), and the African Union (AU).**
  - The sovereign members are Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, the United Kingdom, and the United States.
- They account for about **85% of global GDP, 75% of international trade, 56% of the world's population, and 60% of the land area.**
- Its objectives are to promote global economic growth, address climate change and sustainable development, coordinate crisis responses, strengthen multilateral cooperation, and represent both advanced and emerging economies, including the Global South.

Key outcomes of the G20 Summit

- Members **acknowledged the need to increase climate finance** but did not specify who would provide the funds.
- They **supported peace initiatives in Ukraine** and condemned the use of force for territorial acquisition, but did not address Russian aggression.
- They **advised ceasefires in Gaza and Lebanon**, and supported a UN-backed agreement in Gaza.
- They **agreed to effectively tax ultra-high-net-worth individuals** while respecting tax sovereignty.
- The Brazilian president announced a **global anti-hunger alliance** with India as the founding nation to fund and replicate successful programs to reach half a billion people by 2030.

Mobility Arrangement for Talented Early-Professionals Scheme

Context

- Australia has launched a new program called "MATES" to allow talented young people from India to work in Australia for two years.

About MATES Scheme

- The scheme was **launched as part of the Migration and Mobility Partnership Arrangement (MMPA) signed by Australia and India in 2023.**

Eligibility for MATES Visa

- Applicants must be Indian nationals aged 30 or younger at the time of application.
- Have graduated within the last two years from an eligible educational institution at the time of application.
- Graduates from one of India's top 100 universities, as listed in the National Institutional Ranking Framework (NIRF) 2024. The **Ministry of Education (MoE) implemented the NIRF in 2015 to evaluate and rank higher education institutions in India.**
- Previous MATES participants are not eligible to reapply.
- The visa will be **granted through a ballot system** where applicants are chosen at random. The pilot program will offer **3,000 applicant places each year.**

Advantages of the MATES Scheme

- It allows participants to live and work in Australia for up to two years.

- Participants may work in any field, including those unrelated to their qualifications.
- Dependents (spouses and children) are allowed to stay with participants and work in Australia.
- Participants who meet the new visa requirements may apply for another visa to extend their stay.

Countries adopt Article 6 at COP29

Context

- The United Nations Framework Convention on Climate Change (UNFCCC) COP29 adopted Article 6 of the Paris Agreement, which allows countries to work together voluntarily through carbon markets to meet their Nationally Determined Contributions (NDCs) to reduce emissions.

Paris Agreement

- It is a **legally binding international treaty** on climate change adopted in 2015 and implemented in 2016.
- The long-term goal is to keep global temperature rise below 2°C above pre-industrial levels, with a preference for 1.5°C.

Nationally Determined Contributions (NDCs)

- NDCs are the foundation of the Paris Agreement, which **aims to limit global warming to 1.5°C.** Countries must **update their NDCs every five years**, with each new commitment stronger than the previous one.
- NDCs outline how countries intend to reduce emissions and adapt to climate change impacts, including the policies and measures required to meet global targets.
- The next round, **"NDCs 3.0," is scheduled for early 2025,** taking into account the Global Stocktake (GST) evaluation.

Agreement on carbon markets at COP29

- COP29 established a **supervised UN carbon market under Article 6 of the Paris Agreement,** allowing countries to trade carbon credits to meet emission targets.

- **Article 6.2 allows for bilateral agreements on carbon trading,** while **Article 6.4 establishes a global carbon market.** This agreement seeks to strengthen global cooperation on emission reductions through carbon trading.
- Article 6.4 is not expected to become operational until late 2025 or 2026. Due to the delays in finalizing the framework and standards, new carbon credit projects may be unable to register until at least 2026.

India UAE Bilateral Investment Treaty (BIT)

Context

- The Bilateral Investment Treaty (BIT) between India and the UAE replaced the Investment Treaty of 2014.

About Bilateral Investment Treaties (BITs)

- They are international agreements that protect investors from one country investing in another (the host country).
- It provides investors with access to international arbitration, which transfers disputes from host nation courts to a neutral forum.

About India-UAE BIT 2024

- It replaced the previous Bilateral Investment Promotion and Protection Agreement (BIPPA) of 2013.
- It aims to increase bilateral trade and investment with a **target of $100 billion in bilateral trade by 2030.**
- It promotes infrastructure development, including digital and payment platforms, as well as sectors like food processing and logistics.

Key provisions of the India-UAE BIT 2024

- The treaty protects investors' assets and investments in accordance with international laws.
- Investors are entitled to equal treatment as local investors and prohibits arbitrary or discriminatory treatment by the host nation.
- Certain areas, such as taxes and subsidies, are exempt from the treaty's provisions.

- The **treaty reduces the exhaustion period for local remedies from five years (as in the 2015 Model BIT) to three years** before an investor can seek international arbitration.
- It **bans third-party funding** in investor disputes.

UNICEF's State of the World's Children 2024 (SOWC-2024)

Context

- According to UNICEF's State of the World's Children 2024 (SOWC-2024) report, almost half of all children live in countries vulnerable to climate and environmental disasters.

Key Highlights of the Report

Health Issues

- Children's brains, lungs, and immune systems are highly susceptible to environmental hazards like pollution and extreme weather.
- Air pollution impacts respiratory health and development, and rising temperatures promote the spread of diseases like malaria and dengue.
- Floods contaminate water supplies, resulting in waterborne diseases.
- Extreme weather events reduce food production, leading to food insecurity.

Education

- **Severe weather has forced 400 million students worldwide to miss school since 2022**. This limits educational opportunities, violates children's rights, and restricts economic growth.
- **Technology**
- Artificial intelligence (AI), neurotechnology, next-generation renewable energy, and vaccine innovations have the potential to transform children's lives by improving education, healthcare, and resource access.
- The digitalization of society can empower children, but it also exposes them to online risks such as sexual exploitation and abuse.

Urbanization

- **By the 2050s, 60% of children will live in cities**, up from 44% in the 2000s.

Digital Divide

- The digital divide is a major concern, with **95% of people in high-income countries having internet access compared to only 26% in low-income countries.**

Projections for the 2050s

- The global child population is expected to reach 2.3 billion by the 2050s.
- South Asia, Eastern and Southern Africa, and West and Central Africa will continue to struggle to provide basic needs for their children due to significant climate risks and inadequate digital infrastructure.
- Newborn survival rates are expected to exceed 98%, and a child's chances of reaching the age of five will rise to 99.5%.
- **Life expectancy for girls and boys will increase to 81 and 76 years,** respectively, from 70 and 66 years for those born in the 2000s.
- By the 2050s, 23% of the world's children are expected to live in low-income countries, almost double the figure from the 2000s.

Process of withdrawal from the Paris Agreement

Context

- Argentina plans to withdraw from the Paris Agreement.

About The Paris Agreement

- It is a **legally binding international agreement under the United Nations Framework Convention on Climate Change (UNFCCC) adopted in 2015**. It was adopted at UNFCCC COP 21.
- It aims to address climate change and limit global warming to well below 2°C above pre-industrial levels, to limit warming to 1.5°C.
- It establishes a framework for countries to collaborate to reduce greenhouse gas emissions, adapt to the effects of climate change, and assist developing countries in their efforts to combat climate change.
- The Paris Agreement requires every member country to submit and update its Nationally

Determined Contributions (NDCs) every five years, outlining plans for reducing greenhouse gas emissions and adapting to climate change.

How does a country withdraw from the Paris Agreement?

- **Article 28 of the Paris Agreement outlines the procedure** and timeline for a country's withdrawal from the treaty.
- The article states that "a Party may **withdraw from this Agreement at any time after three years** from the date on which this Agreement has entered into force (2016) by giving written notification to the Depositary."
- If a member state wishes to withdraw from the treaty, it must **submit a withdrawal notification to the UN Office of Legal Affairs,** which is based at UN Headquarters in New York.
- Once the withdrawal notification is received, **it becomes effective after one year** (or later if the member state specifies in the notification).
- Until the withdrawal takes effect, the member state remains a party to the Paris Agreement and must fully participate in all of its activities.

Global Alliance against Hunger and Poverty

Context
- The Global Alliance Against Hunger and Poverty was officially launched during the G20 Leaders Summit in Rio de Janeiro, Brazil.

About Global Alliance Against Hunger and Poverty
- **Brazil proposed the alliance** to connect countries experiencing hunger and poverty with public policies to bring together partners willing to contribute expertise or financial support.
- The Alliance's primary goal is to **end hunger and poverty by 2030**, in accordance with the 2030 Agenda for Sustainable Development, which was adopted by all UN member states in 2015.

Objectives
- Organize global political campaigns to combat hunger and poverty. Collect domestic and international resources for country-led efforts to address hunger and poverty.
- Implement programs, such as food assistance, social protection schemes, school meals, support for smallholder farmers, and maternal and early childhood nutrition.

Working
- Offers technical expertise and financial assistance to countries in the development of national frameworks for eradicating hunger and poverty.
- It serves as a "matchmaker," **connecting countries in need with donors and technical support.**
- It has identified an evidence-based policy basket containing over 50 policy instruments that member countries can support.

Sprints 2030
- Six "Sprints 2030" programs will **concentrate on high-impact areas, with targeted initiatives aimed at the most vulnerable.** These include school meals, cash transfers, smallholder and family farming assistance, socioeconomic inclusion programs, integrated maternal and early childhood interventions, and water access solutions.

Finance
- Resources are gathered from the Alliance's member countries and institutions, such as the FAO, UNICEF, and the World Bank.
- **It does not have a separate fund;** rather, it connects countries with potential donors and financial partners.
- Its annual operating costs are expected to range between $2 and $3 million.

Members
- The Alliance has 148 members:
  o 82 countries, including India and others from the Global South.
  o 24 international organizations, including the Food and Agriculture Organization (FAO), UNICEF, and the World Bank.

- o 9 financial institutions and 31 philanthropic organizations.
- It is **open to all UN member and observer nations, development partners, and research institutions.**

Prime Minister visit to Guyana

Context

- Prime Minister Narendra Modi is the first Indian Prime Minister to visit Guyana in 56 years.

About India-Guyana Relation

- Diplomatic relations started in 1965 with the establishment of the Indian Commission in Georgetown.
- **Almost 40% of Guyana's population is of Indian origin.**
- India donated 80,000 doses of the Covishield vaccine to Guyana through Vaccine Maitri as part of its global vaccination campaign., and also donated $1 million to improve healthcare infrastructure in response to COVID-19.
- India has provided significant development assistance to Guyana through the Indian Technical & Economic Cooperation (ITEC) program.

> Guyana is establishing itself as a global oil hub, with rising oil production. **India sees this as an opportunity to diversify its crude oil imports.**

Recent visit significance

- The Indian Prime Minister became the **fourth foreign leader to be awarded "The Order of Excellence" by the President of Guyana.**
- India and Guyana have signed a Memorandum of Understanding (MoU) to strengthen cooperation in a variety of sectors, including health and pharmaceuticals, hydrocarbons, agriculture, banking, and payments.
- India has committed to **establishing a Jan Ausadhi Kendra in Guyana** to improve access to affordable medicines.
- **Both agreed to work together on crude sourcing, natural gas** infrastructure development and the entire hydrocarbon value chain.
- Guyana has announced plans to improve its banking and payment systems by implementing India's UPI-based real-time payment system.

India Caricom Relations

Context

- The Prime Minister attended the second summit of the India-Caribbean Community (CARICOM) in Georgetown, Guyana.

About CARICOM

- CARICOM (Caribbean Community and Common Market) was **established in 1973 through the Treaty of Chaguaramas in Trinidad and Tobago.**
- **It has 15 member countries**, including Antigua and Barbuda, the Bahamas, Barbados, Dominica, Guyana, Haiti, Jamaica, and Trinidad and Tobago. The Secretariat is based in Georgetown, Guyana.
- It has been granted **official observer status in the United Nations General Assembly.**

India-CARICOM Relations

- The India-CARICOM Joint Commission held its first summit in Guyana in 2015 to strengthen cooperation in trade, capacity building, and regional integration.
- The **first India-CARICOM Summit was held in New York in 2019.**
- During the **second India-CARICOM Summit in Guyana** in November 2024, the Prime Minister proposed seven key pillars for strengthening relations between India and the Caribbean Community (CARICOM). The acronym C-A-R-I-C-O-M represents the seven key pillars:
  o Capacity Building
  o Agriculture & Food Security
  o Renewable Energy and Climate Change
  o Innovation and Technology.
  o Cricket & Culture
  o Ocean Economy
  o Medicine and Healthcare

2.7   SNIPPETS

Topics	Details
ADMM-Plus Summit	• The Defence Minister attended the 11th ASEAN Defence Ministers Meeting (ADMM-Plus) in Vientiane, Laos. • It is a forum for ASEAN and its eight Dialogue Partners, including Australia, China, India, Japan, New Zealand, the Republic of Korea, Russia, and the United States to promote dialogue and collaboration. • The **first ADMM-Plus event was held in Ha Noi, Vietnam, in 2010.** • The main objective is to promote regional peace and stability, encourage defence and security cooperation, and address transnational security challenges.
Design Law Treaty	• India signed the Riyadh Design Law Treaty (DLT) to promote inclusive growth and boost its intellectual property (IP) ecosystem. • The Riyadh Design Law Treaty (DLT) was **adopted by the member nations of the World Intellectual Property Organization (WIPO).** • It aims to empower the stakeholders by lowering administrative costs and increasing their ability to protect their designs on a global scale. • It is expected to empower Indian MSMEs and startups by improving design protection, promoting the acquisition of design rights on a global scale, and increasing competitiveness.
UNSC Resolution 1701	• Israel and Lebanon agreed to a ceasefire proposal based on the provisions of Resolution 1701. • The UN Security Council unanimously adopted Resolution 1701 in 2006 to end hostilities between Israel and Hezbollah by **establishing a permanent cease-fire and creating a buffer zone along the Israel-Lebanon border.** • It mandated the United Nations Interim Force in Lebanon (UNIFIL) to monitor the cease-fire and assist Lebanon in maintaining stability. • It advocates for strict commitment to the **Blue Line (the border between Lebanon and Israel)** and the establishment of a demilitarized zone between the Blue Line and the Litani River.
Crimes against Humanity	• The UNGA committee passed a resolution to negotiate the first-ever treaty to prevent and punish crimes against humanity.

	• The resolution was **unanimously approved by the UNGA legal committee**, which is composed of all 193 United Nations members.
	• The resolution demands a time-bound process, including:
	  o Preparatory sessions in 2026 and 2027.
	  o The treaty on crimes against humanity will be finalized following negotiating sessions in 2028 and 2029.
	• The resolution was **led by Mexico and Gambia.**

Organisation for The Prohibition of Chemical Weapons (OPCW)	• The Indian Chemical Council (ICC) received the 2024 OPCW The Hague Award from the Organisation for the Prohibition of Chemical Weapons (OPCW). • The OPCW, under the Chemical Weapons Convention (CWC) 1997, prohibits the use and large-scale development of chemical weapons, except for limited purposes like research, or medical purposes. • It **shares its assessments and activities with the United Nations** through the Secretary-General's Office. • It was **awarded the Nobel Peace Prize in 2013** for its efforts to eliminate chemical weapons worldwide. • The headquarters are in The Hague, Netherlands.
Chalo India Campaign	• The "Chalo India Campaign" is a Ministry of Tourism initiative to attract foreign tourists, especially friends of OCI cardholders. • **Foreigners nominated by OCI card holders are eligible for free e-visas**. Each OCI cardholder may nominate up to five individuals. • OCI cardholders register on a portal and provide information about their nominated individuals. o After verification, they are given a unique code. The nominated friends can use this unique code to apply for a free e-visa. • Overseas Citizens of India (OCI) are foreign individuals who hold an OCI card, which grants them benefits such as a **lifetime visa to India and exemption from police registration.** • The **OCI card was introduced in 2005** for persons of Indian origin (PIOs) who were Indian citizens or eligible for citizenship on January 26, 1950.
World Cities Day	• World Cities Day is celebrated every year on October 31. • The United Nations General Assembly established **World Cities Day in 2013 with resolution A/RES/68/239.** • The United Nations Human Settlements Programme (UN-Habitat) observes World Habitat Day on October 31 every year. The inaugural World Cities Day took place in October 2014. • The theme for 2024 is **"Youth Climate Change makers: Catalyzing Local Action for Urban Sustainability."**
Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO)	• Earthquakes in Iran raised concerns about potential nuclear testing, however, the secretary of the CTBTO clarified that these were seismic events. • It is an international body in charge of **enforcing the Comprehensive Nuclear Test Ban Treaty (CTBT)** to prohibit all nuclear test explosions globally. • It is **headquartered in Vienna, Austria.**

	• The **treaty is not in force because it requires ratification by eight Annex-2 states**; these states have nuclear reactors or advanced nuclear technology; the **United States, China, Iran, Egypt, Israel, India, Pakistan, and North Korea.** • It monitors nuclear activity using the International Monitoring System (IMS), which consists of over 300 monitoring stations spread across 89 countries.
Indira Gandhi Peace Prize	• The Indira Gandhi Prize for Peace, Disarmament, and Development 2023 awarded to Daniel Barenboim and Ali Abu Awwad. • The Indira Gandhi Peace Prize, also known as the Indira Gandhi Prize for Peace, Disarmament, and Development, is **awarded by the Indira Gandhi Memorial Trust.** • It was **established in 1986 to honour Indira Gandhi**, India's former Prime Minister, who was assassinated in 1984. • **Daniel Barenboim** received the award for his work to promote peace through musical and cultural dialogue initiatives. • **Ali Abu Awwad** was honoured for his support for dialogue through Roots, which he founded after serving time in an Israeli jail.
Asia Pacific Tele-community (APT)	• The India Telecom Regulatory Authority (TRAI) hosted a multilateral event in New Delhi organized by the Asia Pacific Telecommunity (APT). • The **United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) and the International Telecommunication Union (ITU) collaborated** to establish APT as an intergovernmental organization in 1979. • APT currently has 38 members, 4 associate members, and over 140 affiliate members, including private companies and academic institutions involved in ICT. • **TRAI is a statutory body established under the Telecom Regulatory Authority of India Act 1997** to regulate telecom services, including tariff setting and revision.

2.8   ADDITIONAL TOPICS FOR READING FROM IASGYAN WEBSITE

TOPIC NAME	UPLOADED ON IAS GYAN WEBSITE ON
Balfour Declaration	5th November 2024
India under Trump 2.0	9th November 2024
Trade Wars	15th November 2024
Jaishankar-Modi Doctrine: India's 'Multi-Alignment' Approach	16th November 2024
Addressing Illegal Immigration, A Role For India, And Global Cooperation	26th November 2024
US Plans Tariffs On Canada Mexico And China	28th November 2024

3. ECONOMY

3.1   THE PARADOX OF STAGNANT RURAL WAGES

Context

- Despite the growth rate of the Indian economy at an average annual rate of 4.6% and the farm sector at 4.2% between 2019-20 and 2023-24, rural wages have stagnated or declined in real terms. This highlights a paradox: economic growth has not resulted in higher rural earnings.

The Labour Bureau data on State of Rural Wages (between April 2019 to August 2024)

- Nominal rural wages increased at an average annual rate of 5.2%.
- **Agricultural wages showed a slightly higher nominal growth rate** of 5.8%, indicating that agriculture has stronger labor demand than other sectors.
- **Rural workers' real wage growth was negative, at -0.4%,** indicating that inflation outpaced nominal wage increases, reducing their purchasing power.
- **Real wages for agricultural workers increased by 0.2%,** slightly compensating for the impact of inflation but still indicating limited improvement.

WAGE GROWTH IN RURAL INDIA FOR MEN

■ Rural Wages   ■ Agricultural Wages   (% year-on-year))

NOMINAL WAGE
10%
9.97 (Jun-2020)
8%
4.00   6.16
6%
3.87
4%
5.81
2%
-1.09 (Jun-2021)
0%
Apr 2019   Aug 2024

REAL WAGE
4.00% 2.13 -3.63 (Jun-2020) 2.00
2.00%
0.00%
-2.00% 2.00   1.65
-4.00%
-5.07 (Jun-2021)
-6.00%
Apr 2019   Aug 2024

Note: Nominal wages are simple arithmetic all-India average for rural male labourers across 25 agricultural and non-agricultural occupations. For real wages, the Consumer Price Index (Rural) has been used.

Reasons for Stagnation in Rural Wages

Labour Force Participation

- According to the Economic Survey for 2023-24, the **increase in female labor force participation (LFPR) from 26.4% in 2018-19 to 47.6% in 2023-24 has increased rural labor supply.** This increased labor supply has put downward pressure on wages, as more people are willing to work for the same or lower pay.

Agricultural Productivity

- Agriculture has low marginal productivity, which means that adding labor does not significantly increase output, this limits the ability to pay higher wages.

Technological Advancements

- Technological advancements, such as threshing machines and harvesters, have reduced the demand for rural labour. These technologies increased owners' profits, but limited wage growth and job creation in rural areas.

Non-Farm Job Opportunities

- Small-scale industries, cottage industries, and rural enterprises are underdeveloped because they lack the necessary support, infrastructure, and financing. This restricts job creation outside of agriculture, resulting in stagnant wages.

Wage Guarantee Programs

- The effectiveness of MGNREGA in providing reliable income support is limited by issues such as delayed payments, budgetary limitations, and corruption in its implementation.

Inflation
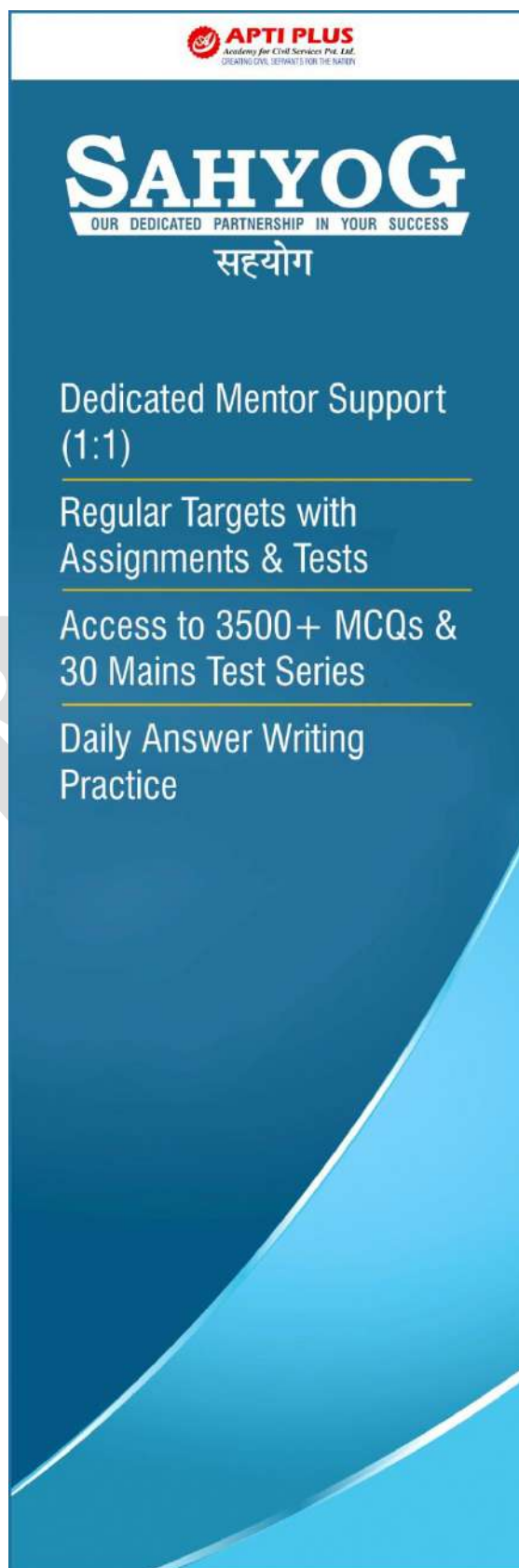
- **Inflation reduces real wages by surpassing nominal wage growth**. Rising prices for basic commodities, fuel, and other goods reduce rural workers' purchasing power.

Climate Change

- Droughts and floods are frequent climate events that reduce agricultural income, which makes it difficult for landowners to pay higher wages. This causes wage instability in the rural labour market.

Consequences of Rural Wage Stagnation

- It **limits the purchasing power of rural populations**, and this reduces demand for goods and services, particularly from small and medium-sized businesses, which slows economic growth.
- Stagnant wages and high inflation **drive rural households into debt cycles.** Families are forced to depend on informal lenders, which reduces disposable income and increases financial instability.
- With declining non-farm job opportunities and stagnant wages, many rural workers return to agriculture, even though it rarely provides sustainable incomes. This results in **underemployment and inefficient labour allocation.**
- Low wages and limited job opportunities in rural areas **drive workers to cities** in search of higher-paying jobs. This migration causes **overcrowding in urban areas,** putting pressure on infrastructure, housing, and public services.
- **Low wages limit access to basic services** such as

healthcare, education, and nutrition, particularly for children. This restricts human capital development and has long-term implications for rural development.

Way Forward

- **Expanding and increasing payments under schemes** such as PM-KISAN and free-grain distribution programs may reduce the financial burden on low-income families, increasing their purchasing power and reducing their dependence on wage stagnation.
- **Rural minimum wages should be regularly revised** based on inflation to ensure that they are in line with rising living costs.
- **Policymakers should encourage labour-intensive industries** like textiles, food processing, and tourism to create jobs. During recessions or seasonal unemployment, programs like MGNREGA can provide rural workers with stable employment and income security.
- The priority must be on increasing agricultural productivity through improved access to modern technology, efficient irrigation systems, and high-quality seeds to boost output and more stable rural livelihoods.

3.2 NATIONAL MISSION ON NATURAL FARMING

Context

- The Ministry of Agriculture and Farmers' Welfare launched the National Mission on Natural Farming (NMNF) as a Centrally Sponsored Scheme to promote chemical-free farming practices.

About National Mission on Natural Farming (NMNF)

- It will be implemented in 15,000 clusters across Gram Panchayats, with the goal of reaching 1 crore farmers and promoting Natural Farming (NF) on 7.5 lakh hectares of land.
- It will **work with existing programs and government structures** to create local markets, such as district/block/Gram Panchayat-level markets and Haats, to provide farmers with market access for their natural agricultural produce.
- **Assistance in preparing inputs such as Jeevamrit and Beejamrit**, as well as marketing their products through a simple certification system and shared branding.
- Around 30,000 **Krishi Sakhis/Community Resource Persons (CRPs) will be deployed to raise awareness**, mobilize farmers, and provide hands-on assistance to interested farmers.

About Natural Farming

- It is a **chemical-free farming system** that depends largely on on-farm biomass recycling, with a special focus on biomass mulching, the use of on-farm cow dung-urine formulations, soil aeration, and the elimination of all synthetic chemical inputs.
- It **reduces the need to buy inputs.** It is regarded as a low-cost farming practice with the potential to increase employment and rural development.

> The Union Budget for 2024-25 encourages natural farming by reducing fertilizer subsidies and highlighting natural farming as the foundation of India's low-carbon agricultural transition.

Improve Yield

Farmers practising Natural Farming reported similar yields to those following conventional farming. In several cases, higher yields per harvest were also reported.

Increased Farmers' Income

Natural Farming aims to make farming viable and aspirational by increasing net incomes of farmers on account of cost reduction, reduced risks, similar yields, incomes from intercropping

Minimized Cost Of Production

Natural Farming aims to drastically cut down production costs by encouraging farmers to prepare essential biological inputs using on-farm, natural and home-grown resources.

Ensures Better Health

As Natural Farming does not use any synthetic chemicals, health risks and hazards are eliminated. The food has higher nutrition density and therefore offers better health benefits.

Employment Generation

Natural farming generates employment on account of natural farming input enterprises, value addition, marketing in local areas, etc. The surplus from natural farming is invested in the village itself

Eliminates Application Of Synthetic Chemical Inputs

The overuse of synthetic fertilizers, especially urea, pesticides, herbicides, weedicides etc. alters soil biology and soil structure, with subsequent loss of soil organic carbon and fertility.

Environment Conservation

Natural Farming ensures better soil biology, improved agrobiodiversity and a more judicious usage of water with much smaller carbon and nitrogen footprints.

Reduced Water Consumption

By working with diverse crops that help each other and cover the soil to prevent unnecessary water loss through evaporation, Natural Farming optimizes the amount of 'crop per drop'.

Rejuvenates Soil Health

The most immediate impact of Natural Farming is on the biology of soil—on microbes and other living organisms such as earthworms. Soil health depends entirely on the living organisms in it

Challenges in expanding natural farming

- Farmers' ability to successfully adopt natural farming is hampered by **limited access to training and capacity-building programs.**
- Many farmers are hesitant to adopt natural farming due to **concerns about lower yields.**
- Issues arise from **irregular bio-input supply chains**, which make it difficult for farmers to maintain a consistent supply.
- Natural farming is **labor-intensive,** especially when it comes to preparing and applying bio-fertilizers such as 'Jeevamrit' and 'Beejamrit', which limits its widespread adoption without mechanization.
- Smallholders **may lack the financial resources** to switch to natural farming and face challenges in getting top markets due to limited certification and branding.

Way Forward

- **Developing strong bio-input supply chains** is critical to ensuring a consistent and dependable supply of essential inputs for natural agriculture.
- **Mechanization should be implemented** to reduce labor costs associated with natural farming practices, especially for bio-fertilizer preparation and application.
- **Building efficient distribution infrastructure** is essential for the success of large-scale natural farming, as it ensures farmers' access to markets and timely support.
- Farmers should be given financial assistance, grants, and access to modern agricultural technologies to help them transition to and succeed with natural farming practices.
- Policies should **prioritize improving market access** for natural farming products, allowing farmers to access larger, more profitable markets for their produce.

3.3 SHORT ARTICLES

Antitrust Laws in India

Context

- Swiggy and Zomato allegedly violated antitrust and competition laws by favoring specific restaurants on their platforms.

Antitrust Laws

- Antitrust laws seek to promote fair competition, protect consumer interests, and prohibit anti-competitive market practices.

Evolution of Antitrust Laws in India

- The **Monopolies Inquiry Commission (1965)** was established to investigate monopolistic practices in the market and recommend prevention measures.
- The **Monopolies and Restrictive Trade Practices Act 1969** aimed at avoiding monopolies, but it was ambiguous, failing to address issues such as cartelization and predatory pricing. It created bureaucratic barriers that slowed market expansion.
- Liberalization in the 1990s, due to domestic and global challenges, resulted in amendments to the MRTP Act, but these changes were insufficient to reflect the new economic environment.
- The **Raghavan Committee (2000) examined antitrust laws and recommended repealing the MRTP Act** and enacting new legislation to encourage market competition.
- The Competition Act 2002 aims to promote free trade with reasonable restrictions and creates a framework for regulating anti-competitive agreements, abuse of dominance, and mergers and acquisitions.
- **Under the Competition (Amendment) Act 2007, the Competition Commission of India (CCI) was established in 2009 as a statutory body within the Ministry of Corporate Affairs.** The CCI has the power to:
  o Investigate anti-competitive agreements and misuse of dominance.
  o Regulate mergers and acquisitions that adversely impact competition.
  o Enforce fair competition while protecting consumer interests.

State of Food and Agriculture 2024

Context

- According to a Food and Agriculture Organization (FAO) report, India's agri-food systems cost $1.3 trillion per year, mostly due to unhealthy dietary patterns.

Key highlights of the Report

- Unhealthy dietary patterns account for more than 73% of the hidden costs.
- Noncommunicable diseases (NCDs) such as heart disease, stroke, and diabetes drive up healthcare costs and lower productivity.
- The report identified 13 dietary risk factors, including:
  o High consumption of processed foods and additives.
  o Low intake of whole plant foods and beneficial fatty acids.
  o Excessive intake of red and processed meats.
- The FAO used the **"true cost accounting" method,** which considers costs and benefits that are not reflected in market prices, such as environmental damage, social inequalities, and the health consequences of dietary patterns.
- Globally, unhealthy eating habits account for 70% ($8.1 trillion) of total hidden costs in agrifood systems. **India ($1.3 trillion) has the world's third-largest hidden costs in agrifood systems, after China ($1.8 trillion) and the United States ($1.4 trillion).**

Reclassification of FPI to FDI

Context

- The Reserve Bank of India (RBI) has released a new framework for reclassifying foreign

portfolio investors (FPIs) as foreign direct investment (FDI).

FDI and FPI

- FDI is the investment of more than 10% of a business in another country. It involves **setting up manufacturing facilities, acquiring significant ownership, or forming subsidiaries to establish a direct business presence.**
- FPI refers to **investments in financial assets such as stocks, bonds, or securities** traded in a different country. It is limited to less than 10% ownership of a company and mainly deals with short-term financial gain.

New Framework for Reclassifying FPI as FDI

- The RBI mandates that FPIs must obtain:
  o Government approvals.
  o Consent from the investee company.
- An FPI's equity investment in an Indian company **must be less than 10%** of its total paid-up equity capital. If this limit is exceeded, the **FPI must sell or reclassify the excess holdings as FDI within five trading days of the trade settlement.**
- FPIs cannot reclassify holdings in sectors where FDI is prohibited.

Global Hunger Trends

Context

- According to a Food and Agriculture Organization (FAO) report, the number of hungry people increased in 2023 relative to 2019 pre-pandemic levels.

Food and Agriculture Organization (FAO)

- It is a **United Nations specialized agency** responsible for global hunger relief and nutrition improvement.
- It aims to achieve universal food security through improved agriculture, forestry, fisheries, and land and water resource management.
- It was established on October 16, 1945, and the day is observed annually as World Food Day.
- It has 195 members, and its headquarters is in Rome, Italy.

Highlights of the Report

- Hunger affected 152 million more people in 2023 than before the pandemic in 2019.
- **9.1% of the global population was hungry in 2023**, up from 7.5% in 2019.
- The Sustainable Development Goal (SDG) 2 aims to eliminate hunger by 2030. Rising global hunger levels make meeting this target in six years challenging.
- **Africa had the highest rate of under nutrition**, followed by Asia.
- **Global food production has increased by 56% since 2000.** However, hunger continues due to issues such as access, affordability, and inequality, rather than a lack of food production.
- Obesity levels are rising, especially in high-income areas. **More than 25% of adults in the Americas, Europe, and Oceania are affected.**

Net Borrowing Ceiling

Context

- The Union Net Borrowing Ceiling (NBC) on State borrowing.

About Net Borrowing Ceiling (NBC)

- The NBC is a **fiscal measure enacted by the Union government to limit states' annual borrowing capacity.**
- According to the recommendations of the Fifteenth Finance Commission, the NBC for 2023–2024 is 3% of the estimated Gross State Domestic Product (GSDP) for each state.
- The Union Government limited Kerala's market borrowing to 3% of its GSDP in 2023-24 under the NBC. This limit now applies to all borrowing sources, including open market loans, loans from financial institutions, and state public account liabilities.

> The Fiscal Responsibility and Budget Management (FRBM) Act 2003 establishes fiscal discipline targets to reduce budget deficits and revenue shortfalls. Requires both the Centre and states to maintain a fiscal deficit below 3% of GDP.

State Borrowing

- **Article 293 of the Constitution allows states to borrow within India**, backed by their Consolidated Fund.
- Parliament and state legislatures can enact laws to limit state borrowing.
- If a state has outstanding loans guaranteed by the Centre, the **central government has the authority to impose conditions.**

Dedicated Freight Corridors (DFCs)

Context

- Dedicated freight corridors are increasing India's GDP and revenue for the Indian Railways, according to a recent study from the University of New South Wales, Australia.

About Dedicated Freight Corridors (DFCs)

- Dedicated Freight Corridors are **railway routes designed for freight transportation.**
- It was **announced in the Railway Budget for FY 2005-06.**
  - The Eastern Dedicated Freight Corridor (EDFC) from Sonnagar (Bihar) to Sahnewal (Punjab).
  - The Western Dedicated Freight Corridor (WDFC) stretches from Mumbai's Jawaharlal Nehru Port Terminal to Dadri, Uttar Pradesh.
- The **EDFC is now fully operational**, supporting coal mines and thermal power plants. The WDFC is expected to be fully operational by December 2025.
- The Dedicated Freight Corridor Corporation of India Limited (DFCCIL), a Special Purpose Vehicle (SPV) was founded in 2006 to build, operate, and maintain DFCs.

Findings of the Australian University study on DFCs

- DFCs helped Indian Railways to grow its revenue by 2.94% between fiscal years 2018-19 and 2022-23.
- Freight costs and travel times have decreased, resulting in a 0.5% drop in commodity prices.

Palm Oil in India

Context

- Palm oil imports in India increased by 59% in October 2024.

About Palm Oil

- The oil palm tree is **mainly grown in tropical regions**. It is **derived from the fruits of the African oil palm (***Elaeis guineensis***).**
- It is divided into two types: **Crude palm oil (derived from fruit pulp)** is used for cooking and **Palm kernel oil (extracted from seed)** is used in non-food applications. Both oils are colourless, odourless, and tasteless.
- It is the **highest oil-yielding plant,** it produces nearly five times more than traditional oilseeds, making it an extremely efficient source of edible oil.
- It has a wide range of applications, including packaged foods, cosmetics, detergents, soap, pharmaceutical and biofuel manufacturing.
- India imports palm oil mainly from **Indonesia (57% of global production), Malaysia (26% of global production),** and Thailand.
- **Andhra Pradesh (83.5%)** and Telangana account for about 97% of India's crude palm oil production.

Consumer Price Index (CPI) and Index of Industrial Production (IIP)

Context

- The Ministry of Statistics and Programme Implementation (MoSPI) has announced a new timing for the release of the Consumer Price Index (CPI) and the Index of Industrial Production (IIP) data. Previously released at 5:30 p.m. on the 12th of each month, now released at 4 p.m.

About Consumer Price Index (CPI)

- It tracks changes in the retail prices of goods and services. There are four types of CPI in India:
  - CPI for Industrial Workers (IW)
  - CPI for agricultural laborers (AL)
  - CPI for Rural Workers (RL)
  - CPI (rural/urban/combined)

- The **Labour Bureau of the Ministry of Labour and Employment compiles the first three CPI forms (IW, AL, and RL).** The National Statistical Office (NSO) under the Ministry of Statistics and Programme Implementation compiles the CPI (Rural/Urban/Combined), which is released every month.
- The **base year for CPI calculations is 2012.** However, the Ministry of Labour and Employment has announced a new series of CPI for Industrial Workers (CPI-IW), with 2016 as the base year.

About Index of Industrial Production (IIP)

- It is an index that examines the growth rates of various industries such as manufacturing, mining, and energy over a specific period.
- IIP data is **analyzed and released monthly by the Central Statistical Organization (CSO).**
- In 2017, the **base year of the IIP was updated from 2004-05 to 2011-12.**
- The IIP includes eight core industries: electricity, steel, refinery products, crude oil, coal, natural gas, cement, and fertilizers. These industries represent 40.27% of the IIP.
- The **Office of the Economic Adviser (OEA) of the Ministry of Commerce and Industry publishes the Index of Eight Core Industries (ICI).**

Asset Recovery Interagency Network-Asia Pacific (ARIN-AP)

Context

- India is elected to the Steering Committee of the Asset Recovery Interagency Network-Asia Pacific (ARIN-AP).

About Asset Recovery Interagency Network-Asia Pacific (ARIN-AP)

- It is an **informal collaboration of experts and practitioners**, officially launched in 2013, at its inaugural meeting in Seoul, South Korea.
- It aims to track down and seize criminal assets across Asia-Pacific borders. It focuses on **combating cross-border financial crimes** such as money laundering, corruption, and asset recovery.

- It has 28 member countries and nine observer organizations. Its Secretariat is located in South Korea.
- It encourages easy communication and data sharing among its members via contact points, which enables agencies to track assets informally, without the need for formal legal agreements.
- **India will assume the presidency of ARIN-AP in 2026** and also host the Annual General Meeting (AGM) in 2026.

WIPO 2024 Report

Context

- The World Intellectual Property Organization (WIPO) has released the World Intellectual Property Indicators (WIPI) 2024.

About World Intellectual Property Organization (WIPO)

- It is a **specialized United Nations (UN) agency** dedicated to promoting and safeguarding intellectual property (IP) rights globally.
- It began operations in 1970, when the 1967 World Intellectual Property Organization Convention went into effect.
- It has 193 member states and the **headquarters is in Geneva, Switzerland.**

> ARIN-AP is a member of the Global CARIN (Camden Assets Recovery Inter-Agency Network), a framework that includes more than 100 nations worldwide.

About World Intellectual Property Indicators (WIPI) 2024

- India ranks among the top ten countries for all three major intellectual property rights: patents, trademarks, and industrial design.
- In 2023, a record 3.55 million patent applications were filed globally, representing a 2.7% increase over 2022.
- Residents of China, the United States, Japan, South Korea, and India contributed the most to the global increase in patent filings.

Performance of India

Patents

- India saw a 15.7% increase in patent applications, ranking as the fastest-growing country among the top 20 patent-filing nations.
- With 64,480 patent applications in 2023, it ranks sixth globally, **residents accounted for 55.2% of the total applications.**
- India granted 149.4% more patents in 2023 compared to 2022.
- The **patent-to-GDP ratio increased from 144 to 381.**

Trademark

- Trademark filings in India increased by 60% between 2018 and 2023.
- India saw a 6.1% increase in trademark filings in 2023, placing it fourth globally.
- India has the world's second-largest number of active trademark registrations, with over 3.2 million in force. The top three sectors were health (21.9%), agriculture (15.3%), and apparel (12.8%).
- In 2023, residents filed nearly 90% of all Indian trademarks.

Bran

Context

- According to a new study, removing the bran from millets lowers their protein, dietary fiber, fat, mineral, and phytate content and increases carbohydrate and amylose levels.

About Bran

What is wheat bran

Derived from the outer layer of wheat. Wheat bran is an excellent natural source of Insoluble Dietary Fibre. Bagrry's Wheat Bran is extracted from the best quality wheat grains using our innovative milling technology.
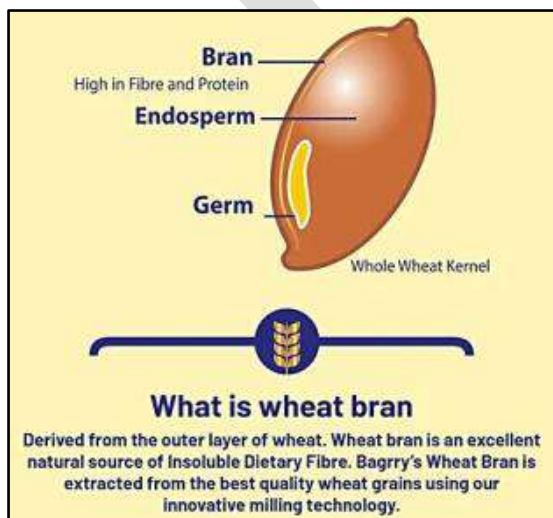
- Bran is the **edible broken seed coat or protective outer layer of cereal grains** like wheat, millets, and rye.
- In flour processing, bran is separated from grains using a process known as sifting or bolting, which is mainly done in a rotating, meshed, cylindrical frame.

Nutritional Content of Bran

- **Bran is rich in dietary fiber and bioactive substances,** including phenolic compounds, which contribute to human health.
- When bran is removed:
  o Protein, dietary fiber, fat, minerals, and phytate content decrease.
  o Carbohydrate and amylose levels increase.

Intellectual Property Rights over Navara Rice

Context

- The Protection of Plant Varieties and Farmers' Rights (PPV & FR) Authority has rescheduled the hearing in a farmer's intellectual property rights case involving Navara rice.

About Navara Rice

- It is a **medicinal rice variety that is high in fats, proteins, and carbohydrates**, and it is also known as "gold" due to its numerous health benefits.
- It is **endemic to the Palakkad (Palghat) district of Kerala**, and was granted Geographic Indication (GI) status in 2007.
- It is a unique grain plant in the **Oryza group, a grass-related plant family that includes all rice varieties.**

About The Protection of Plant Varieties and Farmers' Rights Act 2001

- Breeders have exclusive rights to produce, sell, market, distribute, import, and export the protected variety. They can also appoint agents or licensees and file civil suits if their rights are violated.
- **Researchers may use any registered variety** under the Act for experiments or research for

developing new varieties. **However, they must first obtain permission from the registered breeder.**

- The Department of Agriculture, Cooperation, and Farmers Welfare is responsible for implementing the provisions of the Act.

Rights of Farmers under the Act

- They have the right to register and protect new varieties that they have developed.
- They can save, use, sow, re-sow, exchange, share, or sell their farm produce, including protected variety seeds.
- They are entitled to compensation for the non-performance of a variety under Section 39(2) of the Act.
- They are **not required to pay any fees in cases brought before the Authority, Registrar, Tribunal, or High Court under the Act.**

National Small Savings Fund (NSSF)

Context

- The Delhi government plans to borrow Rs 10,000 crore from the National Small Savings Fund (NSSF) in fiscal year 2024-25.

About the National Small Savings Fund (NSSF)

- It is a fund that collects money from several government-backed small savings schemes.
- It was **established in 1999 as part of the Public Accounts** and is **managed by the Ministry of Finance** under the National Small Savings Fund (Custody and Investment) Rules, 2001, based on Article 283(1) of the Constitution.
- **Key features**
  - These schemes provide higher returns than bank fixed deposits.
  - They include sovereign guarantees and tax breaks.
  - Interest rates on small savings schemes are revised quarterly.
- Loans from the NSSF are more expensive than market borrowings.

It can be grouped into three main categories

- **Post Office Deposits:** Includes Post Office Savings Accounts, Time Deposits (1, 2, 3, and 5 years), Recurring Deposits, and Monthly Accounts.
- **Savings Certificates:** Includes the National Savings Certificate (NSC) and the Kisan Vikas Patra (KVP).
- **Social Security Schemes:** Includes the Public Provident Fund (PPF), Senior Citizens Savings Scheme, and Sukanya Samriddhi Account.

Advertising Standards Council of India (ASCI)

Context

- The Advertising Standards Council of India (ASCI) has released its "Half-Yearly Complaints Report 2024-25".

About Advertising Standards Council of India (ASCI)

- It is **registered as a non-profit organization** under Section 25 of the Companies Act 1956.
- It was established in 1985 as a voluntary self-regulatory organization for the advertising industry to ensure that advertisements follow its Code of Self-Regulation and protect consumer interests.
- In 2006, the Ministry of Information and Broadcasting mandated that all Indian television advertisements conform to ASCI standards.

Highlights of the Half-Yearly Complaints Report 2024-25

Small Savings Schemes

Public Provident Fund (PPF)
Sukanya Smridddhi Yojana (SSY)
Employee Provident Fund (EPF)
Kisan Vikas Patra (KVP)
Senior Citizen Savings Scheme (SCSS)
National Saving Certificate (NSC)

- The **real estate sector had the highest number of advertising violations**, accounting for 34% of the ads examined by ASCI.
- In 59% of cases, advertisers responded quickly by either changing their ads to include the missing information or withdrawing them entirely.
- The Home Care sector experienced the most violations related to green claims, with many products falsely claiming to be eco-friendly without proper supporting documentation.

Coffee Industry in India

Context

- The Coffee Board of India has announced a 10-year plan to double coffee production and exports by 2034.

Coffee Cultivation

- It requires a hot, humid climate with **temperatures between 15°C- 28°C, rainfall between 150 and 250 cm.**
- The ideal soil is well-drained loamy soil with high humus content and minerals such as iron and calcium.
- Coffee plants grow under shady trees to protect them from direct sunlight.
- **Brazil is the world's largest coffee producer,** accounting for nearly 40% of total coffee supply.

Coffee Production in India

- India mainly produces Arabica and Robusta coffees, with **Robusta making up 72% of total production.**
- India became the world's eighth-largest coffee grower in the 2022-2023 period.
- **Karnataka is the largest coffee producer** in India, accounting for about 71% of total coffee production.

Animal Husbandry Statistics 2024

Context

- The Department of Animal Husbandry and Dairying published the report "Basic Animal Husbandry Statistics - 2024."

Key Highlights of the Report

Milk Production

- India is the largest milk producer, accounting for about **25% of global production.**
- **Uttar Pradesh** produced 16.21% of total milk production in India, followed by Rajasthan (14.51%), Madhya Pradesh (8.91%), and Gujarat (7.65%).

> **Coffee Board of India**
> It is an autonomous organization managed by the Ministry of Commerce and Industry. It was created by a Parliamentary Act in 1942. The headquarters is in Bangalore.

Egg Production

- India is the **world's second-biggest egg producer.**
- **Andhra Pradesh** is the largest egg producer, accounting for 17.85% of total output, followed by Tamil Nadu (15.64%), Telangana (12.88%), and West Bengal (11.37%).

Meat Production

- In 2023-24, **poultry accounted for 48.96% of total meat production**, followed by buffalo (18.09%), sheep (11.13%), goat (15.50%), and pig meat (3.72%).
- **West Bengal is the leading meat producer,** accounting for 12.62% of total output, followed by Uttar Pradesh, Maharashtra, Telangana, and Andhra Pradesh.
- In 2023-24, Assam had the highest annual growth rate in meat production, followed by Uttarakhand and Chhattisgarh.

Wool Production

- **Rajasthan produces 47.53% of wool in India**, followed by Jammu and Kashmir (23.06%).

Enhancing Domestic Availability to Reduce the import if Coking Coal

Context

- A Niti Aayog report titled 'Enhancing Domestic Coking Coal Availability to Reduce the Import of Coking Coal' recommended that the government should add coking coal to the list of critical minerals and provide an

exemption to increase domestic production of the key raw material for steel production.

About Critical Minerals

- Critical minerals are essential components of several strategic value chains, including clean technologies, information and communication technologies (such as semiconductors), and advanced manufacturing inputs and materials.
- The **Ministry of Mines identified 30 critical minerals.**

About Coking Coal

- Coking coal, also called metallurgical coal, is a **type of bituminous coal.** It has **higher carbon content, less ash, and less moisture than thermal coal**, which is used to generate electricity. It is a valuable raw material for steel production.
- It is used to produce metallurgical coke through high-temperature carbonisation. This coke is **essential in steelmaking because it is used in blast furnaces to produce pig iron.**
- India depends heavily on imports, with **foreign shipments covering 85% of demand.**
- The largest producers of coking coal globally are: **China (62%), Australia (15%),** Russia (9%), USA (5%).

3.4   SNIPPETS

Topics	Details
International Cooperative Alliance (ICA)	- India hosted the International Cooperative Alliance's (ICA) Global Cooperative Conference for the first time under the theme 'Cooperatives Build Prosperity for All'. - The International Cooperative Alliance (ICA) is an international non-profit organization that supports, unites, and represents cooperatives all over the world. - It was **founded in 1895** and currently has over 306 member organizations from 105 countries around the world. - It is **headquartered in Brussels, Belgium**, and operates four regional offices in Africa, the Americas, Asia-Pacific, and Europe. - It operates in a wide range of industries, including banking, consumer retail, industry and services, agriculture, fisheries, health care, housing, and insurance.
CAFE Norms	- The Centre has imposed a Rs 7,300 crore penalty on eight automakers for violating CAFE norms in FY 22-23. - The Government **adopted the Corporate Average Fuel Efficiency (CAFÉ) norms in 2017 under the Energy Conservation Act, 2001**, to reduce fuel consumption and CO_2 emissions in passenger vehicles. - CAFÉ regulations apply to vehicles weighing less than 3,500 kg, including those powered by diesel, LPG, CNG, hybrids, and electric vehicles. - Penalties for noncompliance with CAFÉ standards; Rs 25,000 per vehicle for minor deviations. Rs 50,000 per vehicle for major noncompliance.
Network Readiness Index 2024	- India ranked 49th on the Network Readiness Index (NRI) 2024. - NRI 2024 ranks 133 economies, which represents 95% of global GDP. - It was published by the Portulans Institute.. - It evaluates economies using 54 variables across four pillars: technology, people, governance, and impact.

	• The top 3 countries are: United States of America, Singapore, Finland • **India ranked second in the lower-middle income group, behind only Vietnam.**
CENVAT	• The Supreme Court ruled that telecom companies can claim CENVAT credits for the installation of mobile towers. • CENVAT (Central Value Added Tax) was **implemented in 2004 as an update to the earlier MODVAT (Modified Value Added Tax).** • CENVAT Credit is the compensation or credit **available to manufacturers for excise duties paid on inputs** such as raw materials or components used in manufacturing. This c**redit can be used to compensate for the final tax liability for finished goods.** • Manufacturers only claim CENVAT credit for items classified as "inputs" under the CENVAT Credit Rules.
Billionaire Wealth Tax	• Brazil proposed a 2% annual wealth tax on ultra-high-net-worth individuals during the G20 summit. • The main objectives are to **raise funds to address global inequality, combat climate change, and alleviate poverty.** • Gabriel Zucman, a French economist, developed the plan. • It expects to generate $250 billion per year by taxing roughly 2,800 billionaires with a combined net worth of $13.5 trillion.

End Logjam For EPFO Pensioners	• The successful pilot run of the Centralised Pension Payments System (CPPS) under the Employees' Pension Scheme (EPS) has improved pension disbursement.
	• **Centralized Pension Payments System (CPPS)** is a new system established under the Employees' Pension Scheme in 1995 to streamline pension payments.
	    o It enables pensioners to collect pensions from any bank branch in India and eliminates the need for bank verification at the time of pension start.
	    o It will come into effect across the country on January 1, 2025.
	• The EPFO regulates and manages provident funds, including the mandatory fund, a basic pension scheme, and an employee disability/death insurance scheme. It works **under the Ministry of Labour and Employment.**

Wind Energy in India	• Tamil Nadu has launched the policy to revitalize and extend the operational lives of aging wind turbines. • India has the **fourth-largest installed wind power capacity in the world.** • According to the National Institute of Wind Energy (NIWE), India's wind energy potential is 1,163.86 GW at 150 meters above ground level. • As of September 2024, **India's installed wind energy capacity was around 47 GW,** contributing to the total renewable energy capacity of 202 GW (including large hydro). • Gujarat, Tamil Nadu, Karnataka, Maharashtra, Rajasthan, and Andhra Pradesh have the highest wind energy potential. These six states account for more than 93% of India's total wind energy capacity.

Domestic Systemically Important Banks (D-SIBs)	• The RBI has designated the State Bank of India (SBI), HDFC Bank, and ICICI Bank as D-SIBs. • **D-SIBs are classified as "Too Big to Fail"** as their operations are so essential that failure may threaten the country's financial stability. • The RBI has been publishing an annual list of D-SIBs since 2015. • The **RBI selects D-SIBs based on their size, taking into account banks with assets greater than 2% of the country's GDP.** • The Financial Stability Board (FSB) designates Global Systemically Important Banks (G-SIBs) based on their size, cross-jurisdictional activities, and interconnectedness. **India has no G-SIBs**.
Digital Life Certificates (DLCS)	• Every November, government retirees must submit a "life certificate" to continue receiving their pensions for an additional year. • Jeevan Pramaan is a Digital Life Certificate (DLC) system **launched in 2014 to allow pensioners to submit their life certificates online.** • The system was developed and is **managed by the National Informatics Centre (NIC), Ministry of Electronics and Information Technology.** • Jeevan Pramaan creates a life certificate with Aadhaar-based biometric authentication. • It eliminates the need for pensioners to physically visit banks or post offices to submit life certificates. Pensioners who prefer to submit their life certificates physically can continue to do so.
Capital Restructuring Norms For CPSES	• The Department of Investment and Capital Asset Management (DIPAM) new guidelines require Central Public Sector Enterprises (CPSEs) to pay annual dividends. • The previous 2016 guidelines required CPSEs to pay either 30% of profit after tax (PAT) or 5% of net worth, whichever was higher. The revised guidelines require a **minimum of 30% of net profit or 4% of net worth, whichever is greater.** • Section 8 of the Companies Act forbids public sector banks, public sector insurance companies, and corporate bodies from distributing profits to their shareholders, so the revised guidelines do not apply to them. • In 2016, the Department of Disinvestment was renamed to the Department of Investment and Public Asset Management. It **works under the Ministry of Finance.**
Engineering Export Promotion Council (EEPC)	• The Union Minister of Commerce and Industry launched the 70th anniversary celebrations of EEPC. • It is **sponsored by the Ministry of Commerce and Industry** to promote trade and investment in India's engineering sector. • It was established in 1955. It has over 12,000 members, with Small and Medium Enterprises (SMEs) making up 60% of the total. • It publishes reports and studies on international trends and opportunities, and releases **monthly magazine "ie2".**
Food Corporation Of India (FCI)	• The Union Government invested Rs 10,700 crore to improve the financial position of the Food Corporation of India (FCI). • The FCI is a **statutory body within the Ministry of Consumer Affairs,**

	Food, and Public Distribution. • It was **established in 1965 under the Food Corporation Act (1964)** to implement the National Food Policy and ensure food security by procuring, storing, and distributing food grains. • It **procures wheat and rice at Minimum Support Prices (MSPs) to maintain buffer stocks,** and distributes food grains to states at Central Issue Prices (CIPs) under public welfare schemes such as the Public Distribution System (PDS) and the Mid-Day Meal Scheme.
Pastoral Census	• India to measure its pastoral cattle and identify pastoral communities for the first time in the 21st Livestock Census. • The livestock census is conducted every five years in both rural and urban areas. The First Census was held in 1919. • The 21st livestock census will take place between October 2024 and February 2025 under the Union Minister for Fisheries, Animal Husbandry, and Dairy. • It will count 16 key animal species, including cattle, buffalo, Mithun, yak, sheep, goat, pig, camel, horse, ponies, mule, donkey, dog, rabbit, and elephant.
RBI Brings Back 102 Tonnes of Gold	• The Reserve Bank of India (RBI) transferred 102 tonnes of gold reserves from the Bank of England for storage in domestic facilities. • As of September 2024, the **RBI held 855 tonnes of gold in reserves,** with 510.46 tonnes stored domestically. • **Gold made up 9.3% of India's total foreign reserves** as of September 2024. • The Indian government currently holds 324 tonnes of gold at the Bank of England and the Bank for International Settlements. • Countries prefer to store gold domestically to avoid potential foreign sanctions or actions that could freeze or restrict access to assets held abroad.
National Company Law Tribunal (NCLT)	• The Supreme Court highlighted the shortage of members in the National Company Law Tribunal (NCLT). • The **NCLT was established in 2016** under Section 408 of the Companies Act 2013, **on the recommendation of the V. Balakrishna Eradi Committee on Company Insolvency and Winding-Up Law.** • It provides a specialized forum for resolving company law and Insolvency and Bankruptcy Code (IBC)-related disputes, upholds corporate governance, and protects shareholders' interests. • It operates through 16 benches across India, and is supported by 16 judicial and 9 technical members. • It **functions under the Ministry of Corporate Affairs (MCA).**

3.5   ADDITIONAL TOPICS FOR READING FROM IASGYAN WEBSITE

TOPIC NAME	UPLOADED ON IAS GYAN WEBSITE ON
India's Cities, Expanding Hubs Of Precarious Employment	9th November
Public Distribution System (Pds)	12th November
Care Economy	12th November
India Tea And Sugar Exports	15th November
Fossil Fuel Subsidies	19th November
Natural Farming In India	19th November
State Of Aquaculture In India	22nd November
National Milk Day And White Revolution	28th November

4. DEFENSE & SECURITY

4.1 ANTI-TERROR CONFERENCE

Context

- The home minister releases SoP for UAPA investigations, promises a new National Counter Terrorism Policy and Strategy, and combating terror involves legally empowering agencies fighting it.

About Anti-terror Conference 2024

- **Preventing Terror Group Formation:** Focus on dismantling new groups like Hizb-ut-Tahrir (HuT) and addressing terror funding via organized crime in northeast India.
- **Case Studies:** Insights from the Rameshwaram cafe blast and advanced cross-border trafficking tactics using drones.
- **Enhanced Coordination:** Strengthening anti-terror structures and district-level police collaboration to counter Left Wing Extremism and terror financing.
- **Technological Challenges:** Addressing the misuse of social media, VPNs, encrypted apps, and narcotics trafficking impacting national security.
- **National Databases:** Leveraging the NIA's comprehensive terror database for effective investigation and counter-terrorism efforts.

What is Organised Crime?

- Organized crime refers to a category of **transnational, national, or local group of centralized enterprises run to engage in illegal activity, most commonly for profit**. It is generally thought of as a form of illegal business, some criminal organizations, such as terrorist groups, rebel forces, and separatists, are politically motivated. In India, organized crime includes activities such as drug trafficking, arms smuggling, human trafficking, extortion, and illegal mining.

Symbiosis between Organized Crime and Terrorism

- **The analysis focuses on two main dynamics**: terrorist groups engaging in criminal activities to fund their ideological pursuits, and criminal groups employing terrorist tactics for financial gain. Primary criminal activities include drug trafficking, migrant smuggling, and money laundering, while terrorism tactics range from murder and kidnapping to extortion and attacks on civilians and infrastructure.

How does Organised Crime in India Work?

- Organized crime involves groups engaging in ongoing serious crimes for significant profit. These groups have a durable core, surrounded by subordinates, specialists, and transient associates forming an extended, disposable network.

Legal Position in India on Organized Crime

- Organized crime has always existed in India in some form or another. It has, however, assumed its virulent form in modern times due to several socio-economic and political factors and advances in science and technology. Even though rural India is not immune from it, it is essentially an urban phenomenon.

Key Measures and Actions

- **Anti-Human Trafficking Initiatives:** The Ministry Home Affair's Anti-Trafficking Nodal Cell coordinates state actions, while the Ministry of Women and Child Development supports victims through **Ujjawala and Swadhar programs**.
- **Anti-Drug Trafficking Measures:** Statutes like the **NDPS Act (1985)** and international conventions strengthen drug control. **Operations like Dhvast (2023) target**

trafficking nexuses, with India supporting UNODC efforts.

- **Trafficking of Persons Bill (2021)**: Proposes multi-level investigation and rehabilitation bodies and Anti-Trafficking Units for victim rescue and case management.

Implementational Challenges:

- India lacks a specific national law and a coordinating agency to combat organized crime effectively. **Existing laws are inadequate, and hierarchical structures make gathering evidence difficult**. Political differences and resource constraints further hinder coordinated efforts between central and state agencies.

Suggestions

For the eradication of this problem following suggestions are given:

- As organized crime has become an **international problem,** therefore, it is necessary to raise the issue at the international level.
- The **police and other investigating agencies** must be properly trained to deal with this crime.
- There should be a ban on these offenders to contest any election be it of **parliament, state assembly, panchayat, etc.**

Conclusion

- Although there is no specific law at the national level to deal with organized crimes, there are general laws that deal with organized crimes and some states have enacted specific laws to eradicate this evil.

4.2 INSURGENCY IN ASSAM

Context

- The Centre extended the ban on the United Liberation Front of Asom (ULFA) for five years, citing continued involvement in criminal activities and extortion and pursuing an objective of secession from India.

About United Liberation Front of Asom (ULFA)

- It is a banned militant organization in Assam, seeking an independent Assamese nation through armed struggle. **Designated a terrorist group by India in 1990**, it is listed under **"other groups of concern"** by the U.S. State Department.

Insurgency in Assam

- The **United Liberation Front of Assam (ULFA), formed in 1979**, sought a sovereign Assam through armed struggle. Insurgency persisted in Assam despite carving out **Nagaland, Mizoram, Meghalaya, and Arunachal Pradesh.** Recently, ULFA lost influence as many middle-rung leaders were arrested.

Factors for the rise of insurgency in Assam

- **Tribal conflicts:** Assam has 15 recognized tribes in Karbi Anglong and North Cachar Hills, 14 in the rest of the state. Major tribes include **Bodo (35%), Mishing (17.52%), Karbi (11.1%), Rabha (7.6%), Sonowal Kachari (6.5%), Lalung (5.2%), Garo (4.2%), Dimasa (3.2%).** Bodo groups led the most sustained autonomy movement.
- **Immigration:** Large-scale immigration of **Bengali-speaking Muslims from Bangladesh** has been a source of tension, with Assamese viewing it as a threat to their identity and economy.
- **Political Factors:** Movements for sub-regional autonomy, such as the Bodo movement for Bodoland in 1987, often clashed with State Governments and Autonomous Councils.

- **Economic Factors:** Economic isolation after partition and perception of resource exploitation by the central government contributed to insurgency in the region.

Government initiatives:

- **Ministry of Development of North Eastern Region (DoNER):** Responsible for planning, execution, and monitoring of development schemes in the North Eastern Region to accelerate socio-economic development.

Inner Line Permit (ILP)

- Restrictions on outsiders' entry in Mizoram, Nagaland, and Arunachal Pradesh to preserve the identity of indigenous people. Outsiders require ILP for entry.

Constitutional Provisions

- **Article 244(1):** Provisions of the 5th Schedule apply to the administration or control of scheduled areas and tribes.

- **Article 244(2):** Provisions of the 6th Schedule apply in Assam, Meghalaya, Tripura, and Mizoram to create Autonomous District Councils.
- **Autonomous Districts:** Autonomous districts like Karbi Anglong, Khasi Hills, and Chakma District created to address demands of ethnic groups.
- **Article 371(A):** Nagaland has been granted special status under Article 371(A).

Way Forward

- Key measures include **strengthening communication, infrastructure, and central-state coordination** for swift insurgency responses. **Promoting cultural interaction, inclusive development, and efficient governance ensures sustainable peace. Fast-tracking justice** and addressing regional aspirations are vital for progress.

4.3   INDIA'S HYPERSONIC MISSILE

Context

- Defence Research and Development Organisation (DRDO) conducted a successful flight-trial of **India's first long-range hypersonic missile** from Dr APJ Abdul Kalam Island off the coast of Odisha.

About Hypersonic Missiles

- **Definition:** Fast, low-flying, and highly maneuverable weapons designed to evade traditional missile defense systems.
- **Trajectory:** Unlike ballistic missiles, they do not follow a predetermined, arched trajectory and can maneuver en route to their destination.
- **Speed: Hypersonic:** Faster than Mach 5 (five times the speed of sound, approximately 6,100 km/h); Supersonic: Between Mach 1 and Mach 5 (approximately 1,220 to 6,100 km/h).

- **Ionization:** At hypersonic speeds, air molecules around the vehicle change, leading to ionization, which subjects the missile to tremendous stresses.
- **Types of Hypersonic Weapons:**
  - **Hypersonic Glide Vehicles (HGV):** Launched from a rocket before gliding to the target.
  - **Hypersonic Cruise Missiles (HCM):** Powered by scramjet engines after acquiring the target.

Advantages:

- **Responsive Strike**: Effective against distant, defended, or time-sensitive threats when other forces are unavailable.
- **Conventional Use:** Rely on kinetic energy, effective against unhardened targets or underground facilities.

- **Detection Challenges:** Fly at lower altitudes than ballistic missiles, complicating tracking by surface-based sensors.

Global Leaders in Hypersonic Tech

- **Russia and China**: Leading in development, with Russia deploying systems like Kinzhal in Ukraine.

United States

- Advancing with programs like the Long-Range Hypersonic Weapon (LRHW).

India tests its first hypersonic missile

- **Genesis:** Builds upon DRDO's Hypersonic Technology Demonstrator Vehicle (HSTDV) program (It is intended to attain autonomous scramjet flight for 20 seconds, using a solid rocket launch booster).
- **Range:** Over 1500 km.
- **Speed:** Mach 6 (Six times the speed of sound).
- **Mid-Flight Maneuverability:** Combines the speed of a ballistic missile with the agility of mid-flight movements like a cruise missile to bypass defenses.

- **Advanced Tracking:** Utilizes advanced multi-domain monitoring systems for precise targeting.
- **Multi-Payload Capability:** Capable of carrying both conventional and nuclear warheads.
- **Applications:** Usable across the Army, Navy, and Air Force. The naval version (under development) is designed to target and destroy enemy warships at long distances.

About Defence Research and Development Organisation (DRDO)

- It is an agency under the Department of **Defence Research and Development in Ministry of Defence** of the Government of India, charged with the military's research and development, **headquartered in Delhi**, India. It was **formed in 1958** by the merger of the Technical Development Establishment and the Directorate of Technical Development and Production of **the Indian Ordnance Factories with the Defence Science Organisation under the administration of Jawaharlal Nehru.**

4.4   MRFA IN INDIA

Context

- The Indian Air Force's (IAF) 114 MRFA requirement was formally announced in April 2018 with a Request for Information (RFI). The Indian Navy also needed new fighter jets.

About Multi-Role Fighter Aircraft (MRFA)

- The Medium Multi-Role Combat Aircraft (MMRCA) competition in India, also known as the **MRCA tender, was to supply the Indian Air Force (IAF)** with 126 multi-role combat aircraft.

Purpose

- The upcoming Multi-Role Fighter Aircraft (MRFA) deal addresses the IAF's pressing needs, picking up where the earlier **Medium**

Multi-Role Combat Aircraft (MMRCA) Project left off before being scrapped in 2015.

Indigenization and Enhanced Fighter Capabilities

- India's goal of strategic independence in the defense sector has been largely dependent on its pursuit of self-reliance for fighter aircraft engines. The **Tejas Light Combat Aircraft (LCA)** and the soon-to-be **Advanced Medium Combat Aircraft (AMCA)** are two examples of how India, one of the few nations in the world, has successfully developed and produced its fighter aircraft.
- However, a long, hard way exists before Indian-made fighter aircraft engines are

developed. India's excessive reliance on foreign suppliers for vital **technologies, primarily aircraft engines,** continues to be a significant barrier to the nation's ambition of becoming self-sufficient, even with a healthy defence establishment.

Need for Atmanirbharta push

- **India must ensure pre-conditions of setting** up facilities for "manufacture in India", even if certain aircraft have to be accepted in fly-away conditions.
- (c) India must insist on the **Transfer of Technology of the engine / co-development** of the engine to get the technology for indigenous development of engines and other technologies.

4.5   NAGA CONFLICT

Context
- The NSCN-IM accuses the government of violating the Framework Agreement's principles, specifically in failing to recognize Nagalim's 'unique history and sovereign identity.'

Naga Insurgency
- The Naga insurgency, India's oldest, is aimed at creating a separate homeland of Nagalim that unites parts of India's mountainous northeast with areas of neighbouring Myanmar for ethnic Naga people. About 20,000 people have died in the conflict since it began in 1947.

Background
- **British Annexation**: Assam was annexed by the British in 1826, and the Naga Hills became part of British India in 1881.
- **Formation of NNC:** The Naga National Council (NNC) was established in April 1946 to promote social and political upliftment of the Nagas.
- **Rise of Naga Independence Movement:** Radical leader Angami ZapuPhizo's return from Burma in 1947 strengthened the NNC faction demanding full independence.

Shillong Accord & Split of NNC
- **Shillong Accord (1975):** An agreement signed between the Government of India and some NNC leaders to abjure violence and seek a solution within the Indian Constitution.
- **Opposition to Accord**: Phizo, Isak Swu, and Thuingaleng Muivah opposed the accord, leading to a split.
- **Formation of NSCN (1980):** Isak Swu and Muivah formed the National Socialist Council of Nagaland (NSCN).
- **NSCN Split (1988):** NSCN split into two factions: NSCN (I-M) led by Isak &Muivah, and NSCN (K) led by Khaplang.

Demand for Greater Nagaland
- NSCN (I-M) initially sought an independent nation including present Nagaland, Naga-inhabited areas of Manipur, and parts of Myanmar.Another demand was to integrate Naga-inhabited districts of Manipur with the state of Nagaland under the Indian Constitution.

About Naga Peace Accord

- The Naga Peace Accord is a peace treaty, signed, on 3 August 2015, between the Government of India, and the National Socialist Council of Nagaland (NSCN), to end the insurgency in the state of Nagaland in Northeast India.
- The Naga peace talks refer to talks undertaken between the Indian government and the various stakeholders in Nagaland to resolve decades-old disputes. Some of these issues date back to the colonial era.

Historical Background

- **Naga Independence Declared (1947)**: The Naga National Council (NNC) declared Nagaland's independence on August 14, 1947, led by Angami ZapuPhizo.
- **AFSPA Enacted (1952):** In response to the Naga insurgency, the Indian government deployed the army and enacted the Armed Forces (Special) Powers Act.
- **Shillong Accord (1976):** A peace agreement was signed, but top NNC leaders rejected it, citing lack of sovereignty and forced acceptance of the Indian Constitution.
- **NSCN Formation and Ceasefire (1981-1997):** The NNC split, leading to the formation of the NSCN, which entered into a ceasefire with the Indian government in 1997, initiating peace talks.

2015 Framework Agreement (FA):

- The Framework Agreement was signed by the government and the Naga leaders in 2015, making it a landmark agreement which is likely to pave way for permanent solution to the age-old Naga problem. Signing of the 'Framework Agreement' between GOI and NSCN-IM, on 03 August 2015, is perceived as a step towards restoration of peace in Nagaland in India.

Obstacles to Naga Peace Accord and Framework Agreement of 2015

- Defining of Greater Nagaland, called 'Nagalim'.
- Integration of adjoining Naga inhibited areas.
- Unity amongst all Naga groups, despite the NSCN (IM) being the strongest and the lead group.

- Building up of greater confidence among the Naga groups, the state government and the Centre.

Way Forward
- Engage all factions and insurgent groups, addressing cultural, historical, and territorial concerns for lasting peace.
- Ensure agreements foster social harmony, economic prosperity, and protection for all tribes and citizens.
- Decentralize powers to tribal heads, ensuring minimal centralization for effective governance and development.
- Grant greater autonomy to Naga areas with focused budget allocations for cultural preservation and development needs.

4.6   SHORT ARTICLES

CISF

Context
- The Union Home Ministry has approved the **first all-women battalion of the Central Industrial Security Force (CISF)**, which the Home Minister proposed on the occasion of the 53rd CISF Day function.

About Central Industrial Security Force (CISF)
- It is a **central armed police force in India under the Ministry of Home Affairs**. CISF's primary mission is to provide security to large institutions, be it Governmental or privately owned. It was set up under an **Act of the Parliament of India** on **15 March 1969** with a strength of 2,800.
- **Role:** Among its duties are guarding sensitive governmental buildings, Parliament complex, the Delhi Metro, and providing airport security. It also plays a major **role in Disaster Management**. The CISF has a **'Fire Wing' which helps during fire accidents in Industries where the CISF is on guard**. CISF also provides consultancy services to **private industries as well as other organisations** within the Indian government.
- **Structure and organization:** The CISF is headed by an **Indian Police Service officer** with the rank of Director-General, assisted by an IPS officer in the rank of Addl. Director-General.

4.7   SNIPPETS

Topics	Details
Hwasong 19	The Hwasong-19 is North Korea's long-range solid-fuel ICBM designed to deter external threats and showcase military capabilities. At over 28 meters long, it enhances readiness but faces high detection risks due to its size and transport vehicles. It likely lacks MIRVs, with its exact range classified.
Exercise Garuda Shakti	India and Indonesia conducted a joint exercise involving The Parachute Regiment (Special Forces) and Kopassus to enhance interoperability, cooperation, and tactical skills. The exercise focused on special operations, jungle warfare, counter-terrorism, and cultural exchange to strengthen bilateral military ties and shared security objectives.
Exercise Vajra Prahar	Exercise VAJRA PRAHAR 2024, held from November 2–22 at Orchard Combat Training Centre, Idaho, USA, aims to enhance military cooperation and interoperability between India and the US through joint Special Forces operations in desert environments, focusing on tactical drills, joint planning,

	and physical fitness.
Antariksha Abhyas – 2024	India's first space-focused military exercise aims to bolster defense capabilities, assess reliance on space-based assets, and address vulnerabilities in space services. Collaborating with ISRO and DRDO, it seeks to enhance coordination, operational readiness, and innovation in space defense technologies.
Exercise sea vigil	It was conceptualized in 2018 and is a comprehensive coastal defense drill to validate maritime security post-26/11. It involves multiple ministries, agencies, armed forces, and maritime stakeholders, aiming to bolster coastal infrastructure security and raise awareness among coastal communities. It serves as a precursor to the Indian Navy's TROPEX.
ICBM	Russia is developing the 9M730 Burevestnik (NATO: Skyfall), a nuclear-powered cruise missile with global reach, expected to be launch-ready by 2025. Investments include submarines, unmanned underwater craft, and potential targeting of undersea internet cables. Russia's revamped strategy, despite a smaller army, aligns with global threats from Iran, North Korea, and China.
Intermediate-range ballistic missile (IRBM)	It has a range of 3,000–5,500 km, bridging Medium Range and Intercontinental Ballistic Missiles (ICBMs). It evolved from the A4b rocket, an upgrade of Nazi Germany's V-2, and is currently operated by countries like China, India, and Russia. IRBMs are strategic weapons, with some overlap in classification with MRBMs.
Sabal 20	The electric unmanned helicopter is designed for precise aerial logistics with a tandem rotor configuration, capable of carrying up to 20 kg in rugged, confined terrains. It features VTOL, low noise, and advanced autonomous flight for high-altitude, long-distance operations.
K4 missile	It is a type of Submarine-launched ballistic missile (SLBM). It is developed by Defence Research and Development Organisation (DRDO). It has a range of 3,500 km and has solid rocket propellant.
UNICORN Masts	The UNICORN is an advanced integrated antenna system developed by NEC Corporation, Sampa Kogyo K.K., and The Yokohama Rubber Co., Ltd., for Japan's Mogami-class frigates. It consolidates antennas into a single radome, enhancing stealth, reducing electronic signatures, and improving detection range while simplifying maintenance.
Arrow 3	The Arrow system, developed by Israel and the U.S., includes Arrow-2 and Arrow-3 interceptors to counter long-range missile threats. Israel sold the Arrow-3 to Germany in a $3.5 billion deal. It complements Israel's missile defenses, including Iron Dome and David's Sling, with Arrow-3 intercepting missiles before atmospheric re-entry.
High altitude balloons	HABs or stratostats are usually uncrewed balloons typically filled with helium or hydrogen and released into the stratosphere, generally attaining between 18 and 37 km (11 and 23 mi; 59,000 and 121,000 ft) above sea level. The most common type of high-altitude balloons are weather balloons. Other purposes include use as a platform for experiments in the upper atmosphere.
Minuteman III	The Minuteman III is a U.S. land-based intercontinental ballistic missile,

Intercontinental Ballistic Missile	operational since the 1970s, with a range of 13,000 km and speeds up to 15,000 mph. It carries a single nuclear warhead, with 440 missiles deployed in hardened silos. Its replacement, the Ground-Based Strategic Deterrent, is expected by 2029.
VINBAX 2024	It is a joint military exercise between the Indian Army and the Vietnam People's Army that took place in Ambala and Chandimandir. The exercise was the fifth edition of the VINBAX series and was a significant step in strengthening the bilateral relations between the two countries.
'SANYUKT VIMOCHAN 2024'	The Indian Army's 'Sanyukt Vimochan 2024' exercise, conducted by the Konark Corps, focused on enhancing disaster response coordination. Held in Ahmedabad and Porbandar, it featured a tabletop exercise and a multi-agency demonstration with participation from Indian and international agencies. It aimed at improving interagency integration for swift disaster relief.
Bharat NCX 2024	This landmark initiative, led by the National Security Council Secretariat and Rashtriya Raksha University, strengthens India's cybersecurity resilience. It unites over 300 participants from government, public, and private sectors for training, Live Fire, and strategic exercises. The event also contributes to global discussions on Humanitarian Assistance and Disaster Relief.
Exercise Austrahind	It is an annual event conducted alternatively in India and Australia. The Indian contingent comprising 140 personnel will be represented mainly by a battalion of the DOGRA Regiment and 14 personnel from the Indian Air Force.
Poorvi Prahar	Ex Poorvi Prahar enhances the Indian Armed Forces' combat effectiveness through integrated joint operations in challenging mountainous terrain. It showcases advanced military technologies like drones and AI-driven analytics for improved coordination and decision-making. The exercise strengthens India's multi-domain operational capabilities and strategic deterrence.

4.8   ADDITIONAL TOPICS FOR READING FROM IASGYAN WEBSITE

TOPIC NAME	UPLOADED ON IAS GYAN WEBSITE ON
Social engineering and malicious APKs	4TH NOV
Big Tech's Fail; Unsafe Online Spaces for women	6TH NOV
Urban Naxalism	8TH NOV
Mahasagar	9TH NOV
Pinaka	12TH NOV
Crisis in Manipur	13TH NOV
Understanding the changing face of extremist violence	27TH NOV
President's colors	30th NOV

5. ENVIRONMENT & ECOLOGY

5.1   KEY TAKEAWAYS OF COP29

Context
- The disappointing deal on climate finance at COP29 could be the beginning of the unraveling of climate talks.

Details
- **Developed nations have pledged to mobilize $300 billion annually** for developing countries by 2035, falling significantly short of the $1 trillion required annually for effective climate action.
- **This commitment, a threefold increase from the current $100 billion**, is insufficient and delayed, despite urgent financial needs for combating climate change.
- **Over the past 15 years, annual climate conferences have consistently underperformed**, failing to align outcomes with the 2015 Paris Agreement's temperature targets.
- **Current global efforts are far from adequate**, with projected **emissions reductions by 2030 estimated at only 2%, instead of the necessary 43% cut from 2019 levels.**

Key takeaways of COP29

Climate Finance
- New Collective Quantified Goal (NCQG): USD 300 billion annually by 2035 for developing countries.
- Scale finance to USD 1.3 trillion annually by 2035 from public and private sources.

Carbon Markets (Article 6)
- Finalized frameworks for **country-to-country carbon credit trading (Article 6.2).**
- **Operationalized Paris Agreement Crediting Mechanism** (Article 6.4) with safeguards for environmental and human rights.

- **Supported capacity-building for least developed countries (LDCs)** to participate in carbon markets.

Transparency
- **13 countries submitted Biennial Transparency Reports (BTRs)** under the Enhanced Transparency Framework.
- UNFCCC organized #Together4Transparency with 42 events to promote transparency.

Adaptation
- Launched Baku Adaptation Roadmap for expedited **National Adaptation Plans (NAPs).**
- Established a support program for NAP implementation in LDCs.
- High-level dialogues emphasized financing and technical support for adaptation.

Indigenous Peoples and Local Communities
- **Adopted Baku Work plan and renewed LCIPP** Facilitative Working Group.

Gender and Climate Change
- **Extended Lima Work Programme on Gender for 10 years**; mandated a new Gender Action Plan by COP30.

Civil Society and Inclusivity
- Over 55,000 attendees from civil **society, Indigenous Peoples, youth, and businesses.**
- **Strengthened Action for Climate Empowerment (ACE)** for public engagement in national policies.

Global Climate Action
- Showcased solutions under the Marrakech Partnership for Global Climate Action.
- Launched 2024 Yearbook of Global Climate Action emphasizing non-Party stakeholder contributions.

Forests and REDD+

- **UK pledged £3 million for REDD+ transparency** and deforestation halts by 2030.

Nationally Determined Contributions (NDCs)

- **Stronger NDCs (3.0) due in 2025 covering all greenhouse gases and sectors.**
- **UK and Brazil pledged stronger** climate action in updated NDCs.

India's Initiatives at COP29

Resilient Infrastructure

- Highlighted CDRI and IRIS initiatives for disaster-resilient infrastructure and SIDS adaptation.

Industrial Decarbonization

- Co-hosted LeadIT Member Meet with Sweden; promoted hydrogen-based solutions and CO2 capture.

SIDS Adaptation Finance

- Advocated finance unlocking and disaster-resilient support for SIDS.

Solar Energy Leadership

- Promoted solar adoption with ISA, targeting a 20-fold increase by 2050.

Gender-Inclusive Action

- Showcased women-led clean energy solutions and gender-inclusive climate policies.

Lead IT Summit

- Reaffirmed commitment to heavy industry decarbonization under the Paris Agreement.

5.2   WMO GHG BULLETIN

Context

- According to World Meteorological Organization's (WMO) annual Greenhouse Gas Bulletin Carbon dioxide is accumulating in the atmosphere faster than at any time experienced during human history, rising by more than 11 percent in just two decades.

About Greenhouse Gas Bulletin

- The Greenhouse Gas Bulletin has been **published annually since 2004**. This publication presents the latest analysis of observations from the **WMO Global Atmosphere Watch (GAW) Programme** on concentrations of long-lived greenhouse gases in the atmosphere for 2023.

Details

- The Bulletin reports globally averaged surface mole fractions of **carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O).** It compares these values to those of the previous year and pre-industrial levels. Additionally, it provides insights into changes in radiative forcing — the **warming effect on the atmosphere** by long-lived greenhouse gases and details the contribution of individual gases to this effect.
- The Greenhouse Gas Bulletin is released yearly to inform the **United Nations Climate Change negotiations, the annual Conference of the Parties (COP).**

Key highlights of the Bulletin

Carbon Dioxide (CO₂)

- ~64% of the warming effect
- Fossil fuel combustion, cement production
- Long-term increase primarily due to fossil fuels, with yearly variations influenced by the El Niño. Southern Oscillation (ENSO) impact on natural carbon fluxes.

Methane (CH₄)

- ~16% of the warming effect

- Agriculture (livestock), waste decomposition, natural gas extraction
- Short-lived (remains in atmosphere ~10 years), but highly potent as a greenhouse gas.

Nitrous Oxide (N$_2$O)
- ~6% of the warming effect
- Agricultural practices (fertilizers), industrial processes
- Contributes to ozone depletion in addition to warming, with a long atmospheric lifetime.

Radiative Forcing
- Increased by 51.5% (1990–2023)
- CO$_2$ accounts for ~81% of the increase

- Long-lived greenhouse gases, predominantly CO$_2$
- Radiative forcing measures the influence of greenhouse gases on global temperatures.

About World Meteorological Organization's (WMO)
- The WMO is governed by the World Meteorological Congress, composed of representatives from member states. This congress meets every four years to set policies and priorities for the organisation. The WMO plays a vital role in assessing and communicating the state of the global climate.

5.3   RUBBER PLANTATION IN SE ASIA

Context
- A study published in **Environmental Management,** examined the effect of rainforest conversion into rubber plantations on soil's dissolved organic carbon (DOC).

About Rubber Plantation
- Rubber production is a vital industry in Southeast Asia, mostly in countries like **Thailand, Indonesia, and Malaysia**, which collectively account for the majority of the world's natural rubber production.

The Challenges of Conventional Rubber Production
Deforestation and Habitat Loss
- **Conventional rubber production** involves monoculture plantations that lead to **large-scale deforestation, causing habitat destruction** and loss of biodiversity in tropical rainforests, particularly in Southeast Asia**.**

Agrochemical Pollution
- The **use of pesticides and fertilizers** in rubber cultivation can pollute soil and waterways, leading to further environmental degradation and negatively impacting local ecosystems and water quality.

Social Impact on Smallholder Farmers
- Smallholder farmers, who represent a major portion of the rubber workforce, **face low wages, limited access to**

Case study 1:
A 2023 study published in Nature (Mongabay) found that over 4 million hectares (10 million acres) of forest have been cleared for rubber plantations in Southeast Asia since 1993.

Case study 2:
In South-East Asia, rubber monoculture has taken over **250,000 hectares of natural forest and 61,000 hectares of protected area between 2005 and 2010.** Over half of these plantations are in areas which are susceptible to insufficient water availability and soil erosion. Scientists have also linked rubber monoculture to reduction in **water reserves, soil productivity and biodiversity in South-East Asia**.

healthcare and education, and high vulnerability to price volatility in the **global rubber market, which impacts their economic stability and quality of life.**

The Role of Technology and Innovation

- Technology and innovation also play a significant role in advancing sustainable rubber production. For instance, research is **underway to develop drought-resistant rubber tree varieties** that can thrive in changing climatic conditions, reducing the need for irrigation and water resources. Furthermore, advances in agricultural practices, **such as precision farming techniques and remote sensing technologies, enable farmers to optimize resource use and minimize waste.**

Conclusion

- The transition towards sustainable rubber production in Southeast Asia represents a significant step towards building a more environmentally resilient and socially equitable future.
- By embracing practices such as **agroforestry, organic farming, and technological innovation**, the rubber industry can minimize its environmental footprint, protect biodiversity, and improve the livelihoods of millions of smallholder farmers across the region.

5.4 CARBON CREDIT TRADE

Context

- The global carbon market gets a green signal at COP29 under the Paris Agreement's Article 6.

What is Carbon credit trade?

- **Carbon credits are permits that allow the owner** to emit a certain amount of carbon dioxide or other greenhouse gases (GHGs). **One credit allows the emission of one ton of carbon dioxide** or the equivalent of other greenhouse gases. Carbon credits are also known as carbon allowances.
- The ultimate goal of the carbon credit system is to reduce the emission of GHGs into the atmosphere.

How Do Carbon Credits Work?

- The **United Nations allows countries** a certain number of credits, and each nation is responsible for issuing, monitoring, and reporting its carbon credit **status annually**. Governments allow companies to emit a set amount of GHGs before needing to purchase credits.

About Article 6 of the Paris Agreement:

- **Purpose of Article 6:** Provides principles for voluntary cooperation among countries to meet climate targets. Allows the transfer of carbon credits earned from reducing greenhouse gas emissions.
- **Sub-sections:** Article 6 comprises two sub-sections: Article 6.2 and Article 6.4.
- **Article 6.2:** Allows countries to trade emission reductions/removals through bilateral or multilateral agreements. Traded credits are called Internationally Transferred Mitigation Outcomes (ITMOs), measured in CO_2 equivalent (CO_2e) or other metrics.
- **Article 6.4 (Paris Agreement Crediting Mechanism):** Aims to create a global carbon market overseen by a UN body called the Article 6.4 Supervisory Body (6.4SB). Credits under this mechanism are called A6.4ERs and can be bought by countries, companies, or individuals.
- **Current Status:** The agreed standards were proposed at the meeting of the Supervisory Body for Article 6.4 held in Baku last month.

About Credit and Offset

Credits	Offsets
Measurement unit to "cap" emissions (permissible emissions).	Measurement unit to "compensate" for emissions by investing in green projects.
Generated through carbon reduction projects.	Generated through investments in green projects (nature-based or technological).
Can be traded on carbon markets.	Can be monetized on carbon markets.
Can come from nature-based (e.g., reforestation) or mechanical (e.g., renewable energy) solutions.	Can be generated from nature-based initiatives (e.g., reforestation, wetland rejuvenation) or mechanical solutions (e.g., renewable energy, direct carbon capture technologies).
Used to cap or reduce total emissions to a specific limit.	Used to compensate for emissions by removing or reducing them elsewhere.

5.5 COUNTRIES' CLIMATE CONTRIBUTIONS

Context
- Argentina has left UN climate talks and US President-elect Donald Trump plans to withdraw from the Paris climate agreement.

Facts
- **Global Carbon Dioxide Emissions (1850–2040):** CO_2 emissions have risen rapidly in the past 70 years. They are projected to remain steady but at high levels in the coming decades. Emission reductions in developed economies are expected to offset growth in developing countries.
- **Top CO2 Emitters:** The largest absolute emitters include China, the United States, and European Union nations.
- The highest per capita emissions are observed in the United States and Russia.
- **Greenhouse Gas Emissions (Other Gases):** Methane, nitrous oxide, and fluorinated gases are projected to increase by 30% over the next three decades.
- **Primary Sources of Global GHG Emissions (2013):** Electricity and heat contribute 31%, transportation 15%, agriculture 11%, manufacturing 12%, and forestry 6%. Energy production of all types accounts for 72% of total emissions.
- **Per Capita Greenhouse Gas Emissions (2018):** The highest per capita greenhouse gas

emissions are observed in the United States and Russia.
- **Sources for Emission Data:** Carbon Dioxide Information Analysis Center (Oak Ridge National Laboratory, 2017), World Energy Outlook (International Energy Agency, 2020, 2021), Global Non-CO2 Emission Projections (U.S. Environmental Protection Agency, 2019), Climate Analysis Indicators Tool (World Resources Institute, 2017)

What are the NDCs?
- Nationally Determined Contributions, or NDCs, are national climate action plans by each country under the Paris Agreement. The Paris Agreement requires that NDCs are updated every five years with increasingly higher ambition, taking into consideration each country's capacity.

The Paris Agreement and NDCs
- **Definition of NDCs:** Nationally Determined Contributions (NDCs) are efforts by each country to reduce national emissions and adapt to climate change impacts.
- **Role in the Paris Agreement:** NDCs are central to achieving the long-term goals of the Paris Agreement, which include global peaking of GHG emissions and rapid reductions thereafter.

- **Objective:** To achieve a balance between anthropogenic emissions and removals of GHGs by the second half of the century. Emission reductions should be based on equity, sustainable development, and efforts to eradicate poverty, especially in developing countries.
- **Emissions Peaking:** The peaking of emissions is expected to take longer for developing countries. Efforts should be undertaken in the context of their development priorities.

- **Submission of NDCs:** NDCs are submitted every five years to the UNFCCC secretariat. Successive NDCs should represent a progression compared to the previous one, reflecting the highest possible ambition.
- **Timing of NDC Submissions:** NDCs are to be submitted by 2020, and then every five years (e.g., 2025, 2030).
- **Flexibility in Updating NDCs:** Parties can adjust their existing NDCs at any time to enhance their ambition (Article 4, paragraph 11).

India's Updated NDCs

- As per the updated NDC, India now stands committed to reduce Emissions Intensity of its **GDP by 45 percent by 2030, from 2005 level and achieve about 50 percent cumulative electric power** installed capacity from non-fossil fuel-based energy resources by 2030.

Progress

- India plans to reduce its emissions intensity **by 33 - 35% between 2005 and 2030**. However, India ' actions towards climate change mitigation have a strong development impact. To this effect , it is focusing on accelerating the use of **clean and renewable energy by 40% by 2030**, and on promoting efficient use of energy. **By 2030, we also intend to increase our carbon sinks by creating an additional capacity equivalent to 2.5 to 3 billion tonnes of CO$_2$ through significant aforestation efforts.**

1. To put forward and further propagate a **healthy and sustainable way of living** based on **traditions and values of conservation and moderation**, including through **a mass movement for 'LIFE'– 'Lifestyle for Environment'** as a key to combating climate change [UPDATED].

2. To adopt a **climate friendly and a cleaner path** than the one followed hitherto by others at corresponding level of economic development.

3. To reduce **Emissions Intensity of its GDP by 45 percent by 2030**, from 2005 level [UPDATED].

4. To achieve about **50 percent cumulative electric power installed capacity** from **non-fossil fuel-based energy resources** by **2030**, with the help of transfer of technology and low-cost international finance including from Green Climate Fund (GCF) [UPDATED].

5. To create an additional carbon sink of 2.5 to 3 billion tonnes of CO$_2$ equivalent through additional forest and tree cover by 2030.

Significance of NDCs

- The NDC reports **help countries coordinate their climate policies** action with one another. In the world's struggle to halt and reverse climate change, countries periodically report on their plans and progress in bringing down national levels of planet-warming carbon emissions.

Are NDCs on track with the Paris Agreement goals?

- Countries have made meaningful progress since the adoption of the Paris Agreement in 2015. Yet, current NDC commitments fall far short of what is needed to **limit global temperature rise to 1.5C, with current commitments on track for 2.5-2.9°C of warming.**

5.6   PATHOGEN SPILLOVER AND SPILLBACK

Context

- A significant chunk of the world's agricultural productivity and nutritional security relies on small insect pollinators.

About the Thai Sacbrood Virus

- The **Thai Sacbrood Virus (TSBV) primarily targets honeybee larvae**, affecting colony growth and reproduction, especially threatening **Asiatichoneybees (Apis cerana indica).** Its spread has been facilitated by the movement of bee colonies for commercial purposes.
- **In 1991-1992**, an outbreak wiped out **90% of Asiatic honey bee colonies in South India**, and the virus resurfaced in Telangana in 2021, with reports from China and Vietnam.

What is pollination?

- It is the act of **transferring pollen grains from the male anther** of a flower to the female stigma. The goal of every living organism, including plants, is to create offspring for the next generation. One of the ways that plants can **produce offspring is by making seeds**. Seeds contain the genetic information to produce a new plant.

Rising Threat of Diseases among Bees

- **Pathogen Spillover:** Decline in bee populations observed in Europe and North America, but limited data on bee populations in wildlife-rich areas like the Indian subcontinent. The Western honey bee (Apis mellifera) can carry diseases affecting both managed and wild bees. Pathogen spillover occurs when diseases spread between managed and wild bees sharing the same area.

- **Study on Disease Spread:** A study by Corina Maurer at ETH Zürich, Switzerland, found wild bees sharing flowers with honey bees had 10 times higher disease levels (e.g., deformed wing virus, black queen virus).
- **Impact of Habitat Loss:** Habitat loss forces bees into smaller areas, increasing disease transmission risks.
- **Expert Warning:** Axel Brockmann, a retired professor from Bangalore, warned that disease spread is more likely when wild and honey bees share the same habitat due to habitat loss.

> **Pathogen Spillover** occurs when a pathogen transfers from a domestic or non-native species to a wild species, like the spread of disease from managed honey bees to wild pollinators.
>
> **Pathogen Spillback** is the reverse, where a pathogen moves back to domesticated species from wild populations, causing further ecological impact, such as wildlife diseases being transmitted back to farm animals.

Way forward

- Pollinators need **good foraging resources, places that are rich in flowers pollen and nectar.** They need a place to **nest and to eat, and a natural, non-toxic environment**. Recommended practices include leaving some areas under **natural habitat, creating hedgerows, promoting intercropping, reducing or changing the usage of pesticides, leaving nesting sites** and planting attractive crops such as cassava around the field. **E.g., Such environments can still be found today in developing countries such as Kenya.**

5.7   WILDFIRE

Context
- Air pollution caused by wildfires is attributable to more than 1.5 million deaths a year globally, albeit with significant geographical and socioeconomic disparities, a new major study has found.

What are Wildfires?
- A wildfire, forest fire, or bushfire is an unplanned, uncontrolled and unpredictable fire in an area of combustible vegetation.
- Depending on the type of vegetation present, a wildfire may be more specifically identified as a bushfire (in Australia), desert fire, grass fire, hill fire, peat fire, prairie fire, vegetation fire, or veld fire. Some natural forest ecosystems depend on wildfire.
- Wildfires are different from controlled or prescribed burning, which are carried out to provide a benefit for people. Modern forest management often engages in prescribed burns to mitigate fire risk and promote natural forest cycles.

Causes of Wildfires
- **Natural causes:** Natural occurrences that can ignite wildfires without the involvement of humans include lightning, volcanic eruptions, sparks from rock falls, and spontaneous combustions.
- **Human activity:** Sources of human-caused fire may include arson, accidental ignition, or the uncontrolled use of fire in land-clearing and agriculture such as the slash-and-burn farming in Southeast Asia. In the tropics, farmers often practice the slash-and-burn method of clearing fields during the dry season.

Vulnerability of India's forest to wildfires
- It is estimated that the proportion of forest areas prone to fire annually ranges from 33% in some states to over 90% in others. The **Forest Survey of India (FSI) estimated that about 50% of the forest area** of the country is fire prone. It is estimated that **about 3.73 million ha**.
- Moderately dense forests recorded 43 per cent of the total forest fire incidents. The highest number of forest fire incidents occurred in tropical dry deciduous forests, followed by tropical moist deciduous forests and tropical semi-evergreen forests.
- The report determines that 15 per cent of the land in the country is prone to forest fires.
- According to data collected in the report, Madhya Pradesh (38), Uttar Pradesh (28) and Maharashtra (26) had the most districts vulnerable to forest fires.

Status of wildfires in the world
- Record-setting Forest fires are becoming the norm, with 2020, 2021, and 2023 marking the fourth, third, and first worst years for global forest fires, respectively.Nearly 12 million hectares — an area roughly the size of Nicaragua — burned in 2023, topping the previous record by about 24%. Extreme wildfires in Canada accounted for about two-thirds (65%) of the fire-driven tree cover loss last year and more than one-quarter (27%) of all tree cover loss globally.

How can wildfire risks be mitigated?
- **Defensible Space**: Create a buffer zone around homes by clearing vegetation and combustible materials to slow or stop wildfire spread.
- **Fuel Management:** Reduce flammable vegetation, thin tree canopies, and remove dead wood to lower fire intensity and spread.
- **Controlled Burns**: Intentionally set fires under controlled conditions to consume flammable materials and reduce wildfire risk.

- **Firebreaks and Vegetation Gaps**: Use natural features (rivers) or man-made features (roads) to interrupt wildfire progress.
- **Building Design**: Use fire-resistant materials and implement fire-safe landscape designs to reduce fire spread.
- **Emergency Planning**: Develop clear evacuation routes and communication protocols to ensure swift action in emergencies.
- **Community Education:** Educate residents on wildfire risks and how to reduce and respond to them effectively.

- **Early Detection Systems:** Improve systems to detect wildfires early, enabling rapid response to limit their impact.

Conclusion

- Incorporating wildfire risk mitigation into forest management strategies in fire-prone regions would help protect forest carbon and create jobs and support rural communities at the same time.

5.8   SHORT ARTICLES

National Biodiversity Strategy and Action Plan

Context

- India has introduced an updated biodiversity action plan aimed at conserving at least 30 percent of its land, freshwater, and marine areas by 2030.

About the National Biodiversity Strategy and Action Plan (NBSAP):

- It is a **strategic policy document**, which aims at providing direction at a national level on the management and **protection of biodiversity**. It also streamlines **various sectoral aspects to ensure sustainable use** of natural resources; this ensures a better quality of life and a reduction in biodiversity loss.

Key Details:

- **Principle instrument:** For implementing the United Nations Convention on Biological Diversity (CBD) at the national level.
- **Convention Requirement**: Each Party (signatory country) must develop an NBSAP or equivalent instrument, adapted to its unique conditions and capabilities.
- **Purpose of NBSAPs:** To enable national biodiversity planning, setting a defined course of action with specific targets and plans to achieve the objectives of the Convention on Biological Diversity.
- **Role in CBD:** NBSAPs are one of the strongest implementation mechanisms for fulfilling CBD objectives. (The **Convention on Biological Diversity** (**CBD**) is the first global agreement to cover all aspects of biological diversity)
- **Mainstreaming Requirement:** Each Party must ensure its NBSAP is integrated into the planning and activities of all relevant sectors that can positively or negatively impact biodiversity.
- **Global Submission Status**: As of 22 January 2024, 194 out of 196 Parties (99%) have developed NBSAPs under Article 6 of the Convention.

What is the NBSAP to 2030 aiming to achieve?

- The **NBSAP** to 2030 adopts a whole-of-government and whole-of-society approach to addressing biodiversity conservation efforts. The **NBSAP** to 2030 builds upon the momentum gained in this respect during the implementation of the previous NBSAP.

Methane diplomacy

Context

- The Baku meet is an opportunity for India to fast-track its efforts in reducing methane emissions.

Details:

- **Key Initiative:** Sponsored a summit on methane management with the UAE.

What is Methane diplomacy?

- It is a term used to describe international efforts to reduce methane emissions as part of climate change initiatives. It emphasizes collaboration between countries to address methane emissions from various sectors.
- **Diplomatic Context:** U.S. and China aligned on curbing non-CO2 emissions, including methane, ahead of COP28 in Dubai.

Background:

- The concentration of methane in the atmosphere is currently around two-and-a-half times greater than pre-industrial levels and is increasing steadily. This rise has important implications for climate change.
- Global Methane Budget – suggests that annual global methane emissions are around 570 Mt. This includes emissions from natural sources (around 40% of emissions) and those originating from human activity (the remaining 60%, known as anthropogenic emissions).
- **China's Development**: Released its first national plan addressing methane emissions, signaling a collaborative shift.
- **India's Opportunity**: Leverage diplomatic momentum for sector-specific aid to reduce methane emissions.
- **Sectoral Breakdown**: Agriculture: 74%, Waste: 14%, Energy: 11%, Industrial Sources: Small portion
- **Key Strategy for India:** Focus on methane reduction in waste management with international support.

A compelling case for action

- The World Energy Outlook has produced detailed estimates for methane emissions from oil and gas operations, which form the basis for the detailed data available in the Methane Tracker.
- The benefit to overcoming these hurdles would be enormous. Industry and other stakeholders recognise that policy and regulation can play a key role in addressing barriers to action and can align incentives to encourage companies to act.

COP29 Declaration on Reducing Methane from Organic Waste

Context

- Over 30 countries endorse COP29 Declaration on Reducing Methane from Organic Waste.

About Reducing Methane from Organic Waste Declaration:

- **Launch:** COP29, by the Presidency in collaboration with United Nations Environment Program Alignment with GMP-convened Climate and Clean Air Coalition (CCAC).
- **Signatories:** Over 30 countries, including 8 of the top 10 organic waste methane emitters.
- **Goal: To** reduce methane emissions from organic waste and meet targets in future Nationally Determined Contributions (NDCs).

Focus Areas:

- **NDC Integration**: Waste sector targets should be included in climate action plans.
- **Regulation**: Development of policies for better waste management.
- **Data**: Improving data collection on waste generation and methane sources.
- **Finance**: Mobilizing funds for solid waste management and reduction projects.
- **Partnerships**: Promoting cross-country collaboration to share best practices.

Alignment with Global Methane Pledge:

- Supports the 2021 Global Methane Pledge to reduce methane emissions by 30% below 2020 levels by 2030.

Priority Actions:

- Preventing organic waste generation.
- Promoting separate waste collection.

- Improving management of organic waste in landfills and wastewater facilities.

Global Energy Efficiency Alliance

Context

- The UAE has unveiled an ambitious initiative to establish the 'Global Energy Efficiency Alliance' during COP29, hosted in Azerbaijan.

Details

- **Global Pledge**: Aim to double annual energy efficiency improvement from 2% to 4% by 2030, with progress currently lagging at 1% in 2024.
- **COP28 Initiatives:** Launch of global collaborations like the UAE-led Global Energy Efficiency Alliance and several programs to boost efficiency.
- **Focus Areas:** Address energy challenges in Africa (outdated grids, low funding) and emerging economies (growth vs. efficiency).
- **Investment & Policy**: Urge tripling efficiency investments to $1.8 trillion by 2030, integrate energy efficiency into national policies, and modernize infrastructure.
- **Key Actions:** Accelerate financing, improve policy alignment, and strengthen awareness to meet the global efficiency target by 2030.

Exported emissions

Context:

- Fossil fuel exports have been a hot topic at the United Nations Climate Conference in Baku.

About Exported Emissions:

- **Exported Emissions**: Greenhouse gases from fossil fuels extracted in one country and exported to others are not included in the producer country's carbon footprint, despite contributing to global warming.
- **Climate Vulnerable Nations' Argument**: Countries exporting fossil fuels should take responsibility for emissions from their exports, as they significantly impact global climate change.

- **Paris Agreement**: While it mandates countries to reduce domestic emissions, it does not address emissions from exported fossil fuels, allowing continued global emissions through exports.
- **Global Fossil Fuel Export Trends**: Major exporters like the US, Norway, Australia, and Canada see emissions from exports surpass domestic levels. The US exports significant fossil fuels, including coal and gas, to various regions.
- **Responsibility Debate**: Activists and vulnerable nations call for accountability for exported emissions, while some exporting countries argue importing nations should bear responsibility.
- **Geopolitical Dimensions and CAT**: Geo-political considerations, such as Europe's reliance on US gas, influence fossil fuel trade. The Climate Action Tracker monitors progress on climate goals, projecting global temperature increases based on government actions.

Global Matchmaking Platform

Context

- On the Energy Day at COP29, United Nations Industrial Development Organization (UNIDO) and the Climate Club launched the Global Matchmaking Platform (GMP).
- The **Global Matchmaking Platform (GMP)** aims to accelerate the decarbonization of heavy-emitting industries in emerging and developing economies by connecting country-specific needs with global technical and financial assistance.

Purpose

- **Initiated at COP28 in December 2023 under the Climate Club,** the GMP focuses on reducing emissions in energy-intensive industrial sectors. It offers tailored support through a network of delivery partners, assisting nations with policy development, technology transfer, and investments to

achieve zero and low-emission industrial practices while enhancing emissions goals.

Collaboration

- **As a support mechanism of the Climate Club, the GMP's secretariat is hosted by UNIDO**, with additional backing from the **interim Climate Club Secretariat, jointly managed by the OECD and IEA.** The platform streamlines access to resources and guidance, enabling countries to customize their decarbonization strategies and achieve deep emissions reductions with comprehensive technical and financial support from partner organizations.

5.9   SNIPPETS

Topics	Details
Cat snakes	The Common Cat Snake (Boiga trigonata) is a slender, medium-sized, mildly venomous snake found across India (excluding northeastern states and islands), inhabiting various forests and elevations. It has a distinctive "Y"-shaped marking on its triangular head and preys on small vertebrates.
Tekdi spider	**Okinawiciustekdi** is a species of spider in the family Salticidae. It was described in 2024 by Tripathi & Kulkarni from Pune city in Maharashtra state of India. **Discovered:** It was discovered by Atharva Kulkarni, an MSc student from MIT-World Peace University, and Rishikesh Tripathi from Christ College, Kerala. **Significance:** The specific epithet is a noun apposition, derived from the Marathi word 'tekdi' that translates to 'hill' in English. To highlight the need for the conservation of flora and fauna of the unique urban hills of Pune city and similar habitats of tropical countries.
Chonkus	It was discovered in the shallow sunlit waters off the coast of Italy's Vulcano Island, where volcanic gas-rich groundwater seeps into the sea. The bacteria, known as **UTEX 3222 or "Chonkus**," is a strain of **Cyanobacterium aponinum** that was found to reach high-density growth in scientific experiments. Chonkus was taken from marine volcanic vents in the Mediterranean Sea that had an environment high in carbon dioxide.
Shettihali sanctuary	Shettihalli Wildlife Sanctuary, located in Karnataka and declared in 1974, features tropical evergreen, semi-evergreen, and deciduous forests. It houses the Tunga Anicut Dam, sheltering otters and water birds, and includes the Mandagadde Bird Sanctuary, a key nesting site on the Tunga River.
Crinum andhricum	Crinum andhricum, a newly discovered species in the family Amaryllidaceae, is endemic to the Eastern Ghats, Andhra Pradesh, India. This tall plant (up to 100 cm) features waxy white flowers (April–June) and thrives in dry rocky crevices, facing environmental threats due to its limited distribution.
Mealworm larvae	The lesser mealworm, the larval form of the Alphitobius darkling beetle, has gut bacteria like Proteobacteria and Firmicutes that produce enzymes capable of breaking down synthetic plastics such as polystyrene. Native to Africa, these larvae thrive in warm habitats, such as poultry houses, with their larval stage lasting 8-10 weeks.
Cao Bang crocodile newt	Tylototritonkoliaensis, also known as a crocodile newt, is a medium-sized salamander found in Vietnam's mountainous forests. It has a stout body with rough, wart-like skin, and is characterized by its black color with bright orange

	markings on the fingertips, toes, and tail. These newts breed in slow-flowing streams and hide under rocks during winter.
Koima	The newly identified Koima genus, endemic to the Western Ghats, includes two species, Koimaremadevii and Koimamonilis, characterized by their yellowish-brown bodies and hyaline fins. This discovery, based on morphological and genetic research, underscores the fragility of the region's aquatic ecosystems and highlights the need for conservation amid threats like habitat destruction and climate change.
Leucism	Leucism is a genetic condition that results in partial loss of pigmentation in animals, leading to white, pale, or patchy coloration while retaining normal eye colour. It is different from albinism, which involves a complete lack of melanin and often results in red or pink eyes.
Candidatus Phytoplasma	Sesame (Sesamum indicum L.) is an ancient oilseed crop, cultivated in semi-arid regions across India, with major production in West Bengal, Madhya Pradesh, and Rajasthan. It thrives in temperatures of 25-35°C and well-drained soils. Sesame oil, rich in antioxidants, is known for its medicinal and heart health benefits.
AroTrack	It detects harmful aromatic xenobiotic pollutants like phenol, benzene, and xylenols by using bacterial proteins that undergo ATP hydrolysis in the presence of these compounds, with a color change detected through an LED-phototransistor assembly. It is a low-cost, portable, battery-operated sensor that works in water temperatures up to 50°C, completing tests in under 30 minutes, making it ideal for use in rural and low-income areas.
Oarfish	A rare deep-sea creature, known as the 'doomsday fish,' recently washed ashore the Grandview Beach in Encinitas, California.
Antlion	Myrmeliontidae, found in sandy regions worldwide, are nocturnal, weak fliers with long, slender bodies and sickle-shaped jaws. They prey on ants by trapping them in cone-shaped pits, offering pest control benefits.
Imperial eagle	The Aquila heliaca (Eastern Imperial Eagle) is a migratory bird found in Southeastern Europe, West and Central Asia, with a vulnerable status. It prefers old forests and builds large nests in tall trees, exhibiting reverse sexual dimorphism.
Mink whales	The common minke whale (Balaenoptera acutorostrata) is the smallest rorqual, found in all ocean basins from tropical to polar regions, while the Antarctic minke whale (B. bonaerensis) is limited to the Southern Hemisphere. The common minke whale is of least concern, and the Antarctic minke whale is data deficient.
Trishna WLS	Located in South Tripura District and established in 1988, the sanctuary features diverse forests, medicinal plants, and species like Gaur, Hoolock Gibbon, and Golden Langur. It includes rivulets, waterbodies, grasslands, and bamboo species like Kaillai.
Tungareshwar sanctuary	Palghar district, Maharashtra, located 75 km from Mumbai, connects Sanjay Gandhi National Park and Tansa Wildlife Sanctuary, featuring hilly terrain, dense forests, and diverse wildlife. Notable for ancient temples, including the Tungareshwar Temple dedicated to Lord Shiva.

Cicadas	Cicadas, known for their loud songs, are diverse in India and Bangladesh, with species either emerging annually or after 13-17 years. They camouflage in trees to avoid predators, with only seven species being periodical.
Raorchestesasakgrensis	A new species of frog was discovered in the Eman Asakgre Community Reserve, Garo Hills, Meghalaya, named to honor local conservation efforts. It is a small arboreal frog with a pointed snout and visible tympanum, found at 174 meters elevation. Males measure 20.49 mm and females 22.8 mm in snout-vent length. Males call from shrubs at dusk, with peak activity after the first monsoon rains.
Bar-tailed godwits	Limosalapponica, a large wader with an upturned bill and red breeding plumage, migrates from Alaska to New Zealand, covering over 29,000 km. It breeds in Arctic regions, feeds on bristle worms and coastal invertebrates, and is classified as Near Threatened due to population decline.
Dunlin	Dunlin, a small shorebird with a droopy bill, which is facing threat to its survival, was among the 192 avian species spotted during the recently held Kochi edition of the Kerala Bird Race.
Siberian Demoiselle crane	The Demoiselle Crane, known as Koonj or Kurjaa in Indian culture, migrates across Central Eurasia and enters India through the Himalayas. Found in wetlands, it faces threats like habitat loss, hunting, and the illegal pet trade, though it is classified as Least Concern by the IUCN.
The black-footed ferret	It is nocturnal and solitary predator, is native to North America's Great Plains and relies heavily on prairie dogs for survival. Listed as endangered by the IUCN, it faces threats like habitat loss and plague, with cloning offering new hope for its conservation.

5.10 ADDITIONAL TOPICS FOR READING FROM IASGYAN WEBSITE

TOPIC NAME	UPLOADED ON IAS GYAN WEBSITE ON
Why 1.5°C goal is unrealistic, GHEC	2ND NOV
Lancet Countdown on Health and Climate Change	4TH NOV
Sendai Framework for Disaster Risk Reduction	5TH NOV
Gastrodialohitensis, Chattim trees, Durgesh Aranya Zoological Park	5TH NOV
Village relocation from Tiger Reserves	6TH NOV
Heavy metal pollution	7TH NOV
Animal Health Security Strengthening in India for Pandemic Preparedness and Response	9TH NOV
Baku and the climate finance goal	9TH NOV
Microplastics in clouds and environment	11TH NOV
Species in news: Arpactophilus species, Otavalo's Andean mouse PIN: Amchang Wildlife Sanctuary, Shettihali sanctuary	12TH NOV
Dicliptera	13TH NOV

Rising CO2 emissions	14TH NOV
Species in news: Corpse flower, Comb jelly, sturgeon	14TH NOV
State of the Climate 2024 Update for COP29	15TH NOV
Eco-clearance for industries	16TH NOV
Avian botulism	18TH NOV
Species in news: Diclipterasrisailamica, zebrafish, scarlet tenager	18TH NOV
PIN: Nugu WLS, 56TH Tiger reserve	19TH NOV
Species in news: Kaalinga, Senna Tora, Cao Bang crocodile newt, Koima	19TH NOV
Mystery Mollusk" Discovered in Ocean's Midnight Z	19TH NOV
'Are G20 Countries Delivering on Climate Goals? **Delhi-NCR's Choking Air pollution** **Can fossil fuels be regulated like nuclear weapons?** **India's path to Net zero**	20TH NOV
High-performance buildings (HPBs) **African penguins**	22ND NOV
India needs an environmental health regulatory agency	23rd NOV
Mapping the impact of climate change on global displacement	28thNOV
Black thrips and chilli crop	29TH NOV
Climate Change Performance Index	27th NOV

6. SCIENCE & TECHNOLOGY AND HEALTH

6.1   RISING STEM RESEARCH DEMANDS REVITALISED EDUCATION

Context

- While private engineering colleges, the newer IITs and universities have expanded access to education over the last few decades, studies show that a vast majority of students graduating from these colleges lack the basic skills that are required by industry.

Status of Scientific Research

India's Scientific Capabilities

- India has a large talent pool in science & engineering, extensive research institutions, & involvement in advanced fields.
- However, it faces significant challenges in research advancement compared to other countries.
- With fewer students choosing higher studies, & faculty shortages, this issue might worsen.
- Large investments in fields like quantum computing & artificial intelligence (AI) may not be fully used without skilled students.

Research and Development

Aspect	Details
GDP Allocation	India's R&D spending is about 0.65% of GDP, below its 2% target and lower than the global average of 1.79% (2021 UNESCO).
Global Ranking	Ranked 38th for countries spending over 1% of GDP on R&D.
Spending Gap	In 2018, India's R&D expenditure in PPP was $68 billion (6th globally), far behind top countries like the US and China (over $500 billion each).
Per Researcher Spending	India spends only $42 (PPP) per researcher; top countries like Israel and South Korea exceed $2,000 per researcher.
Women Researchers	Women represent only 18% of India's researchers, compared to a global average of 33%.
Research Institutions	Of India's 40,000+ colleges and 1,200 universities, only 1% are actively involved in research.
Private Sector Research	India has 5,200+ private R&D units, but most focus on industry-specific rather than fundamental research.
Doctoral Degrees	India awarded 25,550 doctoral degrees in 2020-21, with 59% in science and engineering fields, ranking 7th globally.
Researchers per Million	India has 262 researchers per million, lower than many developing nations (e.g., Brazil: 888; South Africa: 484).
International Doctorates	Between 2001-2020, 36,565 Indians obtained US doctorates, with 94% in science and engineering, second only to China in this category.
Patent Filings	India ranked 6th globally with 61,573 patents filed in 2021, significantly lower than China (1.6 million) and the US (600,000).

Initiatives by government

Initiative	Description
Digital India, Make in India, Start-up India	They encourage manufacturing growth, FDI, & technology transfer and access to& foster a digital economy.
National Skills Development Mission	Trains approximately 400 million people by 2022 in various skills, including scientific and technical skills.
National Artificial Intelligence Strategy	Establishes a vision and roadmap to harness AI in sectors like healthcare, agriculture, and education, promoting technological advancement.
Increased Science &Technology Budget	Raised budget allocation by 30% for 2022-23, emphasizing research, talent development, and international collaborations.
National Research Foundation (NRF)	An apex body (through the NRF Bill 2023) to oversee, fund, and coordinate research activities, promoting innovation, equity, and international partnerships.
Prime Minister's STI Advisory Council (PM-STIAC)	Advises on strategic priorities and policies in science, technology, and innovation, guiding national initiatives and programs.
New Education Policy (NEP) 2020	Aims to integrate scientific temper, creativity, and critical thinking in education, promoting interdisciplinary learning.
Incentives for Scientific Publications and Patents	Encourages research output by offering incentives, recognition, and institutional support, aiming to improve quality and quantity.
Industry-Academia Linkages	Enhances technology transfer, incubation, entrepreneurship, & innovation ecosystems, bridging gaps between industry and academia.
International Cooperation	Expands partnerships in science research through global events, bilateral and multilateral agreements, and mega-science projects.

Why Training Quality Matters?

- One main reason for the skills gap is the quality of teaching. In many teaching institutions, teachers are under pressure to publish research papers, which can take time away from teaching students well. Because of this, graduates may lack skills, affecting industries and research. While programs like internships & online courses help, they are not enough to meet the high demand for skilled professionals.

Way Forward

- Teaching institutions need to **focus more on effective teaching methods & less on research output**.
- Faculty development programs &mentorship are essential.
- **Collaborating with research institutions could also help teachers improve their teaching skills**.
- **Setting up teaching tracks**, like "assistant professor of teaching," could allow teachers who want to teach to focus on that, while those interested in research can collaborate with research-focused institutions.
- Another idea is for **research institutions and teaching institutions to partner for joint degree programs.** For example, students from a teaching institution could complete their final years in a research institution. This kind of program could improve both student quality and curriculum. Similar programs exist in the U.S. and work well to improve student skills and teaching standards.

6.2   ORPHAN DRUGS

Context

- Orphan drugs, critical in treating rare diseases, have increasingly gained attention in India following the implementation of the National Policy for Rare Diseases (NPRD) in 2021.

What Are Orphan Drugs?

- Orphan drugs are **special medicines used to treat rare diseases, which can sometimes be life-threatening or cause long-term health issues.**
- While these drugs are critical for those with rare diseases, developing them is very costly, and India faces unique challenges in making them available.
- **Global Standards**: Different countries have set criteria for orphan diseases:
  o In the **U.S.**, a disease is rare if it affects fewer than 200,000 people.
  o In the **European Union**, a disease is rare if it affects fewer than 1 in 10,000 people.
  o In **India**, there is no exact definition for orphan diseases, but the National Policy for Rare Diseases (NPRD) provides some guidelines.

Why Developing Orphan Drugs is Difficult in India?

- **Even though India produces all 450 of the world's orphan medications (APIs), the majority of these medications are not readily available and are not reasonably priced here.**
- Developing orphan drugs is expensive, and the small number of patients makes it hard for companies to profit.
- Since rare diseases affect few people, finding enough participants for clinical trials is challenging.
- Many treatments are very expensive, such as enzyme replacement therapies (ERTs), costing crores of rupees per year, making them unaffordable for most Indian families.
- India doesn't have a clear definition for rare diseases or enough data, which makes drug development harder.
- Unlike the U.S. or EU, India doesn't offer big tax breaks or other financial incentives for companies working on orphan drugs.
- Currently, 14,615 cases are recorded in India's rare disease registry, but a central national registry is needed for accurate data and better planning.

How Can India Improve Orphan Drug Availability?

- A **central registry** would help track the prevalence of rare diseases.
- **Introducing tax breaks, grants, and subsidies** can motivate companies to develop orphan drugs.
- **Policies to control prices and offer subsidies** could make these drugs more affordable.

6.3   SHORT ARTICLES

Global TB Report 2024

Context

- The World Health Organization (WHO) released its Global TB Report 2024 on October 29, 2024. The report has acknowledged the tremendous progress India has made in closing the gap of missed TB cases since 2015.

Highlights of the report

TB Case Detection and Treatment Coverage

- In 2023, India had around 27 lakh TB cases. 25.1 lakh cases were diagnosed and treated, raising treatment coverage to 89% (up from 72% in 2015).
- **TB cases dropped from 237 per lakh population in 2015 to 195 per lakh in 2023. This 17.7% decline is more than double the global average decline of 8.3%.**

Efforts to Decentralize Healthcare

- India has set up over **1.7 lakh Ayushman Arogya Mandirs** to make healthcare accessible.

Reduction in TB Mortality

- **TB deaths decreased from 28 per lakh population to 22 per lakh,** a 21.4% reduction.

Increased Funding and Resources

- India's TB program **budget increased from Rs. 640 crores in 2015 to Rs. 3400 crores in 2022-23**. The program uses advanced diagnostic tools and provides free screening, diagnosis, and treatment.
- The **private sector contributed to 32.9% of TB case notifications** in 2023. India is also using 800 AI-enabled portable chest X-ray machines and has 7,767 rapid molecular testing facilities across the country.

Nutrition Support for TB Patients

- Under the **Ni-Kshay Poshan Yojana**, monthly nutritional support increased from Rs. 500 to Rs. 1,000 per patient. **Energy Dense Nutritional Supplements** (EDNS) are provided to undernourished TB patients.
- **Ni-Kshay Mitras** provide food baskets to the families of TB patients to improve immunity and reduce out-of-pocket expenses.

New Treatment for MDR-TB

- In September 2024, **India introduced the BPaLM regimen for Multi-Drug-Resistant Tuberculosis (MDR-TB),** a shorter and effective treatment.

Increase in TB Notifications

- From January to September 2024, 19.88 lakh TB cases were reported, a 4.2% increase from the same period in 2023. Private sector notifications rose to 7.22 lakh cases (Jan-Sept 2024).

Achievements Under Pradhan Mantri TB Mukt Bharat Abhiyan

- 54,448 new Ni-KshayMitras registered, and 8.3 lakh food baskets distributed in 2024 (Jan-Oct). TB preventive treatment provided to 12.23 lakh beneficiaries in 2024.

RNA Editing

Context

A biotechnology company from Massachusetts, U.S., called Wave Life Sciences, became the first company to treat a genetic disease by editing RNA at the clinical level.

Importance of RNA in Genetic Science

RNA is crucial for various functions in our body. One of these functions, called **RNA interference, allows small RNA molecules to prevent a gene from being expressed.** This function has helped make gene-editing tools like CRISPR-Cas9 effective.

The quick development of mRNA vaccines for COVID-19 also showed how important RNA is beyond just gene expression.

What is RNA Editing?

RNA editing is a process where scientists correct mistakes in the RNA. Here's how it works:

1. **Making Proteins:** Cells use instructions in DNA to create messenger RNA (mRNA). Then, they use this mRNA to make proteins that the body needs.
2. **Mistakes in mRNA:** Sometimes, the cell makes errors in the mRNA, leading to faulty proteins. These incorrect proteins can cause serious health issues.
3. **How RNA Editing Helps:** RNA editing allows scientists to fix these mistakes in the mRNA before the cell makes the proteins, helping produce normal proteins instead.

RNA Editing vs DNA Editing

Feature	RNA Editing	DNA Editing
Type of Change	Temporary changes to RNA	Permanent changes to DNA
Effect on Genome	No change to the genome itself	Alters the genome permanently
Risk of Side Effects	Lower risk; uses enzymes already in the body	Higher risk; uses proteins from bacteria that may cause immune reactions
Reversibility	Effects fade over time; can stop treatment	Irreversible once edited
Ideal Use	Short-term treatments or reversible effects	Permanent fixes for genetic issues
Safety	Generally safer due to temporary changes	Higher risks with permanent changes
Tools Used	ADAR enzymes (already found in the body)	CRISPR-Cas9 and other tools (from bacteria)
Challenges	Needs repeated treatments; can target the wrong spot	Can cause unintended changes in DNA
Examples of Use	Treating lung and liver disorders, eye conditions	Curing genetic diseases, like sickle cell anemia

India's Nutraceutical Market

Context

- India's Nutraceutical Industry is poised for Global Growth with supportive initiatives.

About

- **Nutraceuticals are products that aren't exactly food or medicine but have qualities of both.** They help keep us healthy, control symptoms, and prevent certain serious diseases.

- The word "nutraceutical" combines "nutrient" (a part of food that nourishes us) and "pharmaceutical" (a medical drug). This term was created in 1989 by Stephen DeFelice, who founded the Foundation for Innovation in Medicine.

Importance

- **The idea behind nutraceuticals is to focus on prevention – to stop health issues before they start**. This idea comes from the famous saying by Hippocrates, the "father of medicine," who said, "Let food be your medicine."

Global Market

- The global nutraceutical market is approximately **$400 billion**.
- Currently, **90% of the total global nutraceutical market is captured by the USA, Japan and Europe.**

India's Nutraceutical Market Growth

- India's share in the global nutraceutical market remains under **2%**.
- **India's nutraceutical market is prepped to be a global leader at USD 4-5 billion**. It is expected to grow approximately USD 18 billion by 2025.
- The Indian nutraceuticals industry grew at 25% annually during the pandemic. The Foreign Direct Investment (FDI) has also increased from USD 131.4 million (FY12) to USD 584.7 million (FY19).
- The nutraceutical market **already occupies 67% share beating the pharma dominated supplement market**.

Current trends

- **Indian population has begun to believe in immunity-boosting supplements** and has led to a significant shift in buying patterns and market behaviour.
- The **urban population across India have become health and fitness conscious like never before.**
- Nutraceutical manufacturers and marketers have **come up with new ways to make the consumer aware about the product, its**

benefits and role in preventative healthcare as well as medical treatment.

Challenges

- **Lack of Defined Industry Classification**.
- **Complex Regulatory Environment**.

GSAT-N2 Satellite (GSAT 20)

Context

- India's GSAT-N2 communication satellite was successfully launched into space by SpaceX's Falcon-9 rocket. This marked India's first collaboration with SpaceX, a company led by Elon Musk.

What is GSAT-N2?

- GSAT-N2 (also known as CMS-03 or GSAT-20) is a **high-throughput communication satellite developed to enhance broadband services and in-flight connectivity across India** including remote regions like the Andaman and Nicobar Islands and Lakshadweep.

Specifications

- Weight: 4,700 kg at liftoff
- Mission life: 14 years
- Frequency: Operates on the Ka-band, allowing faster and more efficient communication.
- Spot beams: 32 user beams covering the entire Indian region.

32 Beams for Wide Coverage

- 8 narrow beams for the northeast region.
- 24 wide beams for the rest of India.
- All beams are supported by hub stations on mainland India.

High Throughput

- The satellite can provide a data transfer speed of 48 Gbps using its Ka-band HTS (High Throughput Satellite) payload.

Advanced Equipment

- Equipped with Sun, Earth, and Star Sensors for accurate positioning.
- Carries an Inertial Reference Unit (IRU) for precise attitude data.

Reflectors and Configuration

- Features three parabolic 2.5-meter deployable reflectors.
- Uses a single feed per beam setup to generate 32 spot beams over India.

Purpose

- Enhances communication infrastructure for India's **Smart Cities Mission.**
- Adds significant data transmission capacity.

What Makes This Launch Special?

- This is the **first time India partnered with SpaceX to launch a satellite.**
- GSAT-N2 is **NSIL's second demand-driven satellite**. Such satellites are built and operated to meet specific user needs, following reforms introduced by the Indian government in 2020.
- **GSAT-24** launched in June 2022, it was NSIL's first demand-driven satellite. Its capacity was fully booked by Tata Play.

Diabetes Epidemic in India

Context

- India is at the center of the global diabetes epidemic. As highlighted in The Lancet and 3.

WHO reports, the country must focus on improving diagnosis, promoting lifestyle changes and achieving the **2030 WHO targets**.

Global Diabetes Situation

- In **1990**, about **200 million people** globally had diabetes. By **2022**, this number increased to over **800 million** as per data published in The Lancet. The global prevalence of diabetes in adults doubled from **7% in 1990 to 14% in 2022**.

Diabetes in India

- India has the **highest number of diabetes cases** in the world. **212 million people** are living with diabetes. **133 million people** above the age of 30 remain untreated compared to **78 million untreated cases in China**.
- With **133 million undiagnosed cases**, India must act fast.

WHO Targets

- WHO has set targets for **2030**:
  1. **80% of people with diabetes must be diagnosed.**
  2. **80% of those diagnosed must have good control over their blood sugar levels.**

6.4   SNIPPETS

Technology in News

Topics	Details
PyPIM	- Israeli researchers from the Israel Institute of Technology have created a new kind of software that could make computers faster and more energy-efficient. - This technology, called in-memory processing, allows computers to handle data directly in memory instead of relying heavily on the central processing unit (CPU). - In modern computers, there is a gap between how fast data can be processed and how quickly it can be moved between memory and the CPU. **This gap is called the "memory wall."** - When data is transferred between memory and the CPU, it takes up time and energy, slowing down the overall speed. - In-memory processing allows **computers to do some calculations right where the data is stored—in memory**. - This approach reduces the need to transfer data to the CPU for every task. By handling data directly in memory, computers can save time and energy, making them faster and more efficient.

Diseases in News

Topics	Details
Chronic Wasting Disease	• New York State Departments of Agriculture and Market and Environmental Conservation, in coordination with the State Department of Health, confirmed a case of Chronic Wasting Disease. • Chronic wasting disease, sometimes called zombie deer disease, is a transmissible spongiform encephalopathy affecting deer. • It is a prion disease that affects deer, elk, moose, and other members of the cervid family. • It is a fatal neurological disease with no known cure. • Cervidae is a family of **hoofed ruminant mammals** in the order Artiodactyla. A member of this family is called a deer or a cervid.
Snakebite Envenoming	• The Tamil Nadu government has taken an important step to manage this issue by officially making snakebite envenomation a notifiable disease. • When a disease is made "notifiable," it means that health facilities must report all cases of the disease to the government. • The **World Health Organization's International Health Regulations, 1969** require disease reporting to the WHO in order to help with its global surveillance and advisory role. • The Centre has notified several diseases such as cholera, diphtheria, encephalitis, leprosy, meningitis, pertussis (whooping cough), plague, tuberculosis, AIDS, hepatitis, measles, yellow fever, malaria dengue, etc. • The onus of notifying any disease and the implementation lies with the state government. • **Any failure to report a notifiable disease is a criminal offence and the state government can take necessary actions against defaulters.** • Snakebite envenoming **happens when a venomous snake injects poison (venom) into a person through its bite.** • Venom can cause serious health problems, including damage to nerves, blood problems, kidney failure, and tissue damage.
Thrombotic Thrombocytopenic Purpura	• A study published in a journal has found an association between the inactivated COVID-19 vaccine CoronaVac from Sinovac Biotech and immune thrombotic thrombocytopenic purpura (TTP). • TTP is a condition **where small blood clots form throughout the body's small blood vessels**. These clots can block blood flow to organs like the brain, heart, and kidneys, leading to serious health problems. • When these clots form, they use up the platelets in the blood (platelets help with blood clotting). This means there are fewer platelets left in the bloodstream, which can lead to bleeding and bruising. • TTP is often **caused by a problem with an enzyme called ADAMTS13**. This enzyme normally prevents clots from forming by breaking down a specific protein in the blood. When ADAMTS13 levels are too low or the enzyme doesn't work correctly, the blood clots start to form.
Toxic Epidermal	• Researchers from **Australia** and **Germany** have made a significant medical

Necrolysis	breakthrough by developing the first-ever **cure for Toxic Epidermal Necrolysis (TEN)**, a rare and potentially fatal skin disease. • The researchers discovered that **hyperactivation of the JAK-STAT signaling pathway** is a major driver of TEN. • The JAK-STAT signaling pathway is a chain of protein interactions that transmits extracellular signals to the nucleus of a cell, causing changes in DNA transcription. • It plays a central role in cell function and regulates many cellular processes, including immunity, cell division, cell death, tumor formation, proliferation, migration, and differentiation. • The team used **JAK inhibitors**, a class of drugs already in use for inflammatory diseases, to treat patients with TEN. • **Toxic Epidermal Necrolysis (TEN),** also known as **Lyell's Syndrome**, is a very rare, but serious skin condition where the top layer of the skin, called the **epidermis**, detaches from the layers below.

CKM Syndrome	• Cardiovascular Kidney Metabolic (CKM) Syndrome **reflects the interconnected impact of lifestyle, globalization, and urbanization on health.** This complex syndrome is increasingly common and often goes undetected until it escalates into more severe health issues affecting multiple organs.
	• It is a health condition involving interrelated issues in the cardiovascular, kidney, and metabolic systems.
	• It is recognized by experts as a significant public health concern due to its impact on chronic diseases like heart disease, kidney disease and diabetes.
	• **Stages of CKM Syndrome**
	  o Early stages (Stage 1) focus on preventive care, like healthy eating and regular exercise, to manage weight and blood pressure.
	  o In later stages, such as Stage 4, symptoms can include severe heart disease and even kidney failure. Here, individualized treatment becomes essential.

Walking Pneumonia	• Recent weeks, doctors have reported cases of "walking pneumonia," a mild yet persistent lung infection that can mimic symptoms of a common cold. **Walking Pneumonia** **Severity** • Mild • Mostly caused by *Mycoplasma pneumoniae*. **Symptoms** • Cough, sore throat, mild fever **Contagion** • Highly contagious **Treatment** • Rest, fluids, sometimes antibiotics **Recovery Time** • Usually a few weeks **Regular Pneumonia** **Severity** • Moderate to severe

	• Caused by bacteria (*Streptococcus pneumoniae*), viruses, fungi, or protozoa. **Symptoms** • High fever, chest pain, difficulty breathing **Contagion** • May or may not be contagious **Treatment** • Antibiotics, hospitalization in severe cases **Recovery Time** • Can take longer; requires more care
Aphantasia	• A recent study published in Current Biology by Roberto S. Luciani and colleagues at the University of Glasgow explores the relationship between auditory and visual senses in people with Aphantasia condition. • Aphantasia is a **condition where some people cannot create pictures in their minds.** • For example, if you close your eyes and think of an apple, most people can "see" an apple in their minds, even if it's not really there. But people with aphantasia can't do this—they just see darkness or nothing at all. • Aphantasia, first observed in the 1880s by British polymath **Francis Galton** and later named in 2015 by neurologist **Adam Zeman**, is a condition where individuals have limited or no ability to visualize images in their mind.
National Epilepsy Day 2024	• National Epilepsy Day is marked every year in India on November 17. • National Epilepsy Day was initiated by the Epilepsy Foundation of India which was founded by Dr Nirmal Surya in Mumbai in 2009. • As per the WHO, nearly 50 million people around the world are affected by the disease while India accounts for 10-20 percent. • Epilepsy is a brain disease where nerve cells don't signal properly, which causes seizures.
Jeddah Commitments to accelerate action on AMR	• Building on the momentum of the UNGA High-Level Meeting on Antimicrobial Resistance (AMR) this September, the Fourth Global High-Level Ministerial Conference on AMR was held in Jeddah, Saudi Arabia. • It is a comprehensive framework for global action to combat AMR through a One Health approach. • These commitments aim to translate the commitments outlined in the Political Declaration of the High-Level Meeting on Antimicrobial Resistance into actionable steps. • These focus on strengthening governance, stewardship, surveillance, capacity development, research and development, manufacturing, access, and disposal to address AMR challenges.
Sjögren's Disease	• While global estimates suggest that Sjögren's affects 1 in 1,000 people, there is precise data for India. • Sjögren's disease, also called Sjögren's syndrome, is a **chronic autoimmune disorder primarily affecting the exocrine glands leading to decreased secretion of saliva and tears.** • Named after Swedish ophthalmologist Henrik Sjögren, who first described it in 1933 the disease involves systemic immune-mediated damage beyond the

glands with potential impacts on various organs.

Chemicals/Materials/Compounds in News

Topics	Details

Il-35 Protein	• Researchers have identified a specific protein called **IL-35**, which can help treat **Type 1 and autoimmune diabetes** by protecting the immune system.
	• IL-35 is a unique protein made up of two parts: **IL-12α** and **IL-27β chains**, encoded by the **IL12A** and **EBI3 genes**
	• IL-35 helps in regulating immune cells, which plays a protective role in diabetes:
	   o It controls **macrophage activation**, which is essential in fighting infections but can harm pancreatic cells in diabetes.
	   o It manages **T-cell proteins** and **regulatory B cells** that affect the immune response.
	   o IL-35 also prevents certain immune cells from attacking **pancreatic beta cells**, which produce insulin, thereby lowering inflammation and protecting these cells.

Allulose	• South Korea has become a top testing ground for the sweetener allulose, a potential rival to sugar substitutes like stevia that is finding favour among both local food influencers and big domestic food companies, which are ramping up production. • Allulose is also known as D-psicose. It's classified as a rare sugar because it's naturally present in only a few foods. Wheat, figs, and molasses all contain it. • Some people describe allulose as having a similar taste and texture to table sugar. It's about 70% as sweet as sugar, which is similar to the sweetness of erythritol, another popular sweetener. • Like glucose and fructose, allulose is a monosaccharide, or single sugar. • In contrast, table sugar, also known as sucrose, is a disaccharide made of glucose and fructose joined together. • Allulose has the same chemical formula as fructose but is arranged differently. This difference in structure prevents your body from processing allulose the way it processes fructose.
Gluten	• While gluten is useful in baking, it can cause serious health issues for some people. When gluten reaches the small intestine, it can cause **gastrointestinal problems** for people with gluten intolerance. The most common and severe condition linked to gluten is **coeliac disease**. • Coeliac disease is a **condition in which the immune system reacts severely to gluten.** • When people with coeliac disease eat gluten, their immune system attacks their own body's proteins in the small intestine. • Coeliac disease affects around 2% of the population. • Gluten is a type of protein found in certain grains, especially **wheat**, **barley**, and **rye**. • It's what makes dough (like pizza or bread dough) stretchy and helps it hold

	its shape. When you mix flour and water and knead it, gluten forms a sticky, stretchy network that allows the dough to rise and gives baked goods a chewy texture. • **Gliadins** and **Glutenins** are the main proteins in gluten.
Compounded and Generic Drugs	• Novo Nordisk, a company that makes popular diabetes and weight-loss drugs like Ozempic and Wegovy, is asking the FDA to stop compounding pharmacies from making copycat versions of its drug ingredient, semaglutide. • Compounded drugs are **specially prepared medications created by pharmacists based on a doctor's prescription to meet an individual's specific needs**. • This is common when a patient requires a particular dose, form (like a liquid instead of a pill) or ingredient adjustments. • Generic drugs are **medications that have the same active ingredients, strength, and dosage form as brand-name drugs but they are produced and sold under their chemical name once the brand's patent expires**. • They provide the same therapeutic benefits but usually cost less.
Methamphetamine	• Indian authorities intercepted an Iranian vessel off the coast of Gujarat uncovering a massive drug smuggling operation seizing approximately 700 kg of methamphetamine. • Methamphetamine **often called meth** is a powerful and highly addictive drug. • It is a stimulant meaning it speeds up how the brain and body work. • **Meth is usually found as a white powder, but it can also be made into shiny crystals known as "crystal meth."** • Sometimes it is available as a **prescription drug called Desoxyn** used for treating obesity and ADHD under strict medical supervision.
Cannabinol	• Scientists at the University of Sydney have provided the first objective evidence that cannabinol (CBN) - a constituent of cannabis, can improve sleep. • Cannabidiol, commonly known as **CBD**, is a chemical compound found in the **Cannabis plant**. • It is one of over 100 compounds called **cannabinoids**. • Unlike another well-known cannabinoid called **THC (tetrahydrocannabinol)**, CBD does not make people feel "high." • It was the first cannabinoid to be isolated from cannabis and was discovered in 1896.
Lipids	• A low metabolic flexibility to lipid (MetF-lip) in skeletal muscle may promote ectopic lipid accumulation, thus inducing metabolic disturbances. • Metabolic flexibility is the capacity to adapt fuel oxidation to fuel availability so ATP synthesis can match its demand. • ATP synthesis is the process of creating adenosine triphosphate (ATP), the cell's energy carrier, using energy from catabolic mechanisms like cellular respiration, beta-oxidation and ketosis. • Lipids are organic molecules made mostly of **carbon**, **hydrogen**, and **oxygen**.

	• They are **hydrophobic**, meaning they do not dissolve in water. • Lipids are a source of energy, help in building cell membranes and play a role in hormones and vitamins.
New Moiré Superconductor	• The discovery of superconductivity in moiré materials made from semiconductors specifically twisted bilayer tungsten diselenide ($tWSe_2$) represents a significant advancement in the field of quantum materials. • Moiré materials are two-dimensional systems created by stacking two layers of material and twisting one layer by a small angle. • **The twist generates a moiré pattern an interference pattern that profoundly alters the material's properties creating unique quantum behaviors not present in the individual layers.**
Structural Material	• The development of a new **structural battery material** by scientists at Chalmers University of Technology in Sweden has the potential to revolutionize electric vehicles (EVs) and portable electronics. **Material Composition** • Made of **carbon fiber composite** with tensile strength similar to **aluminum**. **Dual Functionality** • Stores energy like a battery. • Functions as a **structural component** reducing weight. **Energy Density** • 30 Watt-hours per kilogram (Wh/kg). **Efficiency Trade-off** • While lower in energy density compared to traditional batteries, it offsets with structural integration.
Nafithromycin	• Dr. Jitendra Singh announces soft launch of India's First Indigenous Antibiotic, Nafithromycin, to Combat Drug Resistance. **Developer** • Developed with support from Biotechnology Industry Research Assistance Council (BIRAC) by Wockhardt. **Trade Name** • Miqnaf. **Target Condition** • Community-Acquired Bacterial Pneumonia (CABP) especially drug-resistant strains. **Mechanism of Action** • Targets both typical and atypical pathogens effectively. **Efficacy** • Ten times more effective than azithromycin; minimal gastrointestinal side effects. **Safety and Versatility** • Fewer drug interactions and unaffected by food consumption. **Global Milestone** • First in its class developed globally in over 30 years. **Support Mechanism** • BIRAC's Biotechnology Industry Partnership Program (BIPP)

Space in News

Topics	Details
Coronagraph	• Scientists at the Indian Institute of Astrophysics (IIA) Bengaluru have reported the "first significant" results from the Visible Emission Line Coronagraph (VELC) payload onboard the ADITYA-L1. • The VELC instrument, developed by IIA and ISRO is **designed to closely observe the outer layer of the Sun, called the corona**. • This tool is stationed at Lagrange point L1, where it can constantly monitor the Sun without any interference from Earth. • VELC lets scientists see CMEs when they are still close to the Sun's surface. • **These early observations give scientists important information on how CMEs form and develop, helping them improve predictions about space weather.**
Lignosat	• The world's first wooden satellite, built by Japanese researchers, was launched into space, in an early test of using timber in lunar and Mars exploration. • **It has been created by researchers at Kyoto University and Sumitomo Forestry**. • This **small, cube-shaped satellite aims to showcase the potential of using timber in space technology**. • Unlike metal satellites, which create harmful particles when they re-enter Earth's atmosphere, a **wooden satellite would burn up without leaving pollutants.** • Since space lacks oxygen and water, **wood doesn't rot or catch fire as it might on Earth, making it surprisingly durable**.
Analog Space Mission	• ISRO has started the country's first analog space mission at Leh in Ladakh, where space agency will simulate life in an interplanetary habitat. • A collaborative effort by Human Spaceflight Centre, ISRO, AAKA Space Studio, University of Ladakh, IIT Bombay, and supported by Ladakh Autonomous Hill Development Council, this mission will simulate life in an interplanetary habitat to tackle the challenges of a base station beyond Earth. • It is **designed to support both physical needs and psychological well-being,** the habitat integrates a range of innovative technologies like airlock and Extra-Vehicular Activities (EVA zone), Circadian lighting system, hydroponics, environment monitoring system and stand-alone power system.

Black Hole Triple System	• A "black hole triple" system was discovered, 8,000 light years away from Earth, by researchers from Caltech and MIT.
	• The system is V404 Cygni, located within the Milky Way and around 8,000 light-years from Earth.
	• This so-called "X-ray binary" of the black hole and its victim star were previously known, and the system has been well-studied.
	• **However, a deeper investigation revealed that this binary actually sits at the heart of a triple star system.**
	• The system comprises:
	  1. **Central Black Hole (V404 Cygni)**: Nine times the mass of the Sun, consuming a nearby small star.
	  2. **Two Stars**: One orbits closely (every 6.5 days) and another orbits from a far distance (every 70,000 years).

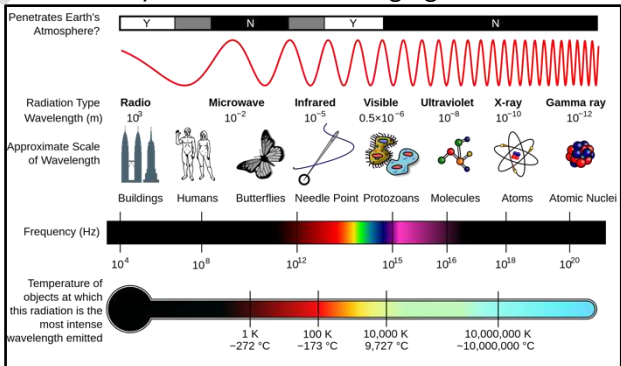|	
	• It is located in the constellation **Cygnus**.
Airships	• With climate change affecting the environment, some companies are looking at airships again as a way to transport goods. • Airships are **large, lighter-than-air aircraft that float** because they are filled with gas that's lighter than the air around them. This is similar to how helium balloons work. • Early airships used hydrogen gas because it was light and cheap, but it was also highly flammable, causing dangerous accidents like the Hindenburg disaster in 1937. • **Today, most airships use helium, which is safer but very expensive.**
New findings on Uranus	• In 1986, NASA's Voyager 2 spacecraft flew close to Uranus to collect data. During its five-day visit, Voyager 2 sent back important information that shaped how we understand this distant planet. • However, **scientists have now realized that some of the information from this visit might not be completely accurate due to unusual conditions at the time.** • **When Voyager 2 visited Uranus, it was just after a strong solar wind event, which compressed Uranus's magnetic field, or "magnetosphere," to only 20% of its usual size.** This change in the magnetosphere led to unusual observations. • **The compressed magnetosphere made scientists think that Uranus had very little plasma (a high-energy state of matter) and unusually strong electron belts.** • This new information might **help scientists discover hidden oceans under the surfaces of these moons by studying their magnetic environments.**
Solar activity and Binar Satellites	• Recently, three Australian CubeSats from Curtin University's Binar Space Program burned up in the Earth's atmosphere much sooner than expected due to increased solar activity. • The Sun's activity, governed by its magnetic cycle, affects not just the Earth but also satellites orbiting close. • Sun undergoes an **11-year solar cycle** during which its magnetic field flips. It leads to varying solar activity. • The Sun's activity will likely slow by 2026 with a solar minimum expected by 2030. • The Binarprogram, based at Curtin University focuses on advancing knowledge of the Solar System and making space operations more accessible. • <u>**Binar-2, 3 and 4**</u>:The program launched these CubeSats designed to last six months. Due to high solar activity they burned up in just two months reducing their scientific mission duration.
Proba 3 Mission	• ISRO will launch the European Space Agency's Proba-3 mission on its PSLV rocket to study the solar corona, the outermost and hottest part of the Sun's atmosphere, from Sriharikota on December 4. **Mission Type** • Advanced solar mission focusing on the Sun's corona and space weather **Orbit Details** • Highly elliptical orbit: **600 x 60,530 km**, orbital period: **19.7 hours** **Mission Duration** • Two years

	Estimated Cost
	• 200 million euros

Scientific Organisations in News

Topics	Details
Institute of Advanced Study in Science and Technology	• IASST in Guwahati, under the Department of Science & Technology, Government of India, has led extensive research into IL-35. • IASST was set up in 1979 by the Assam Science Society with the prime objective of setting up a premier research establishment in the NE region to deal with problems of the north east in particular and the country in general. • The IASST was registered as a separate entity in 1991 under the Societies Registration Act of 1860. • The Institute was later shifted to its present location near "Deeparbeel", a natural lake in western side of Guwahati, in June 2004. • The Institute has been recently taken over as an autonomous research Institute by the Government of India under the Department of Science and Technology. • IASST has four basic divisions: Material Sciences, Life Sciences, Resource Management and Environmental Sciences, Mathematical Sciences.
Indian Institute of Astrophysics (IIA)	• Scientists at IIA Bengaluru have reported the "first significant" results from the Visible Emission Line Coronagraph (VELC) payload onboard the ADITYA-L1. • The IIA, with its headquarters in Bengaluru, is an autonomous research institute wholly funded by the Department of Science and Technology, Government of India. • It was established in 1971. • IIA conducts research primarily in the areas of astronomy, astrophysics and related fields. • The institute has a network of laboratories and observatories in India.
Indian Council of Medical Research	• Aimed at encouraging Indian scientists to come up with innovative ideas for finding solutions to difficult health problems, the Indian Council of Medical Research (ICMR) has announced a new initiative called "First in the World Challenge". • It is India's top organization for guiding, coordinating, and promoting medical research. • ICMR is funded by the **Government of India**. • ICMR was originally called the **Indian Research Fund Association (IRFA)** when it was founded in 1911. After India gained independence, it was restructured and renamed as ICMR in 1949. • ICMR operates **26 national institutes** that conduct research on a range of health topics. ICMR is overseen by a **Governing Body** which is led by the Union Health Minister.
National Commission For Indian System Of Medicine (NCISM)	• **Context:** Medical Assessment & Rating Board, Indian Systems of Medicine (MARB-ISM), National Commission for Indian System of Medicine (NCISM) conducted a workshop for drafting Ayurveda Process Handbook. • The National Commission for Indian System of Medicine (Amendment) Bill, 2021

	amends the National Commission for Indian System of Medicine Act, 2020.
	 • The 2020 Act replaced the Indian Medicine Central Council Act, 1970.
	     o The 1970 Act set up the Central Council of Indian Medicine to regulate the education and practice of the Indian Medicine system.
	     o The 2020 Act replaced the Council with a National Commission for regulating education and practice of the Indian medicine system.
	 • **The National Commission was constituted on June 11, 2021 to supersede the Central Council.**
	 • **The 2021 Bill specifies that all powers and functions of the Board of Governors (as under the 1970 Act) will be deemed to have been done under the 2020 Act and will continue to remain in force.**

ICAR-NRC Equine	• ICAR-NRC Equine has achieved an international honor by being designated as a **Reference Laboratory by the World Organisation for Animal Health (WOAH).** • The **Indian Council of Agricultural Research – National Research Centre on Equines (ICAR-NRC Equine)** is a research center focused on the health and wellbeing of equines (horses, donkeys, mules, etc.). • Located in Hisar, Haryana, the center now joins a select group of laboratories recognized globally for its standards in animal disease diagnostics and research. • World Organisation for Animal Health (WOAH), **formerly the Office International des Epizooties (OIE), is an intergovernmental organisation founded in 1924, coordinating, supporting and promoting animal disease control**.

Scientific Concepts in News

Topics	Details
X Rays	• Wilhelm Conrad Röntgen's accidental discovery of X-rays on November 8, 1895, not only won him the first Nobel Prize in Physics in 1901 but also laid the groundwork for modern diagnostic medicine and radiology. • X-rays are a **type of electromagnetic radiation, falling between ultraviolet (UV) light and gamma rays on the electromagnetic spectrum.** • They have shorter wavelengths and higher frequencies than visible light, which gives them high energy. • This high energy allows X-rays to penetrate many materials, which is why they are widely used in medical imaging and material inspection.

Milimeter Waves	• C-DOT, IIT-Roorkee tie-up to develop millimeter wave transceiver for 5G rural connectivity.
	• Millimeter wave (mmWave), also known as millimeter band, is a range of electromagnetic frequencies between microwaves and infrared.
	• Its frequency spectrum is used for wireless high-speed communications.
	• It is also known as the extremely high frequency, or EHF, band by the International Telecommunication Union.
	• Communications based on this band of frequencies are fast and provide increased bandwidth, making it ideal for network carriers to provide faster service to bandwidth-intensive applications.
	• The mmWave band contains wavelengths between 10 millimeters at 30 gigahertz and 1 millimeter at 300 GHz.

6.5   TITBITS

India's First Artificial Intelligence Data Bank

- India's first Artificial Intelligence (AI) data bank was launched by the Ministry of Science and Technology. It was announced during the **7th Edition of the ASSOCHAM AI Leadership Meet 2024**.
- **An AI Data Bank refers to a centralized repository or database that stores a wide variety of structured and unstructured data that can be used to train, test and develop Artificial Intelligence (AI) models.**

Waves OTT

- Waves is a digital platform developed by Prasar Bharati. It aims to cater to India's growing demand for streaming services.

ISRO signs implementation agreement with Australian Space Agency

- ISRO has signed an **Implementation Agreement (IA)** with the Australian Space Agency (ASA) to enhance collaboration for the mission focusing on crew safety and recovery.
- Enables cooperation for search and rescue operations and recovery of crew modules in case of contingencies during the ascent phase near Australian waters.

Pravriddhi

- The Indian Institute of Science (IISc) in Bengaluru has started a special programme called **Pravriddhi**.
- It aims to bring together businesses, universities, research labs and investors to create innovative products and help India become more self-reliant.

International Pathogen Surveillance Network

- The World Health Organization (WHO) through its International Pathogen Surveillance Network (IPSN) has awarded **approximately $2 million to 10 projects under the first round of catalytic grants**.
- This initiative aims to enhance pathogen genomic surveillance capabilities particularly in low- and middle-income countries (LMICs) to better understand and mitigate disease threats.
- **The International Pathogen Surveillance Network (IPSN)** is a global network of pathogen genomic actors, brought together by the WHO Hub for Pandemic and Epidemic Intelligence, to accelerate progress in

pathogen genomics, and improve public health decision-making.

Surface Hydrokinetic Turbine (SHKT) Technology

- Central Electricity Authority (CEA) has **recognized Surface Hydrokinetic Turbine (SHKT) technology under the Hydro Category** to drive innovations and explore alternate technologies to achieve net zero emission targets and ensure sustainable development of power sector for the nation.

- **Unlike conventional hydroelectric systems that require dams or reservoirs, SHKT operates directly in natural water bodies, such as rivers, tidal streams, and ocean currents. It is an emerging technology with potential applications in sustainable energy generation.**

6.6 ADDITIONAL TOPICS FOR READING FROM IASGYAN WEBSITE

TOPIC NAME	UPLOADED ON IAS GYAN WEBSITE ON
Rare Diseases	15th October 2024
TB	28th October 2022
India TB Report 2024	29th March 2024
Traditional Medicines	17th October 2023
RNA	4th September 2024
Diabetes	23rd June 2023
Healthy Longevity Initiative	14th November 2024
Traditional Knowledge in India	17th November 2024
Six Decades of India's Space Journey and Emerging Private Space Sector	28th November 2024
Pills to Replace Injections	27th November 2024
Diseases in News: Chagas, Kfd	26th November 2024

7. CULTURE & HISTORY

7.1 ADOPT A HERITAGE PROGRAMME

Context
- Adopt a Heritage Programme has been in the news recently because of the degrading condition of the Indian heritage sites and its sporadic placement.

About Adopt a Heritage Programme
Launched in
- 27th September, 2017 (World Tourism Day)

Ministry
- Ministry of Tourism, Ministry of Culture

Other entities
- Archeological Survey of India (ASI), State/UTs government

Objective
- Sustainable upkeep of heritage sites with private and public sectors.
- Ensuring more tourism.

Aim
- Develop and maintain amenities at heritage sites

Defined under
- Ancient Monuments and Archeological Sites and Remain Act (AMASR), 1958

Monument Mitras
- Entities with the best vision for heritage sites are given an opportunity to associate it with CSR (Corporate Social Responsibilities) activities.

Adopt a Heritage 2.0
- A revamped version of the earlier scheme
- Key highlights:
  o Smaraka Sarathi: Any private entity that has been selected by ASI (earlier called Monument Mitra)
  o Utilization of CSR fund
  o Four-pronged amenities: Hygiene, Accessibility, Safety, and Knowledge.
  o Tenure of stakeholders: Initially 5 years. Extendable upto 5 years.

Benefits
- **Preservation** of culture and heritage.
- Upholding **Article 51(A)** i.e. fundamental duty.
- More **employment** generation.
- Boost to the **tourism industry.**

Challenges
- **Conflict of interest** among stakeholders.
- **Lack of legal framework** for responsibilities.
- Increased **maintenance cost.**
- Damaged sites due to **lack of expertise.**

Need for a more enlightened approach
- **Sporadic and episodic existence** of sites due to no civic involvement.
- **Less felt importance of preservation** due to no ancestral connection.
- **Extreme preservation tendencies** like keeping it as it is or over-modernizing.
- **Conflict of religious interests** considering the sites as religious symbols.
- **Complexity** induced by semi-commercial activities at the adopted site.

Way forward
- **Transparent timely auditing** of the private companies involved.
- **Legal framework** specifying the responsibilities of the stakeholder.
- **Sufficient fund supply** as well as **rational fund utilization.**
- **Engaging youths** in conservation by generating **awareness**.

Conclusion
- A more enlightened policy is needed taking into account local requirements and national ideals.

7.2   GANGA DYNASTY INSCRIPTION

Context
- Recently in **Murumanehalli** village of **Chikkamagaluru's Teguru** gram panchayat, an **899-year**-old **inscription** from the **Ganga dynasty** was discovered.

About the Ganga dynasty
Founder
- **Western Ganga**: **Kirtivarman I** (350–370 CE)
- **Eastern Ganga: AnantavarmanChodaganga** (1078–1147)

Other major rulers
- **Western Ganga**: Durvinita, Bhattaraka, Avinita, Madhava
- **Eastern Ganga:** Ananga Bhima Deva, Narasimha Deva, Bhanu Deva

Economy
- **Agriculture** dependent.
- Well-constructed **irrigation** systems, including tanks and canals.
- **Trade relations** within and outside their territories.
- Gold, silver, and copper coins with various denominations were minted.
- Flourished crafts and guilds which produced textiles, metalworks, pottery etc.

Revenue Policy
- A percentage of the **agricultural produce** depending on the **crop type** and **land fertility**.

Administration
- **Hereditary monarchy** with **feudal** system.

Society
- Respectable position for women.
- **Devadasi** system in temples.
- Strictly regulated **education** system with classes on archery, medicine, etc.
- Intercast marriage and child marriage were permitted.

Architecture
- Influence of Indigenous Jain elements and **Pallava** and **Badami Chalukya** features.
- The **Gomateshwara** monolith of Karnataka is a classic example.

7.3   SHORT ARTICLES

Bob Khathing Museum

Context
- Recently Defence Minister Rajnath Singh inaugurated the Major Ralengnao 'Bob' Khathing Museum of Valour at Tawang in Arunachal Pradesh and a statue of Sardar Patel on National Unity Day (Patel's birth anniversary).

About Bob Khathing
Birth
- 1912 in **Manipur's Ukhrul** district in Tangkhul Naga community

Founder
- A school at **Harisanga**in Assam's Darrang district.

Positions held
- **Emergency Commission officer** of the Indian Army in 1939
- **Minister in charge of the hill areas** of the interim government.
- Member of **Assam Rifles** in 1949
- Assistant political officer at **Indian Frontier Administrative Service** in 1951
- **Ambassador to Burma** in 1975

Awards

- **Member of British Empire (MBE)** for galvanising Naga support against the Japanese
- **Military Cross (MC)** for his bravery.

Major contribution

- Leading the expedition to peacefully **integrate Tawang into India.**
- Established **essential military and security frameworks** like Sashastra Seema Bal.

Death

- 1990 in **Imphal**

About Tawang

- Lies on NH-13 section of the Trans-Arunachal Highway.
- Tawang Tract is now divided into the Tawang district and the West Kameng.
- Removing the Tibetan administration, **India occupied Tawang in 1951.**
- It lies to the north of the **Tawang Chu river valley,** at the south of the **Line of Actual Control with China.**
- Inhabited by **Monpa people,** it is the site of a famous **Gelugpa Buddhist Monastery.**

Arya Samaj

Context

- Recently the PM paid tribute to the Arya Samaj Monument in Georgetown, Guyana.

About Arya Samaj:

Foundation

- on April 10, 1875, in **Bombay** (now Mumbai) by **Swami Dayanand Saraswati**

Aim

- Return to the original teachings of the Vedas

10 guiding principles

- God is the primary source of all true knowledge; God is alone worthy of worship; Vedas provide true knowledge; Always accept truth and abandon untruth; All actions should be guided by dharma; Promote material, spiritual and social well-being; Treat everyone with love and justice; Dispel ignorance and increase knowledge; Own progress depends on the upliftment of others; Social well being over individual well being.

Social idea

- Fatherhood of God and Brotherhood of man, Gender equality, Absolute justice, Intercast marriages, Widow remarriages

Contributions

- **Education:** Dayanand Anglo Vedic (DAV) College Trust, Gurukul Kangri University, Girls' schools
- **Religious:** monotheism, rationalism, ethical behaviour, reconversion to Hinduism
- **Political and Social:** Promoting religious nationalism and Swaraj

Split

- **Over food habits:** Mahatma group (Vegetarian) and Cultured party (Non-vegetarian)
- **Over education:** Gurukul faction (traditional Vedic sanskrit education) and College faction (modern english education)

Jagannath Temple

Context

- Recently Odisha's Law minister clarified that there was no secret chamber inside the treasury of the Jagannath Temple in Puri.

About Jagannath Puri temple

- A 12th-century **Vaishnav** temple dedicated to **Lord Jagannath** (incarnation of Lord Vishnu) along with his brother **Balabhadra** and sister **Subhadra**.
- Built by **Ananta Varman Chodaganga Deva** of the **Ganga dynasty**.
- It is an example of **Kalinga Architecture**.
- **4 gates with 4 beliefs:**
    - **Singhadwara/Lion's gate:** Liberation from birth cycle
    - **Hastidwara/Elephant's gate:** Financial well being
    - **Aswadwara/Horse's gate:** Shed lust
    - **Vyaghrdwara/Tiger's gate:** Right behaviour
- It is one of the **Chardhams** and a part of the **Golden Triangle** of Odisha.
- It is famous for its Chariot festival called **Ratha Yatra**.

Muziris

Context

- Recently the sixth edition of the Kochi-Muziris Biennale (KMB) was announced to be started in December 2025.

About Muziris

What?
- Ancient harbour and urban centre

Location
- Malabar coast

Historical mentions
- Periplus of the Erythrean Sea
- Bardic Tamil poems
- In Pliny the Elder's Natural History as the first emporium of India

Dynasty ruled
- Chera

Trading port for
- South India and Persia, Middle East, North Africa, (Greek and Roman) Mediterranean region

Export
- Spices, semi-precious stones, pearls, diamonds, ivory, Chinese silk, tortoise shells, etc.

Import
- Gold coins, peridots, multicoloured textiles,

copper, tin, coral, raw glass, wine, etc.

Recent findings

- It was first occupied by the indigenous and 'Megalithic' (Iron Age) people.
- A continuous inflow of traders exemplified multicultural mixing in South India

7.4 SNIPPETS

Topics	Details
Kalka-Shimla heritage rail track	• Recently, Himachal Pradesh Chief Minister urged the centre to explore the possibility of running trains on the Kalka-Shimla railway on green hydrogen • **Narrow gauge**, single track or **toy train track** railway. • **UNESCO World Heritage site** as part of the **Mountain Railways of India.** • Holds the **Guinness Book of World Records for its 96-kilometre steepest rise in altitude**. • Passes through the **world's highest multi-arch gallery bridge at Kanoh** and the **world's longest tunnel at Barog (at the time of construction).**
Places of Worship Act, 1991	• Recently, a district court in Sambhal ordered a survey of the Shahi Jama Masjid as demanded by a petition bringing the POWA into the limelight again. • According to the act, the religious character of a place of worship must remain the same as it was on August 15, 1947, and all pending legal proceedings regarding the conversions as of August 15, 1947, was to be terminated, barring any further conversion. • The law is being challenged on the grounds that it bars judicial review. • The cutoff date is being challenged as irrational. • It is also challenged as it abridges the right of the religions to claim the disputed religious sites.
Musical Instruments	• Recently, Sarangi giant **Pandit Ram Narayan**, who gave the humble, demanding instrument a classical stature, **passed away at 96.** **About Indian Musical Instruments:** **Sarangi** • Long neck, resonant gourd body, and sympathetic strings. • Used in classical music, particularly in North India. **Sitar** • Long neck, resonant gourd body, and sympathetic strings. • Used in classical music, particularly in North India. **Veena** • Ancient and traditional string instrument. • Example: Saraswati veena and Rudra veena. • Used in the Carnatic music of South India. **Sarod** • Fretless, plucked string instrument. • Used in North Indian classical music. **Tanpura** • Long-necked, plucked instrument.

	• Used in Indian classical music.
Bodo Culture	• Recently on November 15th, PM inaugurated the **1st Bodoland Mohotsav** on **language**, **literature**, and **culture** to sustain **peace** and build a **Vibrant Bodo Society** with the theme 'Peace and Harmony for Prosperous Bharat'. **About Bodo culture:** **Who?** • Largest community (part of Bodo-Kachari) among Scheduled Tribes of Assam **Occupation** • Primarily rice cultivators. • Fishery, poultry, piggery, jute cultivation, betel nut plantation **Famous drink** • Fermented rice drink-Zu Mai **Primary festival** • Baishagu **Traditional dance** • Bagurumba **Religion** • Bathouism, Boro Brahma Dharma, Shaivism, Christianity **Language** • Bodo (listed in the 8th schedule of the constitution) **Bodoland Movement** • Earlier, these tribes were isolated from the rest of India, which led to a weak economy and high illiteracy rates. This triggered the movement, led by Upendra Nath Brahma
Asian Buddhist Summit	• President Murmu inaugurated the first Asian Buddhist Summit (ABS) organised by the Union Culture Ministry and the International Buddhist Confederation (IBC). **About Asian Buddhist Summit:** **Origin** • By the Ministry of Culture and IBC (International Buddhist Confederation) **2024 Theme** • Role of Buddha Dhamma in Strengthening Asia **Aim** • Promoting cultural unity by strengthening ties on the line of Buddhism across Asia • Spiritual development through promoting values of Buddha-like mindfulness and yoga. • Encouraging Buddhist pilgrimage tourism to support the local economy and boost the tourism industry.

Historial Sites and Monuments in news

Topics	Details
Bidar Fort	• The **Karnataka Board of Waqfs** has identified **17 monuments** inside the **Bidar Fort** as its property. • **Location:** Bidar city of Northern Karnataka • **Origin:** Back to 500 years, starting with the Western Chalukya dynasty • **Built by:** Sultan Ala-Ud-Din Bahman and renovated by Sultan Ahmed Shah Wali of the Bahmanidynasty as he shifted his capital from Gulbarga to Bidar in 1430 • **Materials used:** Trap rock. Also stone and mortar used in the walls • **Includes:** Islamic and Persian architecture, 7 main entrances, 37 bastions (Balcony like structures), Mosques and mahals, more than 30 Islamic monuments • **Dynasties:** Bahmani, Bijapur Sultanate, Mughal, and the Asaf Jahi

Menhir	• An **Iron Age** menhir, a memorial pillar locally known as '**Niluvu Rayi**' found in **Kamasanpalli village of Nagarkurnool district in Telangana** faces neglect.
	• Menhirs are small or gigantic **megalithic memorial pillars** planted **vertically** on the ground near burial sites.
	• **Facts about Kamasanpalli menhir:**
	  ○ **Origin:** Around 1500 BCE
	  ○ **Place:** In an agricultural field near Dindi River (a tributary of river Krishna)
	  ○ **Risk:** Leaning due to agricultural activities

Ajmer Dargah	• Court order for **survey** of **Ajmer Dargah** based on a **petition** claiming it to be plotted on the land of an ancient **Lord Shiva temple**
	• Its a **Sufi Tomb** (dargah) of **Khwaja Moinuddin Hasan Chishti**
	• **Location:** At the foot of Taragarh hill in Ajmer, Rajasthan
	• **Akbar** reconstructed its **sanctum sanctorum** in **1579** and renovated by **Jahangir, Shah Jahan, and Jahanara**
	• An example of the **Indo-Islamic architecture.**
	• The white marble dome has a lotus and a crown of gold, donated by **Nawab Haider Ali Khan.**
	• **Materials used:** marble, brick and sandstone
	• **Eight tombs of his family members** besides that of Chishti
	• **About Moinuddin Chisti:**
	  ○ **13th-century Sufi saint and philosopher**
	  ○ Born in **Sanjar** (of modern-day **Iran**), or **Sijistan**
	  ○ His death anniversary is called the **Urs Sharif festival**

Sambhal Mosque	• The court ordered a survey of the Shahi Jama Masjid as demanded by a petition leading to an eruption of violence • The Petition claimed that the 16th-century masjid was built on the land of the ancient **Hari Har Mandir.** • **Hindus claim:** 10th incarnation of lord Vishnu i.e., Kalki will take birth here. • **Similar claims:**Gyanvapi and Eidgah masjid of Uttarpradesh, Kamal-Maula masjid of Madhya Pradesh, Ajmer Dargah of Rajasthan • **About Jama Masjid:** ○ Important example of the **Mughal architecture.**

	o built during **Babur** by **Mir Hindu Beg** around **1528** o "**protected monument**", notified under the **Ancient Monuments Preservation Act, 1904** o **Monument of National importance** on the website of the ASI in the list of centrally protected monuments. o **Features**: a large square mihrab hall with a dome, flanked by arches.

Festivals in News

Topics	Details
Malawi Festival	• **Cultural exchange** within the **Dzaleka Refugee Camp in Malawi** (a southeastern African country). • Got **Cultures of Resistance Award (CoR Award) in 2024** • The only festival of its kind in the world that is held within a refugee camp
Chakkouba Festival	• Married sisters visit maternal homes for a **grand feast** on the invitation of the brother. • **One of the biggest festivals in Manipur** and the **biggest festival of the Meitei** community
Chhath Puja	• A **four-day** elaborate celebration in honour of the **Sun god** and his sister '**Chhathi Maiya**'. • Historical evidence was found in Rig Veda, Ramayana and Mahabharata. • The four days are: Nahay Khay (holy bath and simple meal), Kharna (full day fast), Sandhya Arghya (offerings to the setting sun), Usha Arghya (offerings to the rising sun)
Maha Kumbh	• World's **largest peaceful gathering** where pilgrims take a dip in sacred rivers. • **Held at 4 places**: Haridwar (Ganga), Ujjain (Shipra), Nashik (Godavari), Prayagraj (confluence of Ganga, Yamuna, Saraswati) • **Types of Kumbh**: o **Kumbh Mela**- 4 times in a 12 year period o **Ardh Kumbh**- every 6th year at Haridwar and Prayagraj o **Maha Kumbh Mela**- after every 144 years at Prayag o **Maagh Kumbh**- Every year in the 'maagh' month • **UNESCO**: Intangible Cultural Heritage of Humanity

Dances in News

Topics	Details
Yakshagana	• Tulasi Raghavendra Hegde, a 5-year-old girl, brings the traditional Indian dance-drama Yakshagana into the limelight. • 16th-century traditional dance-drama of Karnataka featuring music, dialogue, and elaborate costumes • Language: Kannada, Malayalam, Tulu • Topics: Ramayana, Mahabharata, Bhagavata, other hindu and jain epics • Instruments: Cheda, Maddalam, Jagatta, Elathalam, etc.

	• Historically performed by the Jakkula Varu community in the courts of the Vijayanagar dynasty • Geographical division: Moodalopaya (eastern parts of Karnataka) and Paduvlopaya (Western parts of Karnataka with further division of Tenkutittu, Badagutittu, Badabadagutittu)

Maori Haka	• MPs in New Zealand's parliament performed it to protest against a bill.
	• Traditional Maori ceremonial dance which embodies cultural pride, strength, and unity
	• Purpose of performance:
	  o Historically warriors before going to battle
	  o Welcoming guests
	  o Storytelling
	  o Victory celebration
	  o Honouring ancestors
	• Performance includes: chanting, facial expressions, hand movements, foot stamping
	• Used in: political protests, honoring Maori rights, social justice
	• Different types:
	  o Peruperu: to intimidate enemies in war
	  o Ngeri: to boost morale
	  o Powhiri: to welcome in ceremonies
	  o Manawa Wera: to express grief at funerals

7.5   ADDITIONAL TOPICS FOR READING FROM IASGYAN WEBSITE

TOPIC NAME	UPLOADED ON IAS GYAN WEBSITE ON
Buddhism	7th October, 2024
National Press Day	19th November, 2024
Menhir	12th November, 2024
Bidar Fort	9th November, 2024
Maori tribe	22nd November, 2024
Booker Prize	14th, November, 2024
Ustad Bismillah Khan Yuva Puruskar	25th, November, 2024
Guru Tegh Bahadur Shaheedi Divas	24th, November, 2024
Megalithic period	25th, November, 2024
Portuguese conquered Goa	27th, November, 2024
Miniature Paintings in India	20th, November, 2024
Temple Architecture	22nd, January, 2024

8. GEOGRAPHY AND DISASTER MANAGEMENT

8.1   GLACIAL LAKES IN HIMALAYAN REGION

Context

- The Central Water Commission's (CWC) report, states that with a 33.7% expansion of the surface area, the lakes in India experienced an even more substantial rise.

Details

- A recent government report indicates that glacial lakes and water bodies in the Himalayan region **have experienced a 10.81% increase in area from 2011 to 2024,** driven by climate change. This expansion raises concerns about the heightened risk of glacial lake outburst floods (GLOFs).

Key Findings with Recommendations and Implications

- **Glacial Lake Expansion:** India's glacial lakes grew by 33.7% from 2011 to 2024, with 67 lakes seeing over 40% increase, indicating high GLOF risk.
- **Regional Variations:** Significant lake expansion was observed in Ladakh, Himachal Pradesh, Uttarakhand, Sikkim, and Arunachal Pradesh.
- **Climate Change Impacts:** Melting glaciers and expanding lakes reflect the warming effects of climate change, threatening ecosystems and communities.
- **GLOF Risks:** Breaches of natural moraine dams can trigger catastrophic Glacial Lake Outburst Floods (GLOFs).
- **Monitoring Advancements:** Satellite technologies like Sentinel 1 SAR and Sentinel 2 provide precise lake size data with 10-meter accuracy.
- **Transboundary and Water Risks:** Glacial lake expansion poses cross-border risks, with potential impacts on water availability in the Ganga, Brahmaputra, and Indus river systems.

Causes of Expanding Glacial Lakes in Himalayas

- **Global Warming:** Climate warming is affecting the hydrological regimes in the HKH regions, because of factors like changes in seasonal extremes, increased evapotranspiration, and changes in glacier volume.
- **Retreating Glaciers-** Studies conducted by the Indian Space Research Organization (ISRO) show that approximately 75 percent of the Himalayan glaciers are retreating at an alarming rate. Receding glaciers would also have an impact on the rates of groundwater recharge in some areas.
- **Weakening Moraines-** A moraine is any accumulation of unconsolidated debris (regolith and rock), sometimes referred to as glacial till, that occurs in both currently and formerly glaciated regions.
- **Human Activities-** With regional populations dependent on these rivers for their livelihoods, the changes induced by glacial lake expansion could have far-reaching socioeconomic and environmental consequences.

The Central Water Commission (CWC), established in 1945, advises the Government of India on water resources management. Operating under the Ministry of Jal Shakti, it plans and implements schemes for water conservation, flood control, irrigation, navigation, drinking water, and hydropower generation.

Way Forward

- It's essential to reduce greenhouse gas emissions to address glacial melt and retreat. Early warning systems for monitoring glacial lakes and weather can aid at-risk communities. Engineering measures stabilize glacial lakes while restoring natural ecosystems like wetlands and forests help regulate water flow, conserve habitats, and sequester carbon.

8.2   ARTIFICIAL RAIN

Context

- Delhi Environment Minister requested the Centre's approval for artificial rain to combat the city's 'severe plus' air quality.

What is cloud seeding?

- Cloud seeding is an **artificial way of inducing moisture in the clouds** to cause rainfall. It is a form of weather modification**.** It is a technique used to **modify weather by releasing silver iodide (AgI)** into the atmosphere to facilitate the formation of **ice crystals, enhancing the cloud's ability to generate rain**. Silver iodide aids in the creation of ice nuclei in clouds, which are necessary for artificial rain to occur.

Condition Required for Cloud Seeding

- Right atmospheric conditions with plenty of clouds that are capable of rain is required for cloud seeding. Clouds form from the condensation of **invisible water vapor on nuclei from dust, pollen and salt from ocean spray.** Cloud seeding increases the number of these available nuclei. Raindrops or ice crystals might not form without these added nuclei.

Cloud seeding can be categorized into two types

- **Hygroscopic Cloud Seeding:** This method accelerates the merging of droplets in liquid clouds, creating larger droplets that eventually lead to precipitation. Salt particles are generally released at the cloud's base.
- **Glaciogenic Cloud Seeding:** This technique induces ice formation in super cooled clouds by dispersing efficient ice nuclei like silver iodide or dry ice, which triggers ice nucleation and subsequent precipitation.

Where was it used previously?

- Cloud-seeding has not yet been implemented in India as a method to improve air quality. **While IIT Kanpur had planned to experiment last year, it has been conducting test runs along the Western Ghats since 2018**, though the impact on air quality has not been evaluated.
- **In December 2023, cloud-seeding was carried out in Lahore, Pakistan**, which led to an improvement in the Air Quality Index (AQI) from 300 ("poor") to 189 ("moderate").

Advantages of Cloud Seeding	Disadvantages of Cloud Seeding
Creates rain	Uses chemicals that can harm the environment, especially plants and animals. While silver iodide is not currently known to harm health, future research may alter this understanding.
Regulates water vapor to prevent damage from destructive hail and storms.	The technique is mostly applied to clouds showing early signs of rainfall, so its actual effectiveness in causing rain remains uncertain. It is very expensive.
Helps save dry places from drought.	Modifies the weather, which might change climatic patterns.

Conclusion

- Establishing clear regulatory frameworks and governance mechanisms are essential to address the ethical, legal, and environmental concerns associated with cloud seeding and cloud seeding experiments. These frameworks should balance the drive for innovation with the need to protect ecosystems and communities.

8.3   CORALS IN CRISES

Context

- The latest global assessment by the **International Union for Conservation of Nature (IUCN)** has revealed a concerning statistic related to coral reefs.

Key Details

- **Current Risk to Reef-Building Corals:** 44% of reef-building coral species are at risk of extinction as per the latest IUCN assessment.
- **Previous Risk (2008):** 33% of reef-building coral species were at risk of extinction.
- **Primary Threat:** Climate change is identified as the largest threat to coral species.
- **Other Threats:** Pollution, agricultural runoff, disease, and unsustainable fishing.
- **Data Sources:** IUCN assessments used data from the Global Coral Reef Monitoring Network and IPCC reports.
- **Number of Coral Species Assessed:** 892 species of warm-water reef-building corals were assessed.

Vulnerability Categories

- Coral reefs, vital for marine biodiversity, coastal protection, and economic value ($375 billion annually), face significant threats. With 67% of species endangered, recent bleaching events have impacted 80% of reefs. Urgent action is needed, including funding and emissions reduction, with the 2025 UN Ocean Conference as a key milestone.

What are Corals?

- Corals are marine animals related to jellyfish and anemones. Coral polyps form protective limestone skeletons called calicles, which build coral reefs over time. Polyps divide into clones, creating colonies that grow into expansive reefs. Soft corals, unlike reef-builders, resemble bushes and trees but do not form reefs.

Current Status of Corals

- **According to the Global Coral Reef Monitoring Network (GCRMN)Status of Coral Reefs of the World**: 2020 report, there has been a steady decrease in hard coral cover since 2010. The worst impacts have occurred in South Asia, Australia, the Pacific, East Asia, the Western Indian Ocean, The Gulf and Gulf of Oman.
- Coral reefs across the world face significant threats, with Southeast Asia's reefs being the most vulnerable, primarily due to fishing. The Atlantic and Indian Ocean regions also suffer from over 75% and 65% threats, respectively, while Australia's reefs are the least threatened, with only 14% at risk.
- The **National Oceanic and Atmospheric Administration** coral reef authority declared the global bleaching event in April 2024, making it the fourth of its kind since 1998. The previous record from the 2014 to 2017 mass bleaching affected just below 66 percent of the world's reef area.

Threats

- **Physical Damage**: Coastal development, dredging, quarrying, destructive fishing, boat anchors, and recreational misuse can physically damage coral reefs, affecting their growth and survival.

- **Land-based Pollution:** Sedimentation from urban runoff, agriculture, and coastal development smothers corals, while excess nutrients from fertilizers, sewage, and animal waste promote harmful algal growth, disrupting coral ecosystems.
- **Pathogens and Toxins:** Pollution from inadequately treated sewage, stormwater, and industrial discharges introduces pathogens and toxic substances, such as metals, pesticides, and chemicals, harming coral health and reproduction.
- **Trash and Microplastics:** Marine debris, including plastics and microplastics, entangles corals, blocks sunlight, and introduces toxins, harming marine life that consumes them.
- **Overfishing and Coral Harvesting:** Overfishing disrupts coral reef ecosystems by reducing natural predators and grazing fish, while blast fishing and coral harvesting lead to direct destruction and reduced biodiversity.

Impacts

- Pollution, overfishing, destructive fishing practices using dynamite or cyanide, collecting live corals for the aquarium market, mining coral for building materials, and a warming climate are some of the many ways that people damage reefs all around the world every day.

- Increased greenhouse gases from activities like deforestation, and the burning of fossil fuels for heat and energy, cause ocean temperatures to rise, change storm patterns, and contribute to sea level rise. These changes lead to more coral bleaching events, increased storm destruction, and more.

Solutions

- To protect coral reefs, we must reduce, reuse, and recycle waste, minimize fertilizer use, conserve water, and prevent sewage pollution. Expanding marine protected areas, addressing global warming, using reef-safe sunscreens, reducing carbon footprints, and supporting eco-friendly alternatives are crucial. Policy action is vital for long-term preservation.

About the International Union for Conservation of Nature (IUCN)

- Founded in **1948** in **Fontainebleau, France**, the **IUCN** unites over **1,400 government and civil society organizations** to promote global conservation. It provides scientific tools, focuses on sustainable management of flora and fauna, and created the **IUCN Red List of Threatened Species (1964)**. The IUCN has shaped key conventions like **Ramsar**, **CITES**, **World Heritage**, and **Biodiversity**.

8.4   AGRIVOLTAIC FARMING

Context

- The 7th Session of the International Solar Alliance (ISA), held in New Delhi from November 3 to 6, 2024, focused on accelerating solar energy deployment across its Member Countries, particularly in regions with limited energy access.

About Agrivoltaic farming

- A practice **known as agrisolar or dual-use solar involves growing crops beneath solar panels**, effectively utilizing land for both

agriculture and solar energy generation. Solar panels in this setup are **positioned 2–3 meters off the ground and angled at 30 degrees** to optimize energy capture while allowing adequate space and conditions for plant growth.

Where is Agrivoltaic farming already in use?

- **Researchers in South Korea** have been growing broccoli underneath photovoltaic panels.

- The panels are positioned 2-3 metres off the ground and sit at an angle of 30 degrees, providing shade and offering crops protection from the weather.
- For example, **An Agrivoltaic farming project in Kenya** is using solar panels held several metres off the ground, with gaps in between them.

> Agrivoltaic farming is the use of land for both agriculture and solar photovoltaic energy generation. It is also referred to as **Agricola, which is a dual-use, low-impact solar**. Solar grazing is a variation where livestock graze in and around solar panels.

Working in Agrivoltaic Farming

- Elevated solar panels allow crops to grow underneath by optimizing light and air circulation. Their angle and spacing enhance both solar energy production and crop growth. The setup provides shade, conserves water, and integrates with greenhouses, enabling dual harvesting for improved land productivity and resource efficiency.

Challenges of Agrivoltaic Farm

- <u>High Initial Costs</u>: Solar panel installation is expensive due to high capital costs, reliance on imported materials, and high interest rates on loans, making widespread adoption challenging in India.
- <u>Solar Panel Degradation:</u> Solar systems degrade at a rate of 0.5% per year, with significant performance declines (up to 28%) observed in Indian conditions despite international standards.

- **Microclimatic Effects on Crops:** Changes in microclimate, such as reduced solar radiation and temperature fluctuations under APV (Agrivoltaic) systems, can impact crop growth, irrigation, and water availability.
- <u>Field Management Challenges</u>: APV systems require modifications to accommodate agricultural machinery, with sufficient overhead clearance (4-5 meters) needed for large equipment and proper spacing for planting and operation.
- <u>Technical Barriers:</u> Lack of specialized solar panels and infrastructure for agrivoltaic systems, such as lightweight modules and transparent back-sheets, hinders their adoption for agriculture.

Benefits of Agrivoltaic Farm

- Agrovoltaics maximizes land use by combining agriculture and solar energy, enhancing climate resilience through shade and water conservation. It supports renewable energy generation, boosts food security, and provides economic benefits by diversifying farmers' income through crop production and solar power, addressing energy and food demands.

Conclusion

- The adoption of agrivoltaics in India is in its incipient stage. Lack of a policy framework and land use conflicts need to be addressed. The government of India has taken numerous enterprises to encounter these challenges. Several state governments in India have also launched their own enterprises to promote agrivoltaics.

8.5   INTEGRATED FARMING SYSTEM

Context

- Farmers in Maharashtra are adopting integrated farming practices for better profits.

What is an Integrated Farming System?

- An integrated farming system is a **sustainable agricultural system** that integrates livestock, crop production, fish, poultry, tree crops, plantation crops, and other systems that benefit each other. It is based on the <u>concept that 'there is no waste' and 'waste is only a misplaced resource'</u> which means waste from one component becomes an input for another part of the system. The IFS approach is considered to be the most powerful tool for **enhancing the profitability of farming systems** especially for small and marginal farmers to make them bountiful.

Goals of Integrated Farming System

- Enhancing productivity per unit area
- Proper waste management
- Generation of continuous income round the year
- Reducing use of chemicals
- Maximization of yield of all component enterprises
- Soil health management

Components of IFS

- <u>**Crops and Livestock Components**</u>: Includes monocrop, mixed/intercrop, multi-tier crops (cereals, legumes, oilseeds), and livestock (milch cows, goats, sheep, poultry, bees).
- <u>**Tree Components:**</u> Involves timber, fuel, fodder, and fruit trees for diverse agricultural use.
- <u>**Considerations for Rainfed Areas**</u>: Selection of crops and livestock should account for soil types, rainfall patterns, growing season length, and farmers' resources.
- <u>**Suitable Livestock and Birds:**</u> Goats, sheep, white and black cattle, poultry, pigeon, rabbit, and quail are ideal for rainfed conditions.
- <u>**Agronomic Approaches for IFS**</u>: Focus on improved cropping systems, selection of suitable grain and tree species, and preservation of fodder for lean seasons.

Advantages of Integrated Farming System

- Higher **food production** to equate the demand of the exploding population of our nation.
- **Increased farm income** through proper residue recycling and allied components.
- **Sustainable soil fertility** and productivity through

organic waste recycling.

- **Integration of allied activities** will result in the availability of nutritious food enriched with protein, carbohydrate, fat, minerals and vitamins.
- Integrated farming will help in **environmental protection** through effective recycling of waste from animal activities like **piggery, poultry and pigeon rearing.**
- **Reduced production cost of components** through input recycling from the byproducts of allied enterprises.

Challenges in adoption of Integrated Farming System (IFS)

- The challenges faced in sustainable farming include limited knowledge of farming systems, unavailability of models, poor credit access, lack of marketing information, inadequate storage, weak extension services, delayed input supply, and insufficient education, especially among rural youth, hindering the adoption of efficient agricultural practices.

Government Schemes for Promotion of Integrated Farming System

National Mission for Sustainable Agriculture (NMSA)

- Launched by the Ministry of Agriculture and Farmers Welfare, NMSA aims to promote sustainable agriculture practices, including integrated farming systems, through financial assistance, training, and capacity building.

Rashtriya Krishi Vikas Yojana (RKVY)

- This centrally sponsored scheme provides financial support to states for promoting integrated farming, value addition, and infrastructure development in agriculture.

Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)

- PMKSY aims to improve water use efficiency in agriculture and promote integrated farming practices by supporting the development of water resources, micro-irrigation, and watershed management.
- The market for **integrated farming in India** is anticipated to expand at a compound annual growth rate (CAGR) of around 8% throughout the period under consideration (2022-2027).

Steps to be taken for adoption of the Integrated Farming System

- The need for adaptive research to develop an efficient IFS model.
- The provision of training to technicians, extension workers, and farm engineers to support and sustain farming systems.
- The availability of adequate banking facilities and loans, with a priority for small and marginal farmers.
- The provision of assured marketing facilities, particularly for perishable commodities.

Conclusion

- **Integrated Farming System is a promising approach** for increasing productivity and profitability through recycling the farm by-products and **efficient utilization of available resources**. Further, it generates employment opportunities to farming communities around the year and provides better economic and nutritional security. It also **maintains environmental quality** and **ecological stability**.

8.6 BETWEEN HOPE AND HURDLES ON THE HIGH SEAS

Context

- India's signing of the Biodiversity Beyond National Jurisdiction (BBNJ) Agreement has earned praise but also drawn scepticism on account of structural complexities and challenges.

Detail

- India's recent signing of the Biodiversity Beyond National Jurisdiction (BBNJ) Agreement — better known as the High Seas Treaty.

About the High Seas Treaty

- The **High Seas Treaty or the Biodiversity Beyond National Jurisdiction (BBNJ) Agreement** depicts a remarkable achievement in the continuous efforts to protect marine biodiversity and enhance the global governance of the oceans.

The BBNJ Treaty seeks to address these four issues:

- Marine genetic resources, including the fair and equitable sharing of benefits
- Measures, such as area-based management tools, including Marine Protected Areas
- Environmental impact assessments
- Capacity-building and the transfer of marine technology

- Moreover, the **BBNJ Treaty aligns with global biodiversity goals**, such as the commitment to protect 30% of the world's land, **inland waters and sea by 2030**, set during the **Kunming-Montreal Global Biodiversity Framework meeting in 2022**.

Opportunities for India

- **Strategic Reach Expansion:** India's involvement in the BBNJ Agreement strengthens its role in international maritime governance beyond its Exclusive Economic Zone (EEZ).
- **Marine Resource Conservation:** Scientific collaboration through the agreement aids in conserving India's marine resources, aligning with sustainable development goals.
- **Advancement in Marine Science:** Provides India access to essential knowledge and opportunities for technological advancements to address environmental challenges.
- **Economic Growth Potential:** Participation opens opportunities in ecotourism, sustainable fishing, and bio-prospecting in high seas Marine Protected Areas (MPAs).
- **Multilateralism in Ocean Governance:** Enhances India's international profile, supports multilateralism, and promotes sustainable practices and innovation in ocean governance.

Challenges for India

- **Slow Ratification Process:** The need for 60 countries' ratification creates delays, with geopolitical issues like maritime disputes hindering progress.
- **Economic vs. Environmental Balance:** India faces the challenge of balancing economic interests, such as fishing and seabed mining, with marine conservation efforts.
- **Capacity Building & Technology Transfer:** Ensuring effective technology transfer and investing in research, monitoring, and enforcement capacities are crucial for India.
- **Marine Genetic Resources (MGR):** India needs to regulate access to marine genetic material, balancing equitable use with global demands for biotechnology.
- **Monitoring and Enforcement:** Strengthening surveillance systems and international cooperation is essential to combat illegal fishing and enforce regulations on the high seas.

Way forward

- A cohesive maritime governance framework is needed to address structural and political gaps in the High Seas Treaty, integrating high-seas and coastal regulations.
- Coastal states, particularly in the Global South, require incentives and support from wealthier nations to align domestic laws with international standards.
- A collective political commitment is crucial to ensure the treaty's objectives, including consensus on MPAs, marine genetic resources, and enforceable compliance mechanisms.
- Without these efforts, the BBNJ could fail to effectively address global ocean challenges.

8.7   CORE COLD WAVE ZONE

Context

- The National Programme on Climate Change and Human Health (NPCCHH) has put Telangana among 17 States and Union Territories in the 'Core Cold Wave Zone'.

About Cold Wave

- A rapid fall in temperature within 24 hours requiring increased protection to agriculture, industry, commerce, and social activities.

Season

- From November to March, with extreme cold events typically occurring in December and January.

Vulnerable Groups

- Homeless individuals, elderly people, economically disadvantaged individuals, pregnant and lactating women, children, outdoor workers, farmers, and managers of night shelters.

IMD Cold Wave Standards:

- For plains: Minimum temperature ≤10°C.
- For hilly regions: Minimum temperature ≤0°C.
- **Health Issues**: Hypothermia: Caused by prolonged exposure to very low temperatures.
- **Frostbite:** Skin and tissue damage due to freezing.
- **Non-freezing Cold Injuries:** Conditions like Immersion Foot from prolonged cold and wet exposure. Fatalities can occur in severe cases without precautions.

8.8   SNIPPETS

Topics	Details
Titanium	Titanium is a metal that is the fourth most abundant element in the Earth's crust, following aluminium, iron, and magnesium. It has similar strength to steel but is about half the weight. It naturally occurs as oxides like ilmenite and rutile.
Totos	Totos, one of the smallest tribes in the world, lives in Totopara off West Bengal but are fighting for identity and suffering from infrastructure woes. Classified as a "vanishing tribe" and listed as a Particularly Vulnerable Tribal Group (PVTG).
Subansiri Lower Hydroelectric Project	**It** is a trans-Himalayan River and a tributary of the Brahmaputra River that flows through Tibet's Lhuntse County in the Shannan Prefecture in Southwestern China, and the Indian states of Arunachal Pradesh and Assam. It is the largest tributary of the Brahmaputra.
Gotti koya	It a multi-racial and multi-lingual community, is found in Telangana, Andhra Pradesh, Chhattisgarh, and Odisha. They speak Koya, a Dravidian language influenced by Telugu, and practice shifting cultivation (Podu), animal husbandry, and forest-based livelihoods. Their major festival is Sammakka Saralamma Jatra, held biennially in Warangal.
Sumi Naga tribe	The Sumis, a prominent Naga tribe in central and southern Nagaland, are known for widespread settlements and a tradition of village establishment. Formerly headhunters, they embraced Christianity with missionary influence. Their language belongs to the Tibeto-Burman family. The Ahuna and Tuluni festivals celebrate post-harvest.
Tsunami ready	The Intergovernmental Oceanographic Commission (IOC) of UNESCO runs the Tsunami Ready Programme, a voluntary, performance-based initiative to build resilient coastal communities through preparedness, assessment, and response strategies. Communities meeting all 12 indicators are certified as "Tsunami Ready,".
Kariba dam	Lake Kariba is the world's largest artificial lake and reservoir by volume. It lies 1,300 kilometres upstream from the mouth of the Zambezi River on the Indian Ocean, along the border between Zambia and Zimbabwe. Lake Kariba was filled between 1958 and 1963 following the completion of the Kariba Dam at its northeastern end, flooding the Kariba Gorge on the Zambezi River.
Mali	A landlocked country in West Africa, bordered by Algeria, Niger, Burkina Faso, Ivory Coast, Guinea, Senegal, and Mauritania. It is the **8th largest country in Africa.**
Senegal	It is located in West Africa, bordered by the Atlantic Ocean to the west. Border counties: Mauritania (north), Mali (east), Guinea and Guinea-Bissau (south), The Gambia (enclave). Major river: Senegal River (forms northern border), Gambia River, Casamance River.
Lao PDR	A landlocked country in Southeast Asia, bordered by China, Vietnam, Cambodia, Thailand, and Myanmar. **Mekong River, which flows along its**

	western border and is vital for transportation, agriculture, and fishing.
Dal lake	It is a lake in Srinagar, the summer capital of Jammu and Kashmir. It is an urban lake, the second-largest lake in Jammu and Kashmir. It is variously known as the "Lake of Flowers", "Jewel in the crown of Kashmir" or "Srinagar's Jewel".
Pobitora Wildlife Sanctuary	It is located on the southern **bank of the Brahmaputra River in Morigaon district**, adjacent to Guwahati in Assam. It was declared a reserve forest in 1971 and a wildlife sanctuary in 1987. It is home to the highest population density of Indian One-Horned Rhinoceros.
Madagascar	It is island country lying off the southeastern coast of Africa. Madagascar is the fourth largest island in the world, after Greenland, New Guinea, and Borneo
MACE	The Major Atmospheric Cherenkov Experiment (MACE) telescope is a state-of-the-art ground-based gamma-ray telescope inaugurated in Hanle, Ladakh. It is indigenously built by the **Bhabha Atomic Research Centre (BARC) with support from the Electronics Corporation of India Ltd. (ECIL), and Indian Institute of Astrophysics (IIA)**.
Pterosaur	Paleontologists have announced the discovery of a new species of quetzalcoatline azhdarchid pterosaur, Nipponopterus mifunensis, from the Late Cretaceous of Japan. It flourished during the Triassic, Jurassic, and Cretaceous periods of the Mesozoic Era (252.2 million to 66 million years ago).
Gelephu	An innovative urban development project integrating economic growth, mindfulness, holistic living, and sustainability. A low-rise, mandala-inspired city features inhabitable bridges, "ribbonlike neighborhoods" integrated with rivers, and flood-protecting paddy fields. It includes modern and traditional health facilities, an international airport, markets, spiritual centers, and self-governing institutions. Two protected areas—a national park and wildlife sanctuary—preserve its ecology
Samos	If is Greek island in the eastern Aegean Sea, close to the Turkish coasts, just 1,700 meters from the Asia Minor Turkish Coast. It is characterized by **steep mountain ranges, sandy beaches, azure sea water**, olive groves, and green pine forests.
Arkavathy River	An important mountain river in Karnataka and a significant tributary of the Kaveri River. Originates at **Nandi Hills, Chikkaballapura district**, at an elevation of 1478 meters. Tributaries: Kumudavathi, Suvarnamukhi, and Vrishabhavathi.
Reykjanes Peninsula	It is a peninsula in southwest Iceland. It is Characterized by **lava fields, volcanoe**s, and heightened geothermal activity. It is **situated along the Mid-Atlantic Rift**, where the **Eurasian and North American** tectonic plates drift apart.
Ashtamudi Lake	It is Kollam district, Kerala. The word **"Ashtamudi" means "Eight braids" in Malayalam**, referring to the lake's palm-shaped topography with multiple branches. The **second largest lake in Kerala**, with eight 'arms' or channels, and connects to the sea through the Neendakara estuary.
Raimona NP	It is located along the Indo-Bhutan border in Kokrajhar district, Bodoland

	Territorial Region (BTR), Assam. It was declared a national park on June 5, 2021. Rivers: **Sonkosh River (west) and Saralbhanga River (east).**
Baltic sea	The Baltic Sea is a semi-enclosed inland sea located in Northern Europe. Considered an arm of the Atlantic Ocean, it is connected to it via the Kattegat Strait, Skagerrak Strait, and the North Sea.
Jarawa tribe	The **Middle Andaman and South Andaman Islands PVTG** are believed to descend from the extinct Jangil tribe, showcasing excellent health and survival skills as hunter-forager-fishermen. Their population, now 250-400, declined post-British colonization but began interacting with outsiders and accessing modern facilities since 1997. They inhabit dense forests, mangroves, and beaches, maintaining a unique tropical lifestyle.
Rengama Naga	The Rengma tribe, of **Mongoloid stock** and **Tibeto-Burman ethnic group**, primarily inhabit Nagaland and Assam. Traditionally agriculturalists practicing **Jhum and wet cultivation**, they have transitioned from worshipping supernatural beings to Christianity. Their key festival is **Ngada**, celebrating agricultural cycles.
DANA	**DANA or cold drop** takes place **when cold air descends over the warm waters of the Mediterranean Sea.** This results in atmospheric instability, causing hotter, moist air on the surface of the sea to rise quickly, leading to the **formation of dense, towering cumulonimbus clouds** in a matter of hours. These clouds then dump heavy rain in parts of Spain.
Eocene Period	The Eocene is the second of five epochs in the Tertiary Period — the second of three epochs in the Paleogene — and lasted from about 55.8 to 33.9 million years ago. The oldest known fossils of most of the modern orders of mammals appear in a brief period during the early Eocene and all were small, under 10 kg.
Reang tribe	The community, primarily residing in Tripura, Mizoram, and Assam, is recognized as a Particularly Vulnerable Tribal Group (PVTG) in Tripura. Originally from Shan State (Myanmar), they speak "Kaubru" and practice Hinduism, with a strong cultural identity highlighted by the Hojagiri folk dance. Economically, they transitioned from Jhum cultivation to modern agriculture.
Smog	Smog is a harmful mix of smoke and fog caused by burning coal, vehicular emissions, and industrial fumes. It includes sulfurous smog (from coal) and photochemical smog (from NOx and hydrocarbons). Smog causes respiratory problems, reduced visibility, plant damage, and contributes to global warming due to its carcinogenic and environmental impact.
Amber	Amber is fossilized tree resin that stabilizes through chemical changes and loss of volatile components. Major deposits are found in Baltic Sea sands, dating back 40–60 million years. It is valued for its gem quality and used in ornaments, beads, and other items, often containing fossil inclusions.
Yanadi Tribe	The Yanadi tribe, primarily found in Andhra Pradesh's Nellore district, consists of three subgroups: Manchi, Adavi, and Challa Yanadi. They have a rich cultural heritage, including traditional occupations like hunting, gathering, and agriculture, along with deep medicinal knowledge. Their religious practices combine local deities and Hindu gods, with cultural expressions like the

	Dhimsa dance and a strong traditional village council for dispute resolution.

3.5   ADDITIONAL TOPICS FOR READING FROM IASGYAN WEBSITE

TOPIC NAME	UPLOADED ON IAS GYAN WEBSITE ON
Puerto Rico, Pranhita WLS, Papua New Guinea, Mount Lewotobi Laki-Laki, Gobind Sagar Lake, US	2, 5TH NOV
World Cities Report 2024: Cities and Climate Action	6, 8TH NOV
What are the costs of population decline?	7TH NOV
Horn of Africa, Zambia, Germany, Sirpur lake, West bank, Philippines, Sukhna lake	11TH NOV
Roadmap for global tsunami preparedness	11, 13, 14, 15TH NOV
Solomon Islands, Barak river, Chancay port, Sabarmati river, Dominica, Fengal	20TH NOV
Human evolution	17, 21, 22ND NOV
Pennaiyar River water dispute	26TH NOV

9. GOVERNMENT SCHEMES

Svastik

Context

- Recognizing the importance of traditional knowledge, PM Modi emphasized the need to share scientific proof of these practices with the public.
- He tasked the **Council of Scientific and Industrial Research (CSIR)** to lead this effort. CSIR is working with different partners across the country to implement a national initiative called '**Communicating India's Scientifically Validated Traditional Knowledge'**.

About SVASTIK

- The **CSIR-National Institute of Science Communication and Policy Research (CSIR-NIScPR)** has been chosen to lead this initiative. The initiative has been launched under the brand name **"SVASTIK"**.
- **SVASTIK** stands for **Scientifically Validated Societal Traditional Knowledge**. It aims to:
- Preserve the right traditional practices.
- Promote scientific thinking to verify traditions.
- Build confidence in the scientific value of traditional knowledge.
- The SVASTIK initiative creates and shares easy-to-understand content about traditional knowledge. This content is available in **English, Hindi** and various **regional languages** through digital platforms.

'One Day One Genome' Initiative

Context

- The **Department of Biotechnology (DBT)** and **Biotechnology Research and Innovation Council (BRIC)** have introduced the '**One Day One Genome' initiative** to explore and highlight India's unique microbial diversity.

What Is the 'One Day One Genome' Initiative?

- This initiative focuses on identifying and studying unique bacterial species found in India. It emphasizes how microorganisms are essential for the environment, agriculture, and human health.

How Will This Initiative Help?

- A **fully annotated bacterial genome will be made available to the public**. Detailed summaries and infographics will make the information accessible to everyone.
- This knowledge will help improve:
  o Environmental management.
  o Agricultural productivity.
  o Human health.

Who Is Leading the Initiative?

- The project is coordinated by **BRIC-NIBMG** (National Institute of Biomedical Genomics), an institute under the Department of Biotechnology.

Impact

- The initiative makes microbial genome data accessible to researchers, students and the public. It promotes scientific discussions and innovations that can benefit the entire ecosystem. This initiative is a step towards unlocking the immense potential of microbes for the betterment of society and the planet.