



INSIGHTSIAS

SIMPLIFYING IAS EXAM PREPARATION

TUMAINI FESTIVAL

THE TUMAINI FESTIVAL, AN ANNUAL EVENT HELD SINCE 2014 AT MALAWI'S DZALEKA REFUGEE CAMP, CELEBRATES THE RESILIENCE AND CULTURE OF REFUGEES THROUGH MUSIC, ART, AND CRAFTS.

4 NOV - 9 NOV 2024

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GENERAL STUDIES – 1

Topics: Urbanization, their problems and their remedies.

1. SHAPING SUSTAINABLE CITIES: THE YOUTH IMPACT

Context:

World Cities Day is observed on October 31, highlighting urban challenges and opportunities worldwide.

- This year's theme, "**Youth Climate Changemakers: Catalysing Local Action for Urban Sustainability**," reflects the focus on sustainable urban growth led by younger generations.

Definition and Present Status of Urbanisation:

Definition: Urbanisation refers to the increase in population within urban areas, leading to expansion and development.

- **Urban Population:** About 40% (500 million) of India's population now lives in urban areas (World Bank, 2023).
- **Urban Growth Rate:** Grew from 27.7% in 2001 to 31.1% in 2011, with a 2.76% annual rate (Census 2011).
- **Regional Distribution:**
 - **Maharashtra:** 50.8 million (13.5% of urban population).
 - **Uttar Pradesh:** 44.4 million.
 - **Tamil Nadu:** 34.9 million (Ministry of Housing and Urban Affairs).
- **Shift to Medium Towns:** Growth focus is shifting from Tier-1 cities to mid-sized towns due to factors like employment and lifestyle (ADB, 2019).
- **Global Context:** India contributes significantly to the global urban population of 4.7 billion (57.5%) with projections to double by 2050 (UN).
- **Housing Demand:** Shortfall of 18.78 million urban housing units, mostly affecting low-income groups (Ministry of Housing and Urban Affairs, 2012-27).

Types of Urbanisations:

- **Natural urbanisation:** Growth within urban populations due to natural birth rates.
- **Migration-driven urbanisation:** Influx of people from rural to urban areas seeking better job opportunities, services, and lifestyle.
- **Peripheral urbanisation:** Expansion of cities into surrounding rural areas, forming peri-urban regions.
- **Economic urbanisation:** Driven by industrialisation, business hubs, and employment opportunities.

Challenges in Urbanisation:

- **Environmental issues:** Air pollution and urban heat islands; 9 of the 10 most polluted cities globally are in India (World Air Quality Report, 2023).
- **Inadequate housing:** Around 40% of urban Indians live in slums, with an estimated housing shortfall of 18.78 million units.
- **Water scarcity:** Cities like Bengaluru and Chennai face recurring water crises due to poor management.
- **Traffic and mobility:** Congestion costs are rising, with cities like Bengaluru seeing average peak traffic speeds as low as 18 km/h.
- **Waste management:** India generates 62 million tons of waste annually, with only 20% treated (CPCB).

Government Initiatives:

- **Smart Cities Mission:** Developing sustainable and citizen-friendly urban infrastructure.
- **AMRUT:** Improving basic services in cities, including water supply, sanitation, and public transport.
- **Pradhan Mantri Awas Yojana-Urban (PMAY-U):** Aiming to address housing shortages in urban areas.
- **Swachh Bharat Mission-Urban:** Promoting cleanliness and waste management.
- **Deen Dayal Antyodaya Yojana - National Urban Livelihoods Mission (DAY-NULM):** Aims at poverty reduction and livelihood opportunities in urban areas.

Way forward:

- **Environmental initiatives:** Adoption of the "Sponge City" concept to manage rainwater and reduce urban flooding.
- **Digital urban planning:** Implementation of urban digital twins for data-driven urban governance.
- **Smart water management:** Use of technology to detect and manage water distribution efficiently.
- **Cybersecurity for Urban Systems:** Protecting critical urban digital infrastructure from cyber threats.

Conclusion:

India's urbanisation must align with the SDG Goal 11 for sustainable cities and NITI Aayog's Urban Transformation Strategy, emphasizing inclusive growth, resilience, and sustainable infrastructure. Through multi-level planning and technological integration, India can work towards achieving urban sustainability and inclusivity in line with global standards.

Insta Links:

1. Urbanization

PYQ:

1. With reference to the Indian economy after the 1991 economic liberalization, consider the following statements: (UPSC-2020)
 1. Worker productivity (Rs. per worker at 2004-05 prices) increased in urban areas while it decreased in rural areas.
 2. The percentage share of rural areas in the workforce steadily increased.
 3. In rural areas, the growth in non-farm economy increased.
 4. The growth rate in rural employment decreased.

Which of the statements given above is/are correct?

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

Answer: b)



GENERAL STUDIES - 2

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

2. ALIGARH MUSLIM UNIVERSITY CASE

Context:

The Supreme Court's verdict in the Aligarh Muslim University (AMU) case reaffirmed that institutions of national importance can retain their minority character under **Article 30** of the Constitution.

- The ruling resolves debates on the **coexistence of "national" and "minority" traits** in institutions.

What is a Minority Institution?

- **Constitutional provisions:**
 - **Article 30(1):** Grants minorities the right to establish and administer educational institutions of their choice.
 - **Article 28:** Restricts religious instruction in institutions maintained by state funds but allows it in minority institutions.
- **Legal provisions:**

- **National Commission for Minority Educational Institutions Act, 2004:** Provides legal recognition and safeguards for minority educational institutions.
- **Supreme Court Interpretation:** Recognizes the rights of religious and linguistic minorities.

Judgement on Aligarh Muslim University Case:

- **Holistic Outcome:**
 - **National and Minority Coexistence:** Institutions of national importance can also hold minority status, and these attributes are not mutually exclusive.
 - **Fundamental Rights:** Article 30(1) rights cannot be subservient to parliamentary declarations under Entries 63 and 64.
 - **Preservation of Rights:** Establishing and administering institutions must remain vested with the minority community to uphold constitutional guarantees.
- **Significance:**
 - Protects the dual identity of institutions like AMU.
 - Strengthens the autonomy of minority institutions in India.

Previous Cases and Verdicts on Minority Institutions:

- **St. Stephen's College v. University of Delhi (1992):** Affirmed that minority institutions have the right to set their admission policies but must adhere to national standards for quality education.
- **T.M.A Pai Foundation v. State of Karnataka (2002):** Laid down guidelines for determining minority status and the extent of autonomy in administration.
- **Pramati Educational and Cultural Trust v. Union of India (2014):** Exempted minority institutions from the Right to Education (RTE) Act's reservation provisions.

Criteria for Classification as Minority Institution:

- **Establishment and Administration:** The institution must be established and administered by a religious or linguistic minority.
 - **Genesis and Intent:** Purpose must predominantly benefit the minority community.
 - **Administration:** Need not be exclusively managed by the minority but should reflect minority interests.
 - **Funding Sources:** Minority status is unaffected by state aid or contributions from other communities.
 - **Historical Context:** Institutions established pre-Constitution can claim minority status.
- NOTE:** Key criteria for determining an education-

al institution's entitlement to minority rights protection under Article 30(1) of the Indian Constitution were explicitly discussed in the judgment.

Role of Minority Institutions in India:

- Promoting education:** Minority institutions ensure access to quality education for disadvantaged groups.
E.g. St. Xavier's College (Kolkata), Jamia Millia Islamia (New Delhi).
- Cultural Preservation:** Act as hubs for preserving linguistic and religious diversity.
E.g. Aligarh Muslim University, Gurukul Kangri Vishwavidyalaya.
- Fostering inclusivity:** Contribute to nation-building by integrating marginalized communities.
E.g. Madrasas providing secular education alongside religious studies.
- Skill development:** Equip minorities with skills for socio-economic upliftment.
E.g. Vocational programs at Christ University (Bengaluru).

Conclusion

Minority institutions in India play a pivotal role in preserving cultural identity while contributing to educational and social equity. The Supreme Court's judgment reinforces the balance between national integration and constitutional protection of minority rights.

Insta Links:

- Issues-minority-educational-institutions-minority-status

PYQ:

- In India, if a religious sect/community is given the status of a national minority, what special advantages it is entitled to? (UPSC-2011)
 - It can establish and administer exclusive educational institutions.
 - The President of India automatically nominates a representative of the community to Lok Sabha.
 - It can derive benefits from the Prime Minister's 15-Point Programme.

Which of the statements given above is/are correct?

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

Answer: c)



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

3. 'QUOTA-WITHIN-QUOTA' SYSTEM

Context:

Recent debates, spurred by a Supreme Court ruling, have questioned whether a 'quota-within-quota' system is needed to ensure that affirmative action policies are more equitable across SC subgroups.

Existing Reservation Quotas:

- Scheduled Castes (SC):** 15% reservation in education and public employment.
- Scheduled Tribes (ST):** 7.5% reservation.
- Other Backward Classes (OBC):** 27% reservation with a "creamy layer" exclusion.
- Economically Weaker Sections (EWS):** 10% reservation without caste restrictions.

Constitutional Articles and Court Judgments on Subcategorization:

- Article 15(4) and Article 16(4):** Enable the State to make special provisions for backward classes.
- 2004 E V Chinnaiyah Case:** Held that SC/ST categories should remain homogenous.
- 2024 Verdict:** Overturned the 2004 ruling, allowing States to create subcategories within SCs and STs to enhance social justice for the most marginalized groups.

Case Study: Punjab's SC Quota Subdivision

In Punjab, the SC quota was subdivided in 1975 to provide special provisions for the Balmiki and Mazhabi Sikh communities, who were among the most marginalized. This policy led to improvements in representation for these groups, enabling them to access more educational and employment opportunities. However, continuous monitoring and updated data were essential to assess its efficacy, demonstrating the need for sustained evaluation in quota-subdivision models.

Advantages of Quota-within-Quota:

- Targeted Assistance:** Quota-within-quota ensures that benefits reach the most disadvantaged subgroups within SC/ST categories, addressing the issue of unequal access among subgroups.
- Reduces monopolization:** It prevents dominant subgroups from cornering benefits, promoting a fairer distribution across various SC/ST communities.
- Enhanced representation:** By focusing on the most marginalized, this approach helps ensure that diverse subgroups have improved represen-

tation in education and employment.

- **Flexible policy design:** It allows States to customize affirmative action policies to better address the socio-economic conditions specific to different regions and communities.
- **Promotes social justice:** By narrowing the gap within the broader SC/ST categories, quota-within-quota policies help achieve a more equitable approach to social upliftment.

Limitations of Quota-within-Quota:

- **Data Deficiency:** Lack of recent, accurate caste-based data complicates identifying the subgroups that need the most assistance, making implementation challenging.
- **Political influence:** The policy can be exploited for political gains, as seen in some states, which may lead to arbitrary or biased allocation of sub-quotas.
- **Implementation challenges:** Administering multiple sub-quotas within existing reservations can create logistical and administrative complexities, potentially leading to inefficiencies.
- **Dilution of Reservation Impact:** Fragmenting quotas within a group can reduce the overall effectiveness of reservations by creating competition among subgroups rather than promoting collective upliftment.
- **Increased social fragmentation:** Subcategorization may deepen social divisions within SC/ST groups, potentially leading to inter-group tensions and undermining unity.

Way ahead:

- **Strengthen access:** Ensure all eligible SC groups have equal access to reservation benefits by improving administrative reach.
- **Updated census data:** Conduct a detailed caste-based Census to make data-driven policy decisions.
- **Transparent criteria:** Establish clear guidelines for subcategorization to avoid political misuse.
- **Public awareness:** Increase awareness on eligibility and rights within SC groups to bridge gaps in reservation accessibility.
- **Monitoring and Evaluation:** Regularly assess the impact of quota policies to address any emerging inequities.

Conclusion:

The introduction of a “quota-within-quota” is a step toward achieving more nuanced affirmative action. By acknowledging intra-category differences within SCs, policymakers can ensure a fairer distribution of resources. However, careful planning, clear criteria, and updated data are essential to ensure these policies fulfill their intended purpose without political manipulation.

Insta Links:

1. Sub-classification-within-SC & ST



PYQ:

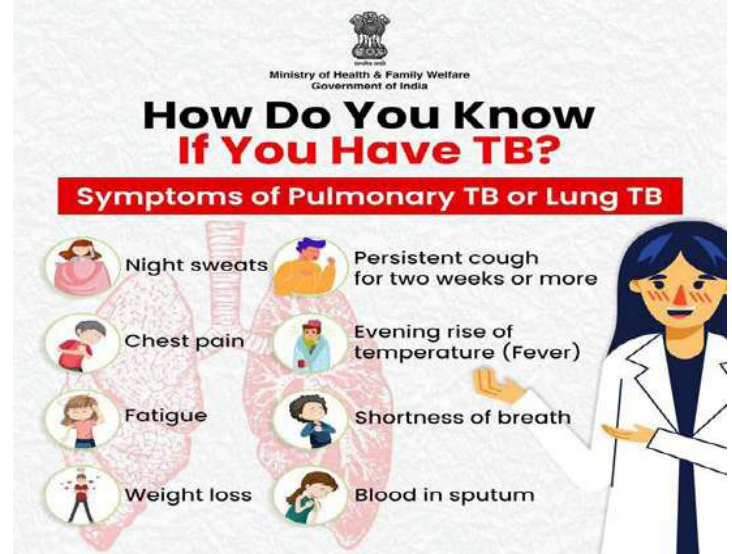
1. What are the two major legal initiatives by the State since Independence addressing discrimination against Scheduled Tribes (STs). (UPSC-2017)

Topics: Issues relating to development and management of Social Sector/Services relating to Health, Education, Human Resources.

4. TUBERCULOSIS IN INDIA

Context:

India has made notable progress in its mission to eliminate tuberculosis (TB), with a 17.7% decline in TB incidence from 2015 to 2023, surpassing the global average.



Strategies and Targets for Ending Tuberculosis in India:

- **SDG Goal 3.3:** Target to end TB by 2025, five years ahead of the global 2030 deadline.
- **Key targets:**
 - 80% reduction in TB incidence from 2015 levels.
 - 90% reduction in TB mortality.
 - Zero TB-affected households facing catastrophic expenses.

India’s approach:

- **National tuberculosis elimination programme (ntep):** Implements the National Strategic Plan (NSP) 2017–2025 for TB elimination.
- **Diagnosis expansion:** Increased access to spu-

GENERAL STUDIES - 3

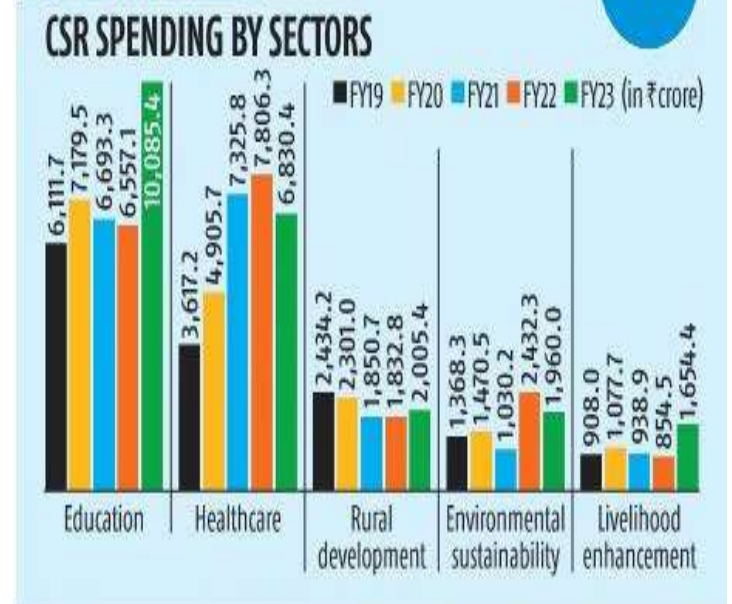
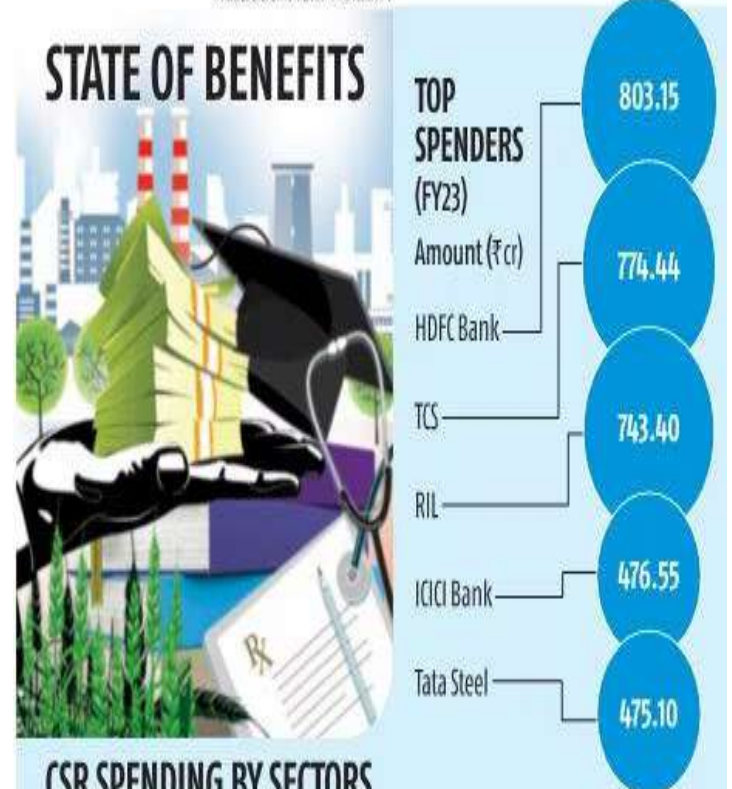
Topics: Indian Economy and issues relating to planning, mobilization of resources, growth, development and employment.

1. CORPORATE SOCIAL RESPONSIBILITY

Context:

India, the first country to mandate Corporate Social Responsibility (CSR), has seen **over ₹1.84 lakh crore invested through CSR from 2014 to 2023**. With agriculture employing nearly half of the workforce and contributing 16.73% to GDP, interest in directing CSR funds toward agricultural sustainability is rising.

Illustration: AJAY MOHANTY



- tum smear and nucleic acid amplification tests.
- **Treatment support:** Direct Benefit Transfer (DBT) via Ni-kshay Poshan Yojana; incentives for ASHA workers, TB champions, and family caregivers.
 - **Community engagement:** Pradhan Mantri TB Mukh Bharat Abhiyaan (PMTBMBA) drives community involvement with support from over 1.5 lakh Ni-kshay Mitras.
 - **Holistic care:** Focuses on coexisting health conditions like malnutrition, diabetes, HIV, and substance abuse through inter-ministerial partnerships.

Challenges:

- **High TB Burden:** India continues to bear the world’s highest TB burden.
- **Resource constraints:** Limited healthcare infrastructure and workforce in remote areas.
- **Awareness and Stigma:** Social stigma and low awareness impact treatment adherence.
- **Drug resistance:** Increasing drug-resistant TB strains present treatment challenges.

Way forward:

- **BCG studies:** Research on adult BCG vaccination.
- **Expanded preventive therapy:** scale up Tuberculosis Preventive Therapy (TPT) with new, shorter regimens.
- **Improved diagnostics:** Broaden access to molecular diagnostic tests.
- **Decentralized care:** TB service delivery through Ayushman Arogya Mandirs.
- **Enhanced Community Support:** Strengthen community-based care via PMTBMBA.



Insta Links:

1. Global-TB-report-2023

PYQ:

1. “Besides being a moral imperative of a Welfare State, primary health structure is a necessary precondition for sustainable development.” Analyse. (UPSC-2021)

About Corporate Social Responsibility (CSR):

- **Definition:** CSR involves corporate initiatives focused on societal, environmental, and economic development, enabling companies to positively impact communities.
- CSR Framework in India:
 - **Legal Basis:** Governed by Section 135 and Schedule VII of the Companies Act, 2013, and Companies (CSR Policy) Rules, 2014, which outline eligibility criteria, implementation, and reporting requirements for CSR activities.
 - **Criteria for CSR:** Mandatory for companies meeting any of the following:
 - Net worth of ₹500 crore or more,
 - Annual turnover of ₹1,000 crore or more,
 - Net profit of ₹5 crore or more.
 - Such companies are required to allocate 2% of their average net profits from the past three years toward CSR.
 - **Penal Provisions:** If a company fails to meet CSR obligations, it faces fines ranging from ₹50,000 to ₹25 lakh. Responsible officers may face imprisonment (up to three years), fines between ₹50,000-₹5 lakh, or both.
 - **2019 Amendment:**
 - Prior to 2019, unspent CSR funds could be carried forward to the next fiscal.
 - Post-amendment, unspent funds must be transferred to a specified Schedule VII fund by the end of the fiscal year and utilized within three years, failing which, they must be deposited in a government-specified fund.

CSR Contribution to Agriculture:

- **Employment significance:** Agriculture employs 47% of India's workforce, far above the global average.
- **Economic role:** Contributing 16.73% to GDP, agriculture is central to India's economic growth and sustainability.
- **Focus on Sustainability:** Corporates are increasingly supporting sustainable agricultural practices, including climate action and resource conservation, through their CSR funds.
- **CSR initiatives:** Corporates increasingly support agriculture through CSR, focusing on projects like grain banks, farmer education, sustainable irrigation, and water conservation.

Challenges:

- **Tracking issues:** Lack of specific classification for agriculture-related CSR efforts complicates tracking and monitoring.
- **Sector overlap:** CSR activities in agriculture often fall under multiple categories in Schedule VII, diluting agriculture-specific reporting.
- **Inadequate reporting focus:** Current CSR reports lack dedicated attention to agriculture, limiting accurate assessment of impact on agricultural sustainability.
- **Ambiguity in Schedule VII:** Broad categories under Schedule VII result in a mix of activities, affecting transparency and the potential to track agriculture-specific CSR contributions effectively.

Way Ahead:

- **Designate Agriculture as a Separate CSR Sector:** Define agriculture clearly within CSR guidelines to ensure more targeted and transparent funding.
- **Revise Reporting Framework:** Shift to a sector-based reporting structure to enhance accuracy in fund allocation and impact tracking for agricultural projects.
- **Identify Critical Issues:** Recognize key sustainability challenges in agriculture to direct CSR funds toward the most pressing areas for improvement.
- **Encourage Sustainable Practices:** Leverage CSR to drive sustainable agricultural practices, such as conservation, water management, and agroforestry, to support India's environmental goals.

Conclusion:

To enhance CSR's impact on agriculture, India should refine its reporting framework by designating agriculture as a distinct sector, promoting transparency, and focusing funds on specific sustainability challenges. This approach aligns CSR with national priorities, better supports farmers, and advances sustainable agriculture.

Insta Links:

1. Impact-of-CSR-funds

PYQ:

1. Corporate social responsibility makes companies more profitable and sustainable. Analyse. (UPSC-2017)



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

2. DEDICATED FREIGHT CORRIDORS

Context:

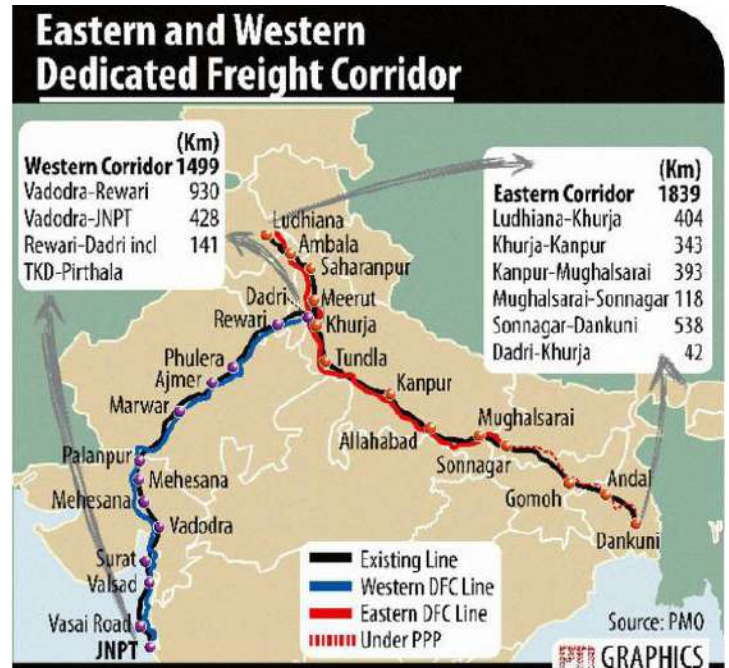
As India's economy grows, dedicated freight corridors are proving instrumental in boosting the Railways' revenue and contributing to GDP growth, with significant impacts on freight efficiency, connectivity, and infrastructure development.

What are Dedicated Freight Corridors (DFCs)?

DFCs are specialized railway tracks designed solely for freight transport. These corridors, utilizing double-stack container and heavy-haul trains, increase capacity and ensure faster freight transit.

Currently, two DFCs are operational:

- Eastern dedicated freight corridor (**EDFC**):
 - **Route:** Covers approximately 1,856 km from Ludhiana (Punjab) to Dankuni (West Bengal).
 - **Key sections:** Kanpur-Mughalsarai and Khurja-Bhaupur.
 - **Operations:** Fully commissioned, handling nearly 200 trains daily, primarily transporting coal, steel, and agricultural products.
 - **Impact:** Relieves congestion on existing tracks, improves passenger train punctuality, and boosts regional economic activities.
- Western dedicated freight corridor (**WDFC**):
 - **Route:** Stretches about 1,504 km from Dadri (Uttar Pradesh) to Jawaharlal Nehru Port Trust (JNPT) in Maharashtra.
 - **Key sections:** Rewari-Palanpur and Palanpur-Makarapura.
 - **Operations:** 93% complete, facilitating around 125 trains per day, with full completion expected by December 2025.
 - **Impact:** Enhances port connectivity, reduces transit time for goods, and significantly lowers logistics costs for exports and imports.



Need for Dedicated Freight Corridors:

- **Congestion relief:** Existing railway corridors, particularly the Golden Quadrilateral, are heavily burdened with over 50% of freight traffic on only 16% of track length, causing delays and inefficiencies.
- **Boost to Freight Share:** Railways' share in national freight traffic was declining; DFCs aim to elevate this to 45% by 2030, addressing the need for a more sustainable and efficient freight system.
- **Economic efficiency:** Faster, dedicated freight lines lower overall logistics costs, helping reduce commodity prices and fostering economic growth.

Present Status of DFCs: (Source: DFCCIL Report)

- DFCs now handle over **10% of Indian Railways' freight**.
- **An average of 325 trains run on DFC** tracks daily, a 60% increase from previous years.
- Since their inception, DFCs have managed **over 232 billion Gross Tonne Kilometres (GTKMs) and 122 billion Net Tonne Kilometres (NT-KMs)**, underscoring their role in enhancing rail freight capacity.

Dedicated Freight Corridors (DFCs) Contribute to India's GDP:

- **Reduction in Logistics Costs:** DFCs have reduced freight costs and transit time, lowering commodity prices by up to 0.5%, thus boosting industrial competitiveness.
- **Revenue Growth for Railways:** DFCs contributed 2.94% to the Indian Railways' revenue growth between FY 2018-19 and FY 2022-23, enhancing infrastructure profitability.
- **Increased Freight Capacity:** Handling over 10% of Railways' freight and reducing congestion on

traditional routes allows better resource allocation and efficient goods transport.

- **Boost to Export-Import Traffic:** Faster transit on DFC routes, especially in the WDFC linked to major ports, supports increased trade volumes, fueling GDP growth.
- **Employment and Investment:** Construction and operation of DFCs have generated jobs and attracted investments, directly contributing to economic activity and growth.
- **Enhanced Supply Chain Efficiency:** By improving freight reliability and decongesting passenger tracks, DFCs support a smoother, faster supply chain that benefits various sectors.

Challenges to DFCs:

- **Completion delays:** The WDFC's final section has an extended deadline until July 2025, impacting projected timelines and efficiencies.
- **Escalating costs:** Delays have raised project costs significantly, with a reported avoidable expenditure of Rs 2,690 crore, pushing total spending to Rs 94,091 crore as of March 2024.
- **Loss of Intended Benefits:** Delays reduce the immediate benefits of decongestion and increased capacity, impacting the Railways' revenue potential.

Way Ahead:

- **Timely completion:** Fast-track the completion of ongoing DFC segments to avoid further delays and financial overruns.
- **Expansion plans:** Expedite development on four proposed corridors to extend DFC benefits nationwide, including the East Coast and East-West sub-corridors.
- **Enhanced efficiency:** Continuous investment in technology and infrastructure to ensure DFCs remain efficient and competitive in handling future freight demands.

Conclusion:

Dedicated Freight Corridors **symbolize** 'Viksit Bharat', aligning with India's goal of modernizing infrastructure and enhancing logistics efficiency. Once fully operational, DFCs will drive economic growth, support industry, and strengthen India's position as a logistics hub.

Insta Links:

1. DFC

PYQ:

1. With reference to bio-toilets used by the Indian Railways, consider the following state-

ments: (UPSC-2015)

1. The decomposition of human waste in the bio toilets is initiated by a fungal inoculum.
2. Ammonia and water vapour are the only end products in this decomposition which are released into the atmosphere.

Which of the statements given above is/are correct?

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



3. WORLD SOLAR REPORT SERIES

Context:

The International Solar Alliance (ISA), an international coalition focused on promoting solar energy solutions, released the 3rd edition of its World Solar Report series at the 7th Assembly, highlighting solar growth, investment trends, technological advancements, and green hydrogen's potential in Africa.

About ISA:

- **Origin:** Established in 2015 at COP21, jointly launched by India and France.
- **Headquarters:** Gurgaon, India.
- **Aim:** Mobilize \$1 trillion in solar investments by 2030, advance solar technology, and transition to a carbon-neutral future.
- **Members:** 120 Member and Signatory countries, focusing on regions with high solar potential.
- **Criteria:** Open to countries lying fully or partially between the Tropics of Cancer and Capricorn, though other interested countries may join.

Recently Released Reports:

1. World Solar **Market Report**
 - **Global Solar Growth:** From 1.22 GW in 2000 to 1,418.97 GW in 2023; projected to reach up to 7,203 GW by 2030.
 - **Manufacturing & Affordability:** Solar manufacturing capacity to exceed 1,100 GW by 2024; module prices below \$0.10/watt.
 - **Employment:** Solar sector supports 7.1 million jobs globally, with 86% concentrated in ten countries.
2. **World Investment Report**
 - **Growth in Energy Investments:** Investments rising from \$2.4 trillion in 2018 to \$3.1 trillion by 2024.

- **Solar Dominance:** Solar accounts for 59% of renewable energy investments, with APAC as the top investing region.
 - **Regional Investment:** APAC at \$223 billion, EMEA at \$91 billion, and AMER at \$78 billion in 2023.
- 3. World Technology Report**
- **Efficiency & Innovation:** Record solar PV efficiency at 24.9%; 88% reduction in silicon use since 2004.
 - **Cost Reduction:** Utility-scale PV costs have dropped 90% since 2010, now at \$0.044/kWh.
 - **Material Advancements:** Multijunction perovskite cells promising enhanced efficiency and lower production costs.
- 4. Green Hydrogen Readiness Assessment for African Countries**
- **Potential for Decarbonization:** Green hydrogen seen as a sustainable substitute for fossil fuels in industries.
 - **Production via Renewables:** Hydrogen generated through renewable-powered electrolysis supports Africa's transition to green energy.
 - **Target Countries:** Focuses on Egypt, Morocco, Namibia, among others, for developing a green hydrogen economy.

Key positives:

- **Massive solar capacity growth:** Global solar capacity rose from 1.22 GW in 2000 to 1,418.97 GW in 2023, making renewable energy more accessible.
- **Cost reductions:** Solar PV costs have dropped significantly, with utility-scale PV now at \$0.044/kWh, making solar energy more affordable.
- **Employment opportunities:** The solar industry supports 7.1 million jobs globally, fueling economic growth in many countries.
- **Green hydrogen potential:** Solar-powered green hydrogen is positioned to decarbonize key industries in regions like Africa, aiding the clean energy transition.

Key negatives:

- **High initial investment:** Setting up solar infrastructure and green hydrogen facilities still requires substantial financial investments.
- **Dependency on Technological Advancements:** Solar's future efficiency depends on continuous breakthroughs in technology and materials.
- **Uneven regional growth:** Investment and infrastructure development are uneven across regions, with APAC leading while others lag.
- **Resource intensity:** Despite improvements, solar manufacturing remains resource-intensive, with ongoing concerns over silicon use and waste.

Way ahead:

- **Boost regional investments:** Encourage more balanced solar investments across regions, especially in EMEA and Africa.
- **Focus on Innovation:** Prioritize research and development to improve solar efficiency and reduce manufacturing resource needs.
- **Support green hydrogen projects:** Promote green hydrogen infrastructure, particularly in resource-rich regions like Africa, for industrial decarbonization.
- **Foster international collaboration:** Leverage partnerships like ISA to share best practices, pool resources, and drive down costs globally.

Conclusion:

ISA's efforts in promoting solar technology and green hydrogen mark a significant step in the global green push, accelerating sustainable growth. Solar energy is emerging as a cornerstone of the world's transition to a cleaner, more resilient energy future.



Insta Links:

1. International-solar-alliance

PYQ:

1. India has immense potential for solar energy though there are regional variations in its developments. Elaborate. (UPSC-2020)

[Topics: Awareness in the fields of IT, Computers, robotics, nano-technology, bio-technology and issues relating to intellectual property rights.](#)

4. RNA EDITING

Context:

Recently, companies like Wave Life Sciences have made significant strides in RNA editing, with the first clinical application of this technology.

About RNA Editing:

- **Definition:** RNA editing involves making precise changes to RNA molecules, which carry instructions from DNA to produce proteins. This process allows scientists to correct errors in RNA before they are translated into proteins.
- **Mechanism:** One method uses enzymes like adenosine deaminase acting on RNA (ADAR) to convert adenosine to inosine, which mimics guano-

sine, restoring normal protein function.

- **Guide RNA (gRNA):** gRNA directs ADAR enzymes to specific mRNA regions to correct mutations linked to genetic disorders.

Difference Between RNA and DNA Editing:

- **Permanency:** DNA editing makes permanent changes to the genome; RNA editing makes temporary changes, reducing long-term risk.
- **Safety:** DNA editing uses proteins from bacteria, which may cause immune reactions; RNA editing utilizes ADAR enzymes already present in the human body, lowering immune risks.
- **Flexibility:** RNA editing allows effects to fade over time, enabling doctors to stop treatment if side effects arise.

Challenges in RNA Editing:

- **Specificity:** ADAR enzymes may cause unintended edits in non-targeted mRNA regions, which could lead to side effects.
- **Transient Effects:** The temporary nature of RNA edits requires repeated treatments for sustained benefits.
- **Delivery Limitations:** Current delivery methods, like lipid nanoparticles, struggle with transporting large molecules, limiting effectiveness.

Applications in Various Fields:

- **Genetic Disorders:** Treats single-point mutations in conditions like Huntington’s disease, Duchenne muscular dystrophy, and alpha-1 antitrypsin deficiency.
- **Neurological Conditions:** Companies are exploring RNA editing for diseases like Parkinson’s.
- **Oncology:** Rnomics’ trials focus on using RNA editing to regulate protein production related to liver cancer.
- **Ophthalmology:** Treating ABCA4 retinopathy, which is caused by mutations affecting protein expression in the eye.

Conclusion:

RNA editing offers a promising, flexible approach to treating genetic disorders with fewer risks than DNA editing. As clinical applications expand, RNA editing is poised to become a vital tool in precision medicine. Ongoing research and collaboration are key to unlocking its full potential.

Insta Links:

1. Gene-editing

PYQ:

1. With reference to agriculture in India, how can the technique of ‘genome sequencing’,

often seen in the news, be used in the immediate future? (UPSC-2017)

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

Select the correct answer using the code given below:

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

Answer: d)



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

5. CONVENTION ON BIOLOGICAL DIVERSITY – THE COP RESULTS

Context:

The 16th meeting of the Conference of the Parties (**COP-16**) to the **Convention on Biological Diversity (CBD)** was held in **Cali, Colombia**, where 190 countries discussed measures to achieve global biodiversity goals, including the ambitious 30-by-30 target.

About COP-16:

- The COP-16 aims to finalize mechanisms for implementing the Kunming-Montreal Global Biodiversity Framework (KMGBF) targets, which were set in 2022.
- The primary focus was on ensuring biodiversity conservation, reducing pollution, and establishing fair benefit-sharing systems, especially for Digital Sequence Information (DSI).
- The conference emphasized integrating biodiversity into national and global policies and aligning climate change actions with biodiversity goals.

About Convention on Biological Diversity (CBD)

- **Origin:** Opened for signature in 1992 at the Rio Earth Summit; entered into force on December 29, 1993.
- **Aim:** To promote the conservation of biodiversity, the sustainable use of its components, and equitable sharing of benefits arising from genetic resources.
- **Features:**
 - Ratified by 196 countries (excluding the United States).
 - Has three primary objectives: conservation, sustainable use, and equitable benefit-sharing.
 - Supplementary agreements include the Cartagena Protocol on Biosafety and the Nagoya Protocol on Access and Benefit-Sharing.

Key Outcomes from COP-16:

- **30-by-30 Commitment:** Aiming to conserve 30% of land and ocean areas by 2030 and restore 30% of degraded ecosystems.
- **Inclusion of Indigenous Voices:** Establishment of a body to include indigenous groups in biodiversity discussions.
- **Digital sequence information (DSI):** Ongoing debates on fair benefit-sharing from the use of genetic data, with plans for a multilateral mechanism yet unresolved.
- **Implementation support:** Agreement on technical support for biodiversity mainstreaming, addressing invasive species, and enhancing biodiversity-climate synergy.

India's Contribution at COP-16:

- **Financial commitment:** India presented an updated biodiversity plan, projecting an expenditure of ₹81,664 crore for biodiversity and conservation from 2025-30, building on the ₹32,207 crore spent from 2018-22.
- **Call for International Funding:** India emphasized the need for international finance, as outlined in KMGBF's Target 19, to support biodiversity goals beyond government funds.
- **National biodiversity strategy:** India highlighted its National Biodiversity Strategy and Action Plan (NBSAP), reinforcing its commitment to biodiversity conservation through targeted actions.
- **Initiatives in Conservation:** India cited the establishment of the International Big Cat Alliance for the conservation of big cats, indicative of its efforts in global wildlife conservation.
- **Expansion of Ramsar Sites:** India raised its number of Ramsar sites (wetlands of international importance) from 26 in 2014 to 85 and aims to reach 100, underscoring its dedication to wetland conservation.

Drawbacks of COP-16:

- **Funding gaps:** Only a fraction of the estimated \$200 billion required annually for biodiversity goals has been pledged.
- **Unresolved issues:** No consensus on contributions to the DSI fund or mechanisms for financial and technical resource allocation.
- **Non-binding framework:** The KMGBF targets remain non-binding, potentially impacting global commitment to these goals.

Way ahead:

- **Securing financing:** Mobilize international funding, as indicated in KMGBF's Target 19, to close the biodiversity financing gap.
- **Strengthening implementation:** Improve frameworks for monitoring progress toward the 30-by-30 targets and ensure nations adhere to biodiversity policies.
- **Enhancing collaborative action:** Foster partnerships with indigenous communities and local governments to promote sustainable biodiversity practices.

Conclusion

The COP-16 underlined the urgent need for committed global cooperation and robust financial support to address the biodiversity crisis. Aligning efforts with Sustainable Development Goals and models like the NITI Aayog's focus on sustainability, India and other nations must work collectively to secure a healthy ecosystem for future generations.



Insta Links:

1. International-conventions

PYQ:

1. "Momentum for Change: Climate Neutral Now" is an initiative launched by (UPSC-2018)
 - (a) The Intergovernmental Panel on Climate Change
 - (b) The UNEP Secretariat
 - (c) The UNFCCC Secretariat
 - (d) The World Meteorological Organisation

Answer: c)

2. How is the Government of India protecting traditional knowledge of medicine from patenting by pharmaceutical companies? (UPSC-2019)

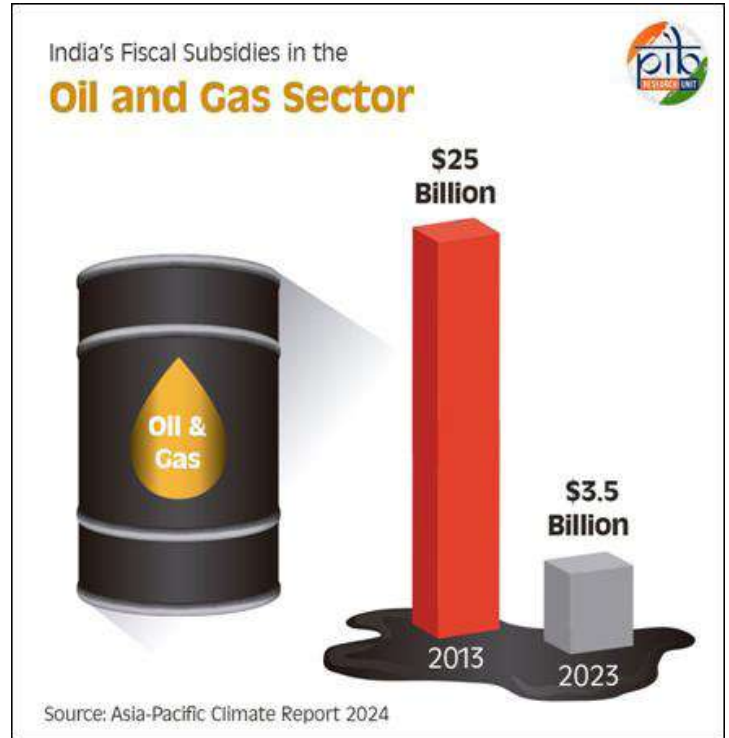
6. INDIA'S GREEN LEAP: A SHIFT FROM FOSSIL FUELS TO CLEAN ENERGY

Context:

The Asia-Pacific Climate Report from the Asian Development Bank (ADB) highlights India's efforts and accomplishments in the major shift from fossil fuels to clean energy domain, which include key reforms and subsidy reallocations.

Key Findings in the Asia-Pacific Climate Report:

- **Reduction in Fossil Fuel Subsidies:** India's reforms have led to an 85% reduction in fossil fuel subsidies, from \$25 billion in 2013 to \$3.5 billion in 2023.
- **Taxation for Renewable Energy:** India implemented a cess on coal production from 2010 to 2017, funding clean energy projects like the Green Energy Corridor and National Solar Mission.
- **Targeted subsidy redirection:** Tax hikes on petrol and diesel redirected funds toward renewable initiatives, with LPG access for rural communities also enhanced.
- **Investment in Clean Energy:** National programs, including the Green Hydrogen Mission and PM-KUSUM, aim to support green infrastructure, cut emissions, and improve energy access.



Positive Impact on Climate Goals: The report emphasizes India's progress toward its 2070 net-zero target, setting a model for other nations.

Positives of India's Energy Transition:

- **Significant Subsidy Reduction:** Redirecting funds from fossil fuels to renewables represents a major shift towards sustainability.
- **Rural Energy Access:** Improved access to LPG and clean energy in rural areas supports both social welfare and environmental goals.
- **Investment in New Energy Technologies:** Programs in green hydrogen and solar energy showcase India's commitment to next-generation energy solutions.
- **Strengthened Renewable Energy Infrastructure:** Projects like the Green Energy Corridor enhance transmission networks for renewable energy.
- **Economic and Environmental Benefits:** Reduced dependency on fossil fuels benefits both the economy and the environment by lowering emissions.

Limitations of India's Energy Transition:

- **Tax Reallocation Challenges:** Funds from the coal cess were diverted to GST compensation post-2017, impacting clean energy funding.
- **Dependency on Fossil Fuels:** Despite reforms, fossil fuels still play a significant role in India's energy mix, indicating slow progress in a complete shift.
- **Limited Access to Subsidies:** Disparities exist in accessing clean energy subsidies, especially in remote or underserved areas.

- **High Cost of Technology Transition:** Advanced clean energy technologies require significant investments and can be costly for initial rollout.
- **Political and Fiscal Adjustments:** Shifting subsidies and adjusting tax structures are complex processes with potential for political challenges.

Way Ahead:

- **Strengthen Funding Mechanisms:** Ensure stable funding for clean energy projects by revisiting cess allocations and reducing fiscal dependency on fossil fuel-based revenue.
- **Scale Renewable Initiatives:** Expand programs like PM-KUSUM to cover more regions and increase solar and wind energy capacity.
- **Support Clean Energy R&D:** Invest in research and development for technologies like green hydrogen and advanced battery storage to make them economically viable.
- **Enhance Rural Access:** Strengthen infrastructure for rural clean energy adoption, ensuring equitable access to sustainable resources.
- **Policy Consistency:** Maintain a steady and transparent policy framework to encourage private investments in clean energy.

Conclusion:

India’s shift from fossil fuels to clean energy demonstrates its strong commitment to sustainable growth. The ADB’s Asia-Pacific Climate Report highlights India’s progress in reducing fossil fuel subsidies and advancing renewables, positioning **it as a leader in energy reform.** With ongoing investment and inclusive policies, India is well-placed to achieve its 2070 net-zero goal.



Insta Links:

1. Green-energy

PYQ:

1. “Access to affordable, reliable, sustainable and modern energy is the sine qua non to achieve Sustainable Development Goals (SDGs)”. Comment on the progress made in India in this regard. (UPSC-2018)

CONTENT FOR MAINS ENRICHMENT

| Topic in News | Usage in Answers |
|--|---|
| <p>1. INDIA'S FOSSIL FUEL SUBSIDY REFORMS</p> | <p>Context: The Asian Development Bank (ADB) has commended India for its strategic fossil fuel subsidy reforms since 2010. By adopting a phased “remove, target, and shift” approach, India significantly cut fossil fuel subsidies while bolstering its support for renewable energy and clean technology.</p> <p>ADB Report on India - Key Points</p> <ul style="list-style-type: none"> • Fossil Fuel Subsidy Reduction: in subsidies by 85%, from \$25 billion in 2013 to \$3.5 billion in 2023. • Fuel Subsidy Phase-Out: Between 2010-2014, India gradually removed subsidies on petrol and diesel, allowing for incremental tax increases (2010-2017) to create fiscal room for clean energy initiatives. • Targeted Subsidies for LPG: Tax increases from 2014 to 2017, during low global crude prices, redirected funds to enhance LPG access for rural populations, helping reduce reliance on solid fuel. |

| | |
|--|---|
| | <ul style="list-style-type: none"> • Coal Cess for Clean Energy: From 2010-2017, a cess on coal (approx. 30%) supported India’s clean energy fund, aiding renewable projects, solar missions, and off-grid energy solutions. • Growth of Renewable Energy Support: Subsidies for renewable energy peaked in 2017, reflecting increased investments in clean technologies, and are rising again after a slight decline post-2018. <p>Relevance for UPSC Exam</p> <ul style="list-style-type: none"> • Environment & Climate Change • Governance & Policy • Economy • International Relations |
| <p>2. INDIA VISHWAMITRA STAND</p> | <p>Context: External Affairs Minister S. Jaishankar, emphasizing India’s approach in a multi-polar world, stated that India aims to position itself as a “Vishwamitra” or a friend to all, underlining that friendships are no longer exclusive.</p> <p>Quotes and Key Statements by the Minister:</p> <ul style="list-style-type: none"> • “Friendships are no longer exclusive in a multipolar world; India aims to be a ‘Vishwamitra’ – a friend to all.” • “What one nation may see as freedom, another might perceive as interference.” • “India is not a dogmatic civilization, and there is a capability aspect, a self-confidence in how we approach the world.” <p>Relevance in UPSC Syllabus</p> <ul style="list-style-type: none"> • International Relations • Ethics in Public Administration • Political Science • GS Paper II |
| <p>3. FALSE CONSCIOUSNESS</p> | <p>Context: Recently, U.S. Republican candidate Donald Trump visited a McDonald’s in Pennsylvania to connect with working-class voters, highlighting the GOP’s focus on swing-state demographics often impacted by its policies.</p> <p>False Consciousness:</p> <ul style="list-style-type: none"> • Definition: False consciousness is a concept derived from Marxist theory, describing a scenario where individuals act against their own economic interests due to manipulated beliefs and values. • Theory background: Karl Marx posited that capitalist structures and elite-controlled institutions obscure social realities, preventing workers from recognizing the exploitation they face. • Media influence: Media outlets can perpetuate false consciousness by presenting themselves as aligned with the working class while promoting elite-driven narratives. • Culture wars: As observed by journalist Thomas Frank, Republicans engage in cultural battles (e.g., over abortion, immigration, and gender issues) to distract voters from economic concerns, casting these issues as central to American values and traditional morality. • Significance: This ideological approach enables elites to retain power by fostering division, aligning economic grievances with identity-based struggles, and rallying support for policies that ultimately disadvantage the working class. <p>Relevance in UPSC Syllabus:</p> <ul style="list-style-type: none"> • GS II • Ethics (GS IV) • PSIR: Links to Marxist ideology and identity politics, examining how culture wars and populism shape political behavior and global trends. • Sociology: Explores class dynamics and media’s role in maintaining social hierarchies, essential for understanding societal structures and class awareness. • Essay Writing: Useful for themes on governance, media ethics, and public perception, providing a foundation to discuss public opinion manipulation. |

4. COMMITTEES ON WESTERN GHATS

Context: The Union Environment Ministry’s expert committee, led by former forest director-general Sanjay Kumar, is set to examine Goa’s proposals concerning eco-sensitive areas (ESA) in the Western Ghats.

Committees on Western Ghats:

- **Sanjay Kumar Committee:**
 1. Formed to review state objections on ESA demarcations and validate proposed exclusions.
 2. Will conduct field visits to verify if demands for village exclusions from ESA listings are justified.
 3. Seeks to finalize the ESA status for villages, restricting activities harmful to biodiversity.
- **Madhav Gadgil Committee (2011):**
 1. Established by UPA government to propose protection measures for the Western Ghats.
 2. Recommended designating the entire Western Ghats as ecologically sensitive.
 3. Proposed the creation of a dedicated ecological authority to regulate development.
 4. Report suggested rigorous conservation, but its recommendations were not fully adopted.
- **Kasturirangan Committee (2012):**
 1. Formed as a follow-up to the Gadgil Committee to provide a more moderate approach.
 2. Based ESA demarcations on 37% of the Western Ghats, focusing on forested areas.
 3. Emphasized a balance between conservation and developmental needs, allowing limited activity in specific areas.

Relevance in UPSC Syllabus

- **Environment and Ecology (GS Paper III):**
 - Highlights **biodiversity conservation** in the Western Ghats, a critical ecological zone.
 - Discusses **sustainable development and conservation policies**.
- **Governance (GS Paper II):**
 - Showcases **policy-making** and **Centre-State relations** in ecological matters.
- **Geography (GS Paper I):**
 - Focus on **Western Ghats’ geography** and its environmental challenges.
- **Ethics (Ethics Paper):**
 - Addresses **ethical dilemmas** in balancing development with ecological preservation.

5. DIRECTOR GENERAL OF POLICE, UTTAR PRADESH SELECTION AND APPOINTMENT RULES

Context: The Uttar Pradesh government has introduced new rules for the selection of the Director General of Police (DGP).

Key Points: New UP Rules for DGP Selection

- **Selection Committee:** Headed by a retired High Court judge, it includes the Chief Secretary, a UPSC nominee, the UP Public Service Commission chairperson or nominee, the Additional Chief Secretary/Principal Secretary (Home), and a retired DGP.
- **Eligibility Criteria:** Candidates must have a minimum of six months of service remaining from the date of DGP vacancy.
- **Objective:** To establish an independent, transparent selection mechanism for the DGP, free from political or executive interference.

Relevance in UPSC Syllabus

- **Governance (GS Paper II):** Illustrates reforms in state administration and police governance as per Supreme Court guidelines.
- **Indian Polity (GS Paper II):** Highlights state-level autonomy in appointments, showing federal balance.
- **Ethics in Public Administration (GS Paper IV):** Reflects accountability, transparency, and independence in police appointments, essential values in public service.

| | |
|--|--|
| <p>6. CIA-CIA TRIBE</p> | <p>Context: The Cia-Cia tribe on Buton Island, Indonesia, is using Hangul, the Korean alphabet, to document and preserve their indigenous language, which has survived orally for centuries but lacks its own script.</p> <p>About Cia-Cia tribe:</p> <ul style="list-style-type: none"> • Cia-Cia tribe: Indigenous community in Buton Island, Indonesia, with a population of around 93,000. • Language status: The Cia-Cia language has existed orally for centuries without a formal script, making it vulnerable to extinction. • Preservation efforts: To prevent language loss, Cia-Cia is being transcribed using Hangul, which aligns closely with its phonetic structure. <p>About Hangul Script:</p> <ul style="list-style-type: none"> • Structure: Known for its unique phonetic system of circles and lines, representing sounds clearly. • Adoption for Cia-Cia: Introduced in 2009 for Cia-Cia as Arabic script did not suit the language's sounds. • Implementation: Used in schools, textbooks, and public signs in Cia-Cia areas. • Cultural concerns: While some fear cultural influence, others believe the adaptation helps preserve Cia-Cia's uniqueness. |
| <p>7. SPEECH AT ASIAN BUDDHIST SUMMIT</p> | <p>Context: President Droupadi Murmu inaugurated the first <u>Asian Buddhist Summit</u> organised by the Union Culture Ministry and the International Buddhist Confederation in New Delhi.</p> <p>President speech in Asian Buddhist Summit:</p> <ul style="list-style-type: none"> • “Buddha Dharma can bring peace, real peace, to Asia and the world — a peace free from not only physical violence but also from all forms of greed and hatred.” • “If one word could capture the Buddha Dhamma, it had to be karuna or compassion, which is what the world needs today.” • “The preservation of the Buddha’s teachings has been a great collective endeavour.” • “The middle path and four noble truths of the Buddha offer timeless solutions.” • “India reaffirms its commitment to strengthen the ‘Dhamma Setu’, the Buddhist bridge connecting Asian nations.” <div style="border: 1px solid black; padding: 5px;"> <p>NOTE: Use the statement made by the president in your introduction and conclusion will fetch you an added advantage in your answer.</p> </div> <p>Relevance in UPSC Syllabus</p> <ul style="list-style-type: none"> • Ethics (GS-IV): Insights on compassion (karuna) and non-violence as ethical principles. • Indian Culture (GS-I): Role of Buddhism in Indian heritage and its global influence. • International Relations (GS-II): Use of Buddhism for diplomatic and cultural relations with Asian countries. |
| <p>8. IMPACTS OF SOCIAL MEDIA ON KIDS</p> | <p>Context: The Australian government has announced plans to introduce legislation that would restrict social media access for children under 16, aiming to reduce the potential harm caused by online platforms.</p> <p>Issues Due to Social Media for Children Under 16</p> <ul style="list-style-type: none"> • Mental health: Social-media can lead to anxiety, depression, and low self-esteem as children may experience comparison and cyberbullying. • Idealized realities: Constant exposure to idealized lives can cause dissatisfaction, self-doubt, and pressure to conform to unrealistic standards. • Cyberbullying and Online Exploitation: Persistent bullying online and potential exposure to manipulative or harmful content pose serious safety concerns. • Exposure to Inappropriate Content: Children may accidentally access violent, explicit, or age-inappropriate material, leading to potential trauma. • Academic and Social Impact: Excessive social media use can hinder academic performance and real-world communication skills, affecting social relationships and cognitive development. <p>Relevant for UPSC Exam Syllabus</p> <ul style="list-style-type: none"> ○ GS II (Governance) ○ GS IV (Ethics) ○ Essay |

9. CAFE LAMMA

Context: Libya, a nation recovering from years of conflict, is seeing the rise of sustainable initiatives like *Cafe Lamma* in Tripoli, which promotes eco-friendly practices and creative reuse of materials to inspire environmental awareness and community engagement.

About Cafe Lamma:

- **Sustainability and Recycling:** Built entirely from recycled materials like tyres, wood, and construction waste, the cafe promotes environmental conservation in a country lacking recycling infrastructure.
- **Cultural and Educational Hub:** Hosts art galleries, workshops, and a library, fostering community engagement and a shift toward eco-consciousness in post-war Libya.

Relevance in UPSC Syllabus:

- **Ethics and Environment:** Demonstrates ethical responsibility and innovative approaches to sustainable development.
- **Society and Culture:** Highlights post-conflict community rebuilding through arts and sustainable practices.
- **Disaster Management:** Reflects adaptive use of resources in war-affected regions, relevant to resilience-building strategies.

10. QUOTES FROM CJI SPEECH

Context: CJI DY Chandrachud, during the **Express Adda**, reflected on key judicial and constitutional issues, including the judiciary’s role in societal transformation, judicial appointments, diversity, same-sex marriage debates, and the significance of open courts.

Catchy statement from CJI Speech:

- “It’s the diversity of the nation which protects the basic structure of the Constitution.”
- “The ultimate guarantee of our good behaviour lies in the written word.”
- “Constitutional court function is not just to decide cases, but to promote a democratic dialogue.”

Relevance in UPSC Exam

- **Ethics and Integrity:** CJI’s emphasis on neutrality and diversity ties into ethical governance and the responsibilities of public officials.
- **Judiciary in Governance:** Insights into the role of judiciary in promoting democratic dialogue and balancing independence with societal expectations.
- **Constitutional Values:** His remarks on diversity safeguarding the basic structure doctrine are crucial for GS-II and Essay papers.
- **Judicial Reforms:** Perspectives on court technology and judicial appointments align with topics in governance and reforms.

FACTS FOR PRELIMS

GS-1

Art & Culture

1. TUMAINI FESTIVAL

Context:

The Tumaini Festival, an annual event held since 2014 at Malawi's Dzaleka Refugee Camp, celebrates the resilience and culture of refugees through music, art, and crafts.

About Tumaini Festival:

- **Founded:** 2014, by Menes La Plume, a Congolese poet.
- **Purpose:** To create a unique platform for cultural exchange, showcasing resilience through music, art, and crafts.
- **Visitors:** Thousands from Malawi and nearby countries, including South Africa and Zimbabwe.
- **Significance:** Builds connections and breaks stereotypes by humanizing the refugee experience, allowing people to share common experiences and celebrate cultural diversity.
- **2024 Event:** Organized by the camp's youth, many of whom were born in the camp, reflecting local pride and ownership.

About Dzaleka Refugee Camp:

- **Location:** Near Lilongwe, Malawi, originally established on a former prison site.
- **Established:** 1994, following regional conflicts, particularly in Africa's Great Lakes region.
- **Capacity:** Originally designed for 10,000 refugees but now houses over 60,000.
- **Populations:** Primarily from DRC, Rwanda, Burundi, Ethiopia, and Somalia.
- **Role:** The camp has become a focal point for humanitarian efforts and cultural exchange, aiming to uplift and empower its residents despite challenging conditions.

Insta links:

1. Festivals

2. ASIAN BUDDHIST SUMMIT

Context:

India is set to host the first Asian Buddhist Summit (ABS) in New Delhi on November 5-6, 2024, organized by the Ministry of Culture in collaboration with the International Buddhist Confederation (IBC).

| Timeline of The Spread of Buddha Dhamma | |
|--|--|
| 6th Century BCE | Siddhartha Gautama attains enlightenment. |
| Emperor Ashoka promotes Buddha Dhamma across his empire. | 268-232 BCE |
| 1st Century BCE | Emergence of Mahayana and Nikaya traditions within Buddhism. |
| Ashoka's dhammaduta establish communities in Sri Lanka, Myanmar, and beyond. | 3rd Century BCE |
| 1st Century BCE | Kasyapa Matanga and Dharmaratna spread Buddhism along the Silk Route to Central and East Asia. |
| Masters like Atisha Dipankara and Bodhidharma contribute to the dissemination of Buddha Dhamma in Tibet and East Asia. | 11th Century |

About Asian Buddhist Summit 2024:

- **Origin:** Initiated by the Government of India and IBC to promote Buddhist heritage and interfaith dialogue across Asia for the first time.
- **Ministry:** Organized by the Ministry of Culture, Government of India.
- **Location:** Bharat Mandapam, New Delhi, India.
- **2024 theme:** "Role of Buddha Dhamma in Strengthening Asia."
- **Aim:** To celebrate the cultural and spiritual heritage of Buddhism in Asia, fostering dialogue and collaboration on challenges faced by the Buddhist community.
- **Significance:**
 - **Cultural Unity:** Strengthens ties across Asia, celebrating shared Buddhist heritage and values.
 - **Spiritual development:** Promotes mindfulness, compassion, and interconnectedness through Buddha Dhamma.
 - **Global leadership:** Reinforces India's role as a leader in preserving and promoting Buddhism, aligning with India's Act East and Neighborhood First policies.
 - **Tourism and Economy:** Encourages Buddhist pilgrimage tourism, supporting the local economy and cultural preservation.
 - **Scientific and Well-being Insights:** Showcases the integration of Buddha Dhamma in scientific research and well-being, including mindfulness and mental health practices.

Insta links:

1. Global Buddhist Summit

3. KALKA-SHIMLA NARROW-GAUGE RAILWAY

Context:

Himachal Pradesh Chief Minister Sukhvinder Singh Sukhu has urged the Indian government to explore the possibility of using green hydrogen to power the Kalka-Shimla narrow-gauge railway, a UNESCO World Heritage site.

- This initiative aligns with **Himachal Pradesh's goal to become a 'green energy State' by 2026**, and would contribute to India's climate goals

About Kalka-Shimla Narrow-Gauge Railway:

- **World heritage status:** Declared a UNESCO World Heritage Site on July 8, 2008.
- **Location:** Spans from Kalka in Haryana (elevation 2,152 ft) to Shimla, Himachal Pradesh (elevation 6,808 ft).
- **Route details:** The 96.6 km single-track railway passes through 18 stations, 102 tunnels, and 988 bridges.
- **Historical significance:** Built in 1898 to connect Shimla (then the summer capital of British India) to the Indian rail network.
- **Engineering feats:** Features 864 bridges, the world's highest multi-arc gallery bridge, and 919 curves, with the sharpest curve having a 48-degree radius.
- **Construction:** Built under the guidance of **Chief Engineer H.S. Harington**; early locomotives by Sharp, Stewart and Company, later by the Hunslet Engine Company.

Insta Links:

1. KSR Railways

4. MAHA KUMBH MELA 2025

Context:

The Maha Kumbh Mela 2025 in Prayagraj will be held from January 13 to February 26, drawing millions of pilgrims to perform sacred rituals and seek spiritual liberation.

About Maha Kumbh Mela:

- **Origin:** Rooted in Hindu mythology, the Maha Kumbh Mela began as a pilgrimage tradition thousands of years ago, with early references in Maurya and Gupta periods (4th century BCE to 6th century CE).
- **Cycle & Locations:** Occurs every 12 years, rotating between four locations — Prayagraj, Haridwar,

Ujjain, and Nashik — each with its sacred rivers: Ganges, Yamuna, Shipra, and Godavari.

- **Rivers:** Prayagraj hosts the Mela at the Triveni Sangam, the confluence of the Ganges, Yamuna, and the mythical Sarasvati, considered highly auspicious for spiritual cleansing.
- **Tracing the History of Kumbh Mela**
 - **Ancient Origins:** Dates back thousands of years, with early references during the Maurya and Gupta periods (4th century BCE to 6th century CE).
 - **Growth with Hinduism:** Gained importance as Hinduism spread, with Gupta rulers elevating its status as a revered religious gathering.
 - **Medieval patronage:** Supported by dynasties like the Chola and Vijayanagar in the south, and the Delhi Sultanate and Mughals in the north.
 - **Mughal tolerance:** Emperor Akbar allowed Naga Sadhus to lead the royal procession in 1565, symbolizing religious and cultural unity.
 - **Colonial documentation:** British officials, including James Prinsep in the 19th century, recorded its rituals, large gatherings, and socio-religious impact.
 - **Post-independence significance:** Became a symbol of national unity and cultural heritage, recognized by UNESCO in 2017 as an intangible cultural heritage of humanity.
- **Significance:** Recognized as a UNESCO intangible cultural heritage, it represents a quest for spiritual purity, unity, and self-realization, attracting diverse pilgrims, sadhus, and international seekers.

Insta links:

1. Kumbh-mela-2019

Geography

5. PARAGLIDING

Context:

Polish paraglider Andrew Babinski was stranded in Himachal Pradesh's Dhauladhar hills after a mid-air collision with another participant, while rescue efforts failed due to difficult terrain. Separately, an Australian competitor in the **Paragliding World Cup 2024**, which began on November 2 with 94 participants from 26 countries, sustained a leg injury before takeoff despite strict safety protocols.



About Dhauladhar Hills:

- **Location:** The Dhauladhar range is part of the Lesser Himalayan mountains, stretching from the north of Kangra and Mandi in Himachal Pradesh to near Badrinath in Uttarakhand.
- **Elevation:** The elevation ranges widely from about 3,500 meters to nearly 6,000 meters.
- **Topography:** Primarily composed of granite, with limestone and sandstone deposits in some areas.
- **Highest peak:** Hanuman Tibba is the highest peak in the Dhauladhar range.
- **Glacial lakes:** The Lam Dal Lake is a notable glacial lake located within this range.
- **Major pass:** Indrahhar Pass, which serves as a boundary between the Kangra and Chamba districts in Himachal Pradesh, is a popular trekking route in the Dhauladhar.

About Bir:

- **Location:** Bir is a rural village in the Joginder Nagar Valley, situated in the Dhauladhar range foothills within Kangra district, Himachal Pradesh.
- **Reputation:** Known as the “Paragliding Capital of India,” attracting enthusiasts for adventure sports and international competitions.
- **Cultural significance:** Home to Tibetan Buddhist monasteries of the Nyingma, Karma Kagyu, and Sakya schools, along with a large stupa.
- **Activities:** Ecotourism, spiritual studies, meditation, and trekking draw visitors throughout the year.
- **Tibetan colony:** Established in the early 1960s as a settlement for Tibetan refugees post-1959, forming a cultural hub with Tibetan influences.

Insta links:

1. Places-in-news
2. Himalayas

GS-2

Judiciary

6. PROPERTY OWNERS ASSOCIATION V. STATE OF MAHARASHTRA JUDGEMENT

Context:

The Supreme Court recently held in a 7:2 decision that not all private properties can be classified as “material resources of the community” under Article 39(b) of the Indian Constitution.

Background:

- **Article 39(b):** Part of the Directive Principles of State Policy, this article mandates that the state should direct policies to distribute ownership and control of resources in a way that best serves the common good.
- **Key Cases:**
 - **State of Karnataka v. Ranganatha Reddy (1978):** Justice Krishna Iyer argued that material resources of the community included all resources, whether publicly or privately owned.
 - **Sanjeev Coke Manufacturing v. Bharat Coking Coal Ltd. (1982):** Affirmed Justice Iyer’s view on the broader interpretation of Article 39(b).
 - **Mafatlal Industries Ltd. v. Union of India:** Supported the notion that material resources of the community could include privately owned assets.

About 2024 Case Overview:

- **Case name:** Property Owners Association v. State of Maharashtra
- **Outcome:** The Supreme Court clarified that:
 - Only certain private resources, based on factors like their impact on the community and scarcity, could be considered material resources under Article 39(b).
 - The judgment overturned the broad interpretation by Justice Iyer, asserting that not all private properties qualify as resources to be equitably distributed by the state.
 - The court upheld that material resources should primarily cover state-owned resources or private resources with significant community value.

Insta Links:

1. DPSP

7. INTERMEDIARY VS PUBLISHER

Context:

The Union government has issued a notice to Wikipedia questioning its status as an intermediary under the IT Act, citing complaints of biases and editorial control.

About Intermediary (as per the IT Act):

- **Definition:** Entities that store, receive, or transmit information created by third parties.
- **Criteria:** To qualify, they must not have editorial control over content and should not create content directly.
- **Liability Shield:** Intermediaries are not liable for third-party content hosted on their platforms.
- **Due Diligence:** They must ensure illegal content is not posted by users and adhere to the IT Rules.
- **Penalization:** If found failing to meet these standards, intermediaries' risk being classified as publishers, which can expose them to criminal liabilities.

About Publisher (as per the IT Act):

- **Definition:** Entities that produce, edit, or publish original content.
- **Criteria:** Publishers have control over what content appears on their platforms and are involved in content creation.
- **Liability:** Publishers are fully responsible for all content and are open to legal actions based on that content.
- **Due Diligence:** Publishers must comply with regulations but are directly liable for any defamatory, inaccurate, or unlawful content.
- **Penalization:** They face criminal penalties for content violations, such as defamation or misinformation, since they hold editorial authority.

Insta links:

1. Information-technology-act-2000

8. PM E-DRIVE SCHEME

Context:

The PM Electric Drive Revolution in Innovative Vehicle Enhancement (PM E-DRIVE) scheme, launched by the Indian government, aims to accelerate electric vehicle (EV) adoption, develop necessary charging infrastructure, and create a robust EV manufacturing ecosystem in the country.



About PM E-DRIVE Scheme:

- **Launch date:** October 1, 2024.
- **Ministry:** Ministry of Heavy Industries.
- **Budget:** Financial outlay of Rs. 10,900 crores.
- **Duration:** Active until March 31, 2026.
- **Objective:** Encourage EV adoption, reduce environmental impact from transport, and support domestic EV manufacturing.
- Key components:
 - **Subsidies:** Incentives for e-2Ws, e-3Ws, e-ambulances, e-trucks, and other EVs.
 - **Grants for Capital Assets:** Fund e-buses, charging stations, and upgrade MHI testing facilities.
 - **Administration:** Includes IEC activities and project management agency fees.
- **Eligibility criteria:**
 - **Electric two-wheelers:** Incentives are available for 24.79 lakh e-2Ws with advanced batteries, covering both private and commercial ownership.
 - **Electric three-wheelers:** Around 3.2 lakh e-3Ws, including registered e-rickshaws and L5 vehicles, qualify if used commercially and equipped with advanced batteries.
 - **Electric ambulances:** Rs. 500 crore supports e-ambulances, with standards set by the Ministry of Health and other stakeholders.
 - **Electric trucks:** Rs. 500 crore is allocated for e-trucks, requiring a scrapping certificate from a MoRTH-approved center.
 - **Electric buses:** Rs. 4,391 crore funds 14,028 e-buses for large cities, prioritizing STUs that retire older buses under MoRTH guidelines.

Insta Links:

1. PM-E-DRIVE-scheme

9. PM VIDYALAXMI SCHEME

Context:

The Union Cabinet, has approved the PM Vidyalaxmi Scheme, aimed at providing financial support to meritorious students, ensuring that financial challenges do not hinder anyone in India from pursuing quality higher education.

About PM Vidyalaxmi Scheme:

- **Objective:** To provide financial assistance to meritorious students, eliminating financial constraints in accessing quality higher education.
- **Eligibility:** Available to students admitted to top 860 HEIs in India, as per NIRF rankings, covering over 22 lakh students annually.
- **Loan features:** Offers collateral-free, guarantor-free education loans with a user-friendly, digital application process.
- **Credit guarantee:** Government provides a 75% credit guarantee on loans up to ₹7.5 lakhs, supporting banks in loan expansion.
- **Interest subvention:** For families with an annual income up to ₹8 lakhs, a 3% interest subvention is provided on loans up to ₹10 lakhs. Full interest subvention is available to students with family incomes up to ₹4.5 lakhs under the PM-USP scheme.
- **Unified portal:** The scheme will be accessible through the "PM-Vidyalaxmi" portal, enabling easy loan applications and interest subvention processing via e-vouchers and CBDC wallets.
- **Complementary schemes:** Supplements existing schemes like CSIS and CGFSEL under PM-USP, offering comprehensive support for technical and professional courses in approved HEIs.

Insta links:

1. Higher-education-in-India

GS-3

Agriculture

10. TUNA CLUSTER

Context:

The Department of Fisheries, under the Ministry of Fisheries, Animal Husbandry, and Dairying, has designated the **Andaman and Nicobar Islands as a Tuna Cluster** under the Pradhan Mantri Matsya Sampada Yojana (PMMSY).

- With approximately 6.0 lakh square km of under-utilized Exclusive Economic Zone (**EEZ**) rich in tuna resources, the region offers unique advantages in fisheries development due to its proximity to Southeast Asia, sustainable fishing practices, and conducive trade routes.

About Tuna Fish:

- **Species:** Belongs to the Thunnus genus, adapted for speed with streamlined bodies.
- **Habitat:** Found in both tropical and temperate oceans, known for extensive migrations.
- **Economic significance:** Tuna species like Skipjack, Yellowfin, and Bluefin contribute around \$41 billion annually in trade (2018).
- **Unique physiology:** Maintains a body temperature higher than surrounding water, a trait shared with Mackerel sharks and Opah.
- **Nutritional value:** High in Vitamin B12, Vitamin D, Omega-3 fatty acids, proteins, and antioxidants, supporting health and nutrition.

About Pradhan Mantri Matsya Sampada Yojana (PMMSY):

- **Launch:** Launched in 2020 as the flagship scheme of the Department of Fisheries.
- **Objective:** To boost the fisheries sector's growth through integrated, consolidated efforts from various initiatives.
- **Components:** An umbrella scheme comprising the Central Sector Scheme (CS) and Centrally Sponsored Scheme (CSS).
- **Focus areas:** Includes enhancing productivity, post-harvest infrastructure, and regulatory frameworks for sustainable fisheries development.
- **Other clusters:**
 - The Department of Fisheries has already identified three locations as priority areas for development,
 - **Hazaribagh** District in Jharkhand for **pearl culture**
 - **Madurai** District in Tamil for **ornamental fisheries**
 - UT of **Lakshadweep** for **seaweed**.

Insta links:

1. PMMSY

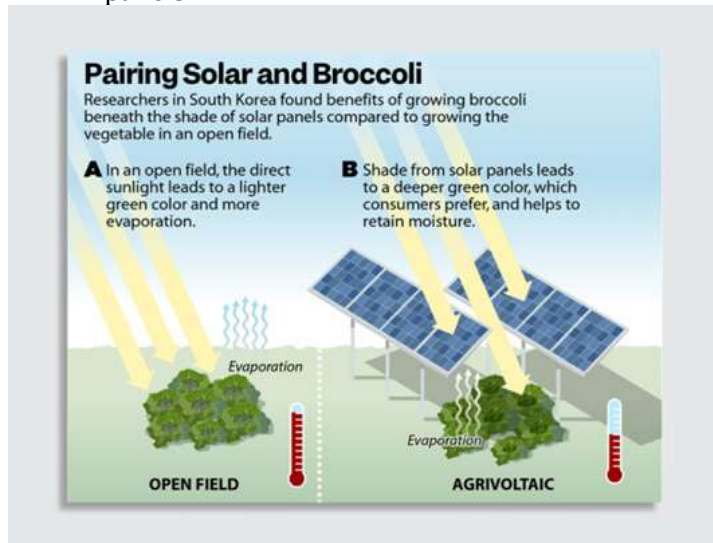
11. AGRIVOLTAIC FARMING

Context:

The Seventh Session of the International Solar Alliance (ISA) concluded in New Delhi, highlighting sustainable energy and agrivoltaic farming a practice that combines agriculture with solar energy generation on the same land.

About Agrivoltaic Farming:

- **Definition:** Agrivoltaic farming is the simultaneous use of land for agriculture and solar energy generation, allowing crops to grow beneath solar panels.



- Agrivoltaic farming working:
 - **Elevated panels:** Solar panels are raised 2-3 meters, providing space for crops to grow beneath with adequate light and air.
 - **Angle and Spacing:** Panels are angled and spaced to optimize sunlight for both solar energy and crop growth.
 - **Shade and Protection:** Panels offer shade, reducing heat stress and protecting crops from harsh weather.
 - **Water conservation:** Shading lowers evaporation, conserving soil moisture and reducing water needs.
 - **Greenhouse integration:** Panels on greenhouse roofs allow light/rain for crops while generating energy.
 - **Dual harvesting:** Utilizes land for both solar power and agriculture, maximizing energy and food production.
- **Significance of Agrivoltaic Farming:**
 - **Enhanced Land Use:** Maximizes land efficiency by combining agriculture and solar energy production on the same land.
 - **Climate resilience:** Provides shade to crops, reducing heat stress and water loss, and protecting from extreme weather.
 - **Renewable energy generation:** Contributes to solar power expansion, supporting climate goals and energy needs.
 - **Increased food security:** Supports sus-

tainable food production for a growing population without needing additional land.

- **Economic benefits:** Enables farmers to diversify income through both crop production and solar energy revenue.

Insta links:

1. Challenges-faced-by-farm-sector-in-India

12. URAD AND TUR IMPORTS

Context:

The Indian government reported a significant increase in Urad imports from Brazil, reaching over 22,000 metric tonnes.

- The Ministry of Consumer Affairs highlighted **Brazil's potential as a major supplier of Urad and Tur for India**, benefiting from **different cropping seasons** that align with India's crop demands.

About Urad:

- **Scientific name:** *Vigna mungo*, commonly known as black gram.
- **Origins:** Native to South Asia; widely cultivated and highly valued in India.
- **Culinary use:** Essential in Indian cuisine, often used as a dal and paired with rice or curry.
- **Season:** Grown in both Kharif and Rabi seasons in India.
- **Global cultivation:** Also grown in tropical regions like the Caribbean, Fiji, Myanmar, and Africa, introduced by Indian immigrants.

About Tur:

- **Scientific name:** *Cajanus cajan*, known as toor dal or pigeon pea.
- **Origins:** Indigenous to the Eastern Hemisphere; cultivated widely in tropical and semi-tropical regions.
- **Culinary use:** Commonly consumed as a staple in South Asia, Southeast Asia, and Africa.
- **Global spread:** Cultivated in Latin America and the Caribbean, widely used in regional dishes.

Insta links:

1. Production-of-pulses-in-India

Infrastructure

13. SEAPLANE SERVICE

Context:

The demonstration flight of Andhra Pradesh's first sea-

plane service is all set to take off from Punnami Ghat, near the Prakasam Barrage in Vijayawada, and land at a jetty in Srisailam in Nandyal district.

About Seaplane:

- **What it is:** A seaplane is a fixed-wing aircraft designed for takeoff and landing on water.
- **Working principle:** Utilizes buoyancy provided by water for takeoff and landing; incorporates propellers or jet engines for propulsion.
- **Types:**
 1. **Flying boats:** Feature a hull that floats on water and do not operate on land.
 2. **Floatplanes:** Equipped with pontoons (floats) attached beneath the fuselage.

About India's Seaplane Project:

- **Objective:** Enhance regional air connectivity and promote tourism through water-based aviation under the RCS-UDAN scheme.
- **India's First Seaplane Project in India:**
 - Launched in Gujarat (2020) connecting Sabarmati Riverfront (Ahmedabad) to Statue of Unity (Kevadia).
NOTE: High operating costs and difficulties in maintaining a foreign-registered aircraft led to the suspension of seaplane services in Gujarat since 2023.
- **Proposed Seaplane Routes under UDAN:**
 - **Gujarat:** Shatrunjay Dam to Ambaji and Sabarmati Riverfront to Statue of Unity.
 - **Andhra Pradesh:** Vijayawada (Prakasam Barrage) to Srisailam.
 - **Assam:** Guwahati Riverfront to Umrangso Reservoir and Shillong.
 - **Andaman & Nicobar Islands:** Jal Hans project connecting Agatti, Kavaratti, and Minicoy.
 - **Telangana:** Nagarjuna Sagar to Vijayawada and Hyderabad.

Insta Links:

1. Gujarat sea plane project

14. BIBEK DEBROY COMMITTEE'S ON RAILWAYS

Context:

The Bibek Debroy Committee's 2015 report outlined transformative reforms for Indian Railways, focusing on viability and competitiveness, though several key recommendations remain unimplemented.



Reforms report by an eight-member panel, headed by economist Bibek Debroy

Committee set up in Sept 2014 when Sadananda Gowda was rail mantri

Gowda felt Railway Board had become unwieldy

| | | |
|---|---|---|
| <p>Improving Finances Must focus on remunerative freight segment and e-commerce segment</p> <p>Leasing of parcel vans in trains through auction of carrying capacity/private parcel trains and concessioning of train services</p> <p>Must encourage on-board catering through food chains & local restaurants on payment of modest license fee</p> <p>Separate activities such as running of hospitals, schools, catering, security, real estate devpt, manufacturing of locomotives, coaches & wagons, from core function of running trains</p> |  | <p>Schools Educational needs of children of railway employees could be met by subsidizing their education in alternative schools, including KVs and private schools</p> |
| <p>Security State govts should be persuaded to bear entire cost of GRP and GMs/DRMs should have</p> | <p>Accounting Reforms Set up responsive, transparent accounting and costing system</p> | <p>Rationalizing Staff Amalgamate existing service into single unified railway service, OR second option is to create two sets of services to deal with technical and non-technical aspects</p> <p>Hospitals ➤ Give GMs/DRMs & employees choice to opt for services such as medical tests, pre-employment exam, safe water & food supply at stations either through Indian Railway Medical Services or private empanelled practitioners ➤ For preventive & curative healthcare, choice may be extended to CGHS framework; subsidized healthcare in</p> |

Key Recommendations of Bibek Debroy Committee (2015)

1. **Liberalization (Not Privatization):**
 - Allow entry of private operators to enhance growth and competition.
 - **Status:** Not implemented due to opposition; PPP projects limited to goods services.
2. **Empowering Field Officers:**
 - Delegation of decision-making powers to GMs and DRMs for greater autonomy.
 - **Status:** Partially implemented with increased decentralization efforts.
3. **Railway Board Restructuring:**
 - Redesignate Chairman as CEO with decision-making powers.
 - **Status:** Implemented in 2020 with restructured Railway Board.
4. **Independent Rail Regulator:**
 - Establish Rail Development Authority (RDA) for pricing and competition promotion.
 - **Status:** RDA approved in 2017 but with limited functioning.
5. **Accounting Reforms:**
 - Transition to accrual-based accounting to improve financial transparency.
 - **Status:** Implemented across Indian Railways.
6. **Offloading Non-Core Activities:**
 - Relieve Railways of responsibilities like RPF, medical, and educational facilities.
 - **Status:** Under consideration.
7. **Safety Upgrades:**
 - Create Rashtriya Rail Sanraksha Kosh (RRSK) for safety asset renewal with ₹1 lakh crore corpus.
 - **Status:** Extended till 2027 with additional funding of ₹45,000 crore.
8. **Technology Integration:**
 - Synergize technology, exemplified by Vande Bharat trains and KAVACH systems.
 - **Status:** Being actively implemented.

Insta Links:

1. Reforms-in-India-railway

Science & Technology

15. ALLULOSE

Context:

South Korea has emerged as a key market for **allulose**, a new sugar substitute gaining popularity among consumers and food manufacturers.

About Allulose:

- **Natural source:** Found naturally in figs, kiwis, and other fruits.
- **Sweetness and Calories:** 70% as sweet as sugar with almost zero calories, making it ideal for low-calorie diets.
- **Health benefits:** May aid in weight loss and help lower blood glucose levels when combined with sugars, beneficial for diabetics.
- **Health concerns:** Side effects include potential gastrointestinal issues like diarrhea and bloating if consumed in large quantities.
- **Regulatory status:** Approved in the U.S. and South Korea, but still classified as a “novel food” in the EU and Canada, with limited global regulatory approval.
- **Challenges:** High production costs and need for further research on long-term safety limit its broader commercialization.

Insta Links:

1. Sugar-Industry-in-India

16. PROCESSING-IN-MEMORY (PIM) TECHNOLOGY

Context:

Israeli researchers have created software that allows data processing directly in memory, bypassing the CPU.

- This advancement, developed at the **Israel Institute of Technology**, aims to **address the energy-intensive and time-consuming data transfers** between memory and CPU, which are bottlenecks in modern computing.
- By **reducing the CPU's workload**, this in-memory approach promises substantial time and energy savings.

About Python Programming Language with Digital Processing-In-Memory (PIM) Technology:

- **What it is:** Combines Python with processing-in-memory (PIM) technology, enabling computations to take place directly in memory, bypassing the CPU.
- **Need:** Tackles the “**memory wall**” problem, where data transfer rates fall behind advancements in processor speeds and memory capacity.
- **How it works:**
 - PyPIM platform introduces new instructions for in-memory operations.
 - Allows developers to use Python to create software for PIM systems.
 - Includes a simulation tool to estimate performance gains from in-memory processing.
- **Significance:**

- Reduces data transfer bottlenecks.
- Accelerates processing for mathematical and algorithmic tasks.
- Saves energy, making it efficient for high-performance computing needs.

NOTE: No need to go deep into this topic; however, UPSC sometimes asks these themes from a technology point of view. For exam purposes, understand the concept; there is no need to memorize anything from this.

Insta Links:

1. Science-and-technology
2. Neuromorphic-computing

17. GUJARAT AND SEMICONDUCTOR

Context:

Aligning with the vision for a developed India by 2047, the Gujarat government has introduced the **Gujarat Semiconductor Policy 2022-2027** to position Gujarat as a leader in semiconductor manufacturing.



More about news:

- The **Gujarat government has introduced India's first** 'Gujarat Semiconductor Policy 2022-2027.
- In **Dholera's emerging 'Semicon City'**, Tata Electronics Private Limited (TEPL) and Taiwan's Powerchip Semiconductor Manufacturing Corporation (PSMC) are establishing **India's first AI-enabled semiconductor fabrication facility** with an investment exceeding Rs 91,000 crore.
- Dholera, is being developed as **India's first Greenfield Smart City**.
- **About India Semiconductor Mission (ISM):**
 - Launch: Initiated in 2021 under the Ministry of Electronics and IT (MeitY) with a budget of Rs. 76,000 crores.
 - Objective: Develop a robust semiconductor and display manufacturing ecosystem in India.
 - Financial support: Provides incentives for companies investing in semiconductor and display manufacturing, and design ca-

pabilities.

- Focus on IP and Technology Transfer: Encourages the creation of indigenous Intellectual Property (IP) and supports the Transfer of Technologies (ToT).
- Key schemes:
 - **Semiconductor fabs:** Scheme to establish semiconductor fabrication units in India.
 - **Display fabs:** Scheme to support display manufacturing facilities.
 - **Compound semiconductors & ATMP:** Scheme for setting up facilities for compound semiconductors, silicon photonics, and ATMP/OSAT units.
 - **Design linked incentive (DLI):** Incentives to boost the design ecosystem in semiconductors.

Insta links:

1. Indias-AI-landscape-and-industry-transformation

Space

18. LIGNOSAT

Context:

In a groundbreaking move towards sustainable space exploration, **Japanese scientists** from Kyoto University and Sumitomo Forestry have developed the world's first wooden satellite, named LignoSat.

About LignoSat:

- **Developers:** Created by Kyoto University and Sumitomo Forestry.
- **Launch:** Set to launch on a SpaceX rocket next week to the International Space Station (ISS).
- **Mission purpose:** To test the resilience of wood, specifically **Japanese honoki (magnolia) wood**, in space conditions over six months.
- **Material benefits:** Wood is lightweight, resistant to shattering, and won't produce harmful particles upon re-entry as it burns up harmlessly in Earth's atmosphere.
- **Future vision:** Seen as a potential step towards building wooden structures, planting trees, and constructing sustainable habitats on the Moon and Mars.

Insta Links:

1. India-japan-relations
2. INSAT-satellites-to-analyse-fog

19. VISIBLE EMISSION LINE CORONAGRAPH

Context:

Scientists from the Indian Institute of Astrophysics (IIA) in Bengaluru have reported initial significant observations from the Visible Emission Line Coronagraph (VELC) onboard ADITYA-L1, India's first solar mission launched by ISRO.

About Recent Observation:

- The VELC on ADITYA-L1 successfully **captured and precisely estimated the onset time of a Coronal Mass Ejection (CME)** that erupted from the Sun on July 16, marking the first scientific result from India's solar mission.
- The VELC's unique capabilities allowed scientists to observe the CME close to the Sun's surface, a breakthrough as such observations are typically visible only at a greater distance from the Sun.

About Visible Emission Line Coronagraph (VELC) on ADITYA-L1:

- **Purpose:** To observe the solar corona and study Coronal Mass Ejections (CMEs) and the solar wind.
- **Structure:** Comprises a coronagraph, spectrograph, polarimetry module, and detectors with auxiliary optics.
- **Capabilities:** Enables simultaneous imaging, spectroscopy, and spectro-polarimetry near the Sun's surface.
- **Built by:** Indian Institute of Astrophysics (IIA), CREST campus, Hosakote, Karnataka, in collaboration with ISRO.
- **Functionality:** Offers continuous monitoring of the solar corona, providing critical data for understanding solar activities and modeling CMEs, especially as the Sun reaches the peak of Solar Cycle 25.

Insta links:

1. Coronal-Mass-Ejections

20. PROBA-3 SPACE SATELLITE

Context:

India, in collaboration with the European Union, is set to launch the Proba-3 Space Satellite, a solar observatory mission, in December 2024.

About Proba-3 Space Satellite:

- **Objective:** Solar observation, specifically focusing on the dynamics of the **Sun's corona**.
- **Collaboration:** Joint mission by the European Union and India, highlighting international cooperation in scientific research.

- **Launch Date:** Scheduled for early December 2024 from Sriharikota, India.
- **Significance:** Marks the third Proba satellite launch by ISRO for the EU, building on past successful launches of Proba-1 and Proba-2.
- **Technology and Science:** Equipped to provide high-resolution images and data on solar corona behavior, advancing space weather research.

Insta Links:

1. India-space-planning
2. Aditya-L1-mission

21. ZHURONG ROVER MARS EXPLORATION

Context:

China's Zhurong rover, part of the Tianwen-1 Mars mission, has provided compelling evidence suggesting that Mars harboured an ocean billions of years ago.

Discovery Made by China on Mars

- **Rover and mission details:**
 - **Rover:** Zhurong (named after a mythical Chinese fire god).
 - **Mission:** Tianwen-1, China's Mars exploration program.
- **Mars location:**
 - **Utopia Planitia:** A vast plain in Mars' northern hemisphere where geological features like troughs, sediment channels, and mud volcano formations were observed.
- **Significance of discovery:**
 - Indicates the presence of an **ancient ocean approximately 3.68 billion years ago**, likely frozen in its latter stages.
 - Supports **the theory of a Martian coastline** and varying marine environments, enhancing the possibility of past microbial life.
 - Suggests Mars transitioned from a hospitable to a **cold and dry planet** earlier than previously thought.
 - Furthers understanding of water's role in Mars' history and its implications for habitability.

Insta links:

1. Chinas-Tianwen-1-probe

Health

22. “FIRST IN THE WORLD CHALLENGE” INITIATIVE

Context:

The Indian Council of Medical Research (ICMR) has launched the “First in the World Challenge” initiative, aiming to foster groundbreaking innovations in the health sector.

About First in the World Challenge Initiative:

- **Objective:** The initiative aims to encourage bold, unique research that brings “first of its kind” innovations to the global health sector.
- **Scope:** Focuses on out-of-the-box ideas leading to breakthrough health technologies, such as novel vaccines, drugs, diagnostics, and interventions.
- **Funding criteria:** Proposals must be groundbreaking, excluding incremental advancements or process improvements. High-risk, high-reward proposals with global impact potential are prioritized.
- **Application:** Open to individual researchers or teams from single or multiple institutions.
- **Selection process:** A committee of top experts, innovators, and policymakers will evaluate and select proposals based on originality and potential for impact.

About Indian Council of Medical Research (ICMR):

- **Origin:** Founded in 1911 as the Indian Research Fund Association (IRFA), it was renamed ICMR in 1949.
- **Ministry:** Operates under the Ministry of Health and Family Welfare, Government of India.
- **Aim:** To advance biomedical research, aiming to improve public health and address national health challenges.
- **Functions:**
 - Formulates, coordinates, and promotes biomedical research.
 - Conducts and supports medical research benefiting society.
 - Facilitates the translation of medical research into public health applications.
- **Vision:** “Translating Research into Action for Improving the Health of the Population.”

Insta links:

- 2. ICMR

23. VACCINE-DERIVED POLIOVIRUS

Context:

WHO faced scrutiny over its handling of polio data, particularly its limited transparency on immune-deficiency and

ambiguous vaccine-derived poliovirus cases.

- Recently the ICMR-NIV Mumbai unit confirmed and reported that the **polio case detected in Meghalaya** was a **type 1 vaccine-derived poliovirus**.

About Polio Virus:

- **Definition:** Polio is a highly infectious viral disease primarily affecting children under five, causing paralysis and sometimes death by attacking the nervous system.
- **Types of Polio Virus:**
 - **Wild Poliovirus Types:**
 - **WPV1:** Currently the most common strain.
 - **WPV2:** Eradicated globally.
 - **WPV3:** Declared eradicated in 2019.
 - **Vaccine-derived Poliovirus (VDPV):** Occurs when the weakened virus in the oral polio vaccine (OPV) reverts to a more virulent form, potentially causing outbreaks in under-immunized areas.

Why is WHO not fully transparent?

The WHO registry on polio — wild poliovirus and vaccine-derived poliovirus — is at best sketchy



Problematic: As long as OPV is used, vaccine-associated and vaccine-derived poliovirus cases will be reported. SPECIAL ARRANGEMENT

- 1 The WHO registry has data of wild poliovirus and circulating vaccine-derived poliovirus (cVDPV) cases alone. It does not have data of iVDPV and aVDPV
- 2 Even the case of the circulating VDPV cases, the WHO registry does not classify the cases into type-1, type-2 and type-3

3 The GPEI database too has data of only wild poliovirus and circulating VDPV cases in individuals and environmental samples

4 The GPEI database classifies the circulating VDPV cases as type-1, type-2 and type-3

5 The GPEI database has data of circulating VDPV cases and environmental samples for only 2021 to 2024

6 GPEI maintains a registry of iVDPV cases but does not make the data publicly available

7 GPEI periodically publishes a list of iVDPV cases. The last time GPEI published the data was in July 2020

- **Vaccines:**
 - **Oral Polio Vaccine (OPV):** Contains weakened virus, given at birth, with additional doses at 6, 10, and 14 weeks, and a booster at 16-24 months.
 - **Inactivated Polio Vaccine (IPV):** Administered with DPT in the Universal Immunization Programme (UIP) as a booster for added immunity.
- **Vaccine-derived Poliovirus (VDPV):**
 - **Circulating VDPV (cVDPV):** Develops in under-immunized populations when the vaccine strain spreads and mutates.
 - **Immune-deficiency VDPV (iVDPV):** Can occur in immune-deficient individuals who carry and excrete the virus for extended periods.
 - **Ambiguous VDPV (aVDPV):** Cases that do not fit into cVDPV or iVDPV categories.
- **Transmission:** Primarily through the fecal-oral

route, the virus multiplies in the intestine, allowing it to invade the nervous system.

- **Global Eradication Efforts:** Multiple rounds of OPV immunization are recommended to stop cVDPV transmission, with high-quality immunization campaigns being critical.
- **India's Status:** Declared polio-free by WHO in 2014, with the last wild polio case reported in 2011.

Insta links:

1. World-polio-day

Energy

24. MILLIMETER WAVE TRANSCEIVER

Context:

The Centre for Development of Telematics (C-DOT) has signed an agreement with the IIT Roorkee to develop a **Millimeter Wave Transceiver** aimed at improving 5G connectivity in rural areas under the **Telecom Technology Development Fund (TTDF)** scheme.

About Millimeter Wave Transceiver Technology:

| Aspect | Description |
|----------------------|--|
| What is it | A device used to transmit and receive signals in the millimeter wave (mmWave) frequency range (30-300 GHz), enabling high-speed wireless communication for applications like 5G. |
| How it works | Uses small cells to emit high-frequency mmWaves that provide fast data rates over short distances; small cells are placed in clusters to ensure continuous coverage. |
| Advantages | - High data rates and bandwidth |
| | - Low latency |
| | - Less interference with other systems |
| | - Compact antennas for IoT compatibility |
| Disadvantages | - Increased data capacity |
| | - Limited range; blocked by physical objects |
| | - Prone to signal degradation from rain, humidity, and obstructions |
| | - Higher manufacturing costs and need for clustered cells |

About Telecom Technology Development Fund (TTDF):

- **Origin:** Previously called the Universal Service Obligation Fund Scheme.
 - Was established by the **Indian Telegraph (Amendment) Act, 2003**
- **Aim:** To support R&D in telecom tech, enable affordable broadband and mobile services in rural/remote areas, and foster synergies between start-ups, academia, and industry.
- **Ministry:** Department of Telecommunications, Ministry of Communications.
- **Features:**
 - Provides grants to Indian entities for telecom innovation and indigenous manufacturing.
 - Encourages Intellectual Property creation, technology co-innovation, and reduced imports.
 - Supports the telecom ecosystem, including standards development, design, prototyping, and testing.

Insta Links:

1. The-communication-system-in-india

25. GRAVITY ENERGY STORAGE

Context:

As climate change intensifies, transitioning to renewable energy is crucial, with solar energy offering abundant yet intermittent supply. Gravity energy storage is emerging as a sustainable solution to stabilize power grids, providing an alternative to batteries.

About Gravity Energy Storage:

- **What it is:** A renewable energy storage technology that uses gravitational force to store and release energy, especially suitable for grid-scale applications.
- **How It works:**
 - During excess energy generation, a heavy mass (water, concrete, or compressed earth blocks) is lifted, converting electrical energy into stored potential energy.
 - When energy demand rises, the mass is released, descending to drive water through a turbine, generating electricity.
- **Advantages:**
 - **Longevity:** Lasts for decades with minimal maintenance compared to battery systems.
 - **Environmentally friendly:** No harmful chemicals; reduces disposal and environmental impact.
 - **Cost-effective:** Offers lower lifetime energy and storage costs for large-scale appli-

cations.

- **Flexible deployment:** Can be used in areas unsuitable for pumped-hydro or large battery systems, such as urban or constrained environments.
- **Limitations:**
 - **Early Development Stage:** High initial setup costs and regulatory challenges.
 - **Geographic limitations:** Requires suitable locations for large infrastructure.
 - **Limited energy density:** While effective for grid storage, less efficient for compact or smaller-scale applications compared to batteries.

Insta Links:

1. Renewable-energy

26. SHANAN HYDROPOWER PROJECT

Context:

The Himachal Pradesh government has intensified efforts to reclaim the 110 MW British-era Shanan Hydropower Project from Punjab, asserting its rightful ownership over the project.

About Shanan Hydropower Project:

- **Established:** Commissioned in 1932, it is India's first megawatt-capacity hydroelectric project.
- **Location:** Joginder Nagar in Mandi district, Himachal Pradesh.
- **River:** Built on the Uhl River, a tributary of the Beas.
- **Issue:** Leased to Punjab for 99 years in 1925, the agreement ended in March 2024; Himachal Pradesh seeks ownership now, arguing that the land originally belonged to it.
- **Present Status:** Under Punjab's control, Himachal is seeking support from the Centre to secure the project's transfer.

Insta Links:

1. Shanan-hydropower-project
2. Haryana-Punjab-dispute

Environment & Ecology

27. ILLEGAL SAND MINING

Context:

Villagers from **Assam and Meghalaya**, particularly along areas with ongoing inter-state boundary disputes, have united against illegal sand mining that threatens the local ecosystem, livelihoods, and road infrastructure.



About Rivers in news:

- **Kolong River (Assam)**
 - **Location:** Morigaon district, Assam
 - **Joins:** The Brahmaputra River
 - **Significance:** The Kolong is a major distributary of the Brahmaputra and is impacted by sand mining activities in Morigaon, affecting the local ecosystem and road conditions.
- **Dudhnoi (Manda) River (Meghalaya-Assam border)**
 - **Location:** Along the Assam-Meghalaya border, especially near Nokmakundi and surrounding villages
 - **Joins:** Eventually joins the Brahmaputra River
 - **Significance:** It is a primary site for illegal sand mining in the North Garo Hills region, leading to erosion and water scarcity for cultivation.
- **Kulsi River (Assam)**
 - **Location:** Kamrup district, Assam
 - **Joins:** Flows into the Brahmaputra River
 - **Significance:** The Kulsi is a habitat for the endangered Gangetic dolphin, with illegal sand mining contributing to habitat loss and ecosystem disruption.
- **Morakolohi River (Assam)**
 - **Location:** Chamaria area, near Puthimari village, Kamrup district, Assam
 - **Joins:** Feeds into the Brahmaputra system
 - **Significance:** A hotspot for high-speed sand extraction using pump motors, affecting the river's sustainability and endangering aquatic species.

Insta Links:

1. Assam-floods-why-ganga-brahmaputra-region-is-flood-prone

28. RC MORRIS REPORT & KODO MILLET

Context:

The deaths of 10 elephants in Madhya Pradesh's Bandhavgarh Tiger Reserve have brought renewed attention to a **1934 report by zoologist RC Morris** on similar fatalities of elephants in Tamil Nadu.

About RC Morris Report:

- **Origin:** Written by RC Morris, Fellow of the Zoological Society, in 1934, documenting 14 elephant deaths due to kodo millet poisoning in Tamil Nadu's Vannathiparai Reserve Forest.
- **Antidotes:** The report proposed tamarind water and buttermilk as effective remedies for kodo millet poisoning, which are now being reconsidered in the recent Bandhavgarh case.
- **Significance:** This historical document offers insights into early knowledge of millet toxicity and practical antidotes, drawing connections to recent elephant fatalities from possible mycotoxins associated with kodo millet.

About Varagu (Kodo Millet):

- **Definition:** A drought-resistant millet known as kodo or varagu in India, primarily cultivated in dry regions for food and fodder.
- **Geographic spread:** Grown across India, particularly in states like Madhya Pradesh, Tamil Nadu, and Chhattisgarh, as well as in Pakistan, Thailand, and parts of Africa.
- **Nutritional value:** Known for high fibre, antioxidant properties, and as a gluten-free option beneficial to health, especially among economically weaker sections.
- **Toxicity risks:** Vulnerable to fungal contamination under specific environmental conditions, leading to **cyclopiazonic acid (CPA) toxin** production, which causes "kodo poisoning" with serious symptoms in humans and animals.

About Bandhavgarh Tiger Reserve:

- **Location:** Situated between the Vindhyan and Satpura ranges in Madhya Pradesh.
- **Status:** Designated a national park in 1968, it gained Tiger Reserve status in 1993.
- **Topography:** Known for valleys, hills, and plains with the historic Bandhavgarh Fort, associated with Lord Rama and his brother Lakshmana, prominently located.
- **Vegetation:** Features tropical moist deciduous forests, including sal, mixed forests, and grasslands, with bamboo on the lower slopes.
- **Flora:** Includes notable species like Saj (*Terminalia tomentosa*), Dhaora (*Anogeissus latifolia*), Arjun (*Terminalia arjuna*), and Amla (*Emblica officinalis*).

- **Fauna:** Hosts the Royal Bengal Tiger noted for the highest density of tiger population in India and globally.

NOTE: This topic is very important from a preliminary point of view. Make a note of the RC Morris report (year, state, anecdote suggested) and note down about Kodo Millet too.

Insta Links:

1. International-year-of-milletts-IYM-2023

29. FOAM IN YAMUNA RIVER

Context:

In preparation for Chhath Pooja, Delhi has faced recurring debates and actions around the toxic foam in the Yamuna River, where devotees gather for rituals.

Why Does Foam Occur in the Yamuna River?

- **Pollutant accumulation:** The river's lean flow during winter time reduces the natural dilution of pollutants, allowing them to concentrate.
- **Detergents:** The main contributors to foaming are **phosphates** from detergents used in domestic and industrial activities. These chemicals lead to surfactant buildup in the water.
- **Industrial effluents:** Discharge from industries upstream also contributes chemicals that create foam.
- **Bacteria activity:** Anaerobic bacteria act on the pollutants, especially as water falls from heights, such as at the Okhla barrage, aiding foam formation.
- **Seasonal changes:** The onset of **winter reduces oxygenation**, aggravating the foaming.

About Defoaming Process:

- **Defoamer solution:** A **polyoxypropylene-based defoamer**, approved by the US FDA, is used to suppress foam effectively without harming water quality.
- **Dilution ratio:** The defoamer is diluted at a ratio of 1:100, minimizing any adverse effects from constituents like silicone.
- **Ecological safety:** Testing indicated no reduction in dissolved oxygen levels after defoaming, implying it doesn't impact the river's ecology.
- **Temporary solution:** Spraying is focused on the Okhla barrage area, and while effective for short-term foam control, it is **not a permanent fix for pollution**.
- **Monitoring and Approval:** The National Mission for Clean Ganga (NMCG) and other stakeholders oversee the process to ensure eco-friendly application methods.

Insta links:

1. Yamuna-river-and-its-pollution

30. INTERNATIONAL SOLAR ALLIANCE

Context:

The Seventh International Solar Alliance (ISA) Assembly session, held in New Delhi at Bharat Mandapam, concluded with key leadership elections, the review of ISA initiatives, and deliberations on advancing global solar energy adoption.

Recent Outcomes of the ISA Summit:

- **Leadership Elections:** India was unanimously elected President, and France won the contested Co-Presidency against Grenada. Eight Vice Presidents from ISA's regional groups were also selected, including Ghana, Seychelles, Australia, and Germany.
- **Director general appointment:** Ashish Khanna from India was appointed Director General, with goals to strengthen ISA's collaboration and practical implementation of solar goals.
- **Focus areas:** The Assembly discussed key initiatives targeting energy access, security, and transition, focusing on funding requirements and programmatic support.
- **Committees and Governance:** Decisions included enhancing ISA's governance structure with the Standing Committee and Regional Committees to streamline collaboration and action among Member Countries.

About the International Solar Alliance (ISA):

- **Established:** 2015; headquartered in India (first intergovernmental organization headquartered in India).
- **Membership:** 120 Member and Signatory countries, aiming to mobilize \$1 trillion in solar investments by 2030.
- **Mission:** Drive global solar energy adoption to foster sustainable growth, reduce energy costs, and provide universal energy access.
- **Primary goals:** Enhance solar energy in sectors like agriculture, transport, and health; standardize solar policies; and provide solar training and data.
- **Partnerships:** Collaborates with development banks, civil society, private, and public sectors, focusing on support for Least Developed Countries (LDCs) and Small Island Developing States (SIDS).

Insta Links:

1. International-Solar-Alliance

31. MARKHOR

Context:

Efforts are urgently needed to protect the habitat of the endangered Markhor, the world's largest wild goat, to support and increase its population in Jammu and Kashmir.



About Markhor:

- **Scientific name:** *Capra falconeri*
- The UN General Assembly proclaimed **24 May the International Day of the Markhor**, and it is celebrated for the first time in 2024.
- **Distinctive features:** Spiral horns (up to 160 cm in males), thick fur in shades of brown and gray; males weigh 80-110 kg, females weigh 32-50 kg.
- **Habitat:** Mountainous regions at 600-3,600 meters in Pakistan, Afghanistan, India (J&K), and Tajikistan.
- **Diet:** Herbivorous; feeds on grasses, leaves, herbs, and woody plants in winter.
- **Social behavior:** Males often solitary or in small groups, while females and young form larger herds.
- **Threats:** Illegal hunting for horns, habitat encroachment, livestock competition, and climate change effects.
- **Conservation status:** Listed as Near Threatened by IUCN; conservation efforts focus on habitat protection, reducing poaching, and managing livestock competition.

Insta links:

1. Species-in-news

32. COMMISSION FOR AIR QUALITY MANAGEMENT

Context:

Following repeated directives from the Supreme Court to address stubble burning more effectively, the Commission for Air Quality Management (CAQM), has doubled fines

for farmers engaging in this practice.

More about news:

- **Revised Fines for Stubble Burning:**
 - **Farmers with less than two acres:** Increased fine from ₹2,500 to ₹5,000 per incident.
 - **Farmers with between two and five acres:** Fine doubled from ₹5,000 to ₹10,000.
 - **Farmers with more than five acres:** Fine raised from ₹15,000 to ₹30,000.
 - **Implementation:** Nodal officers in Delhi, Punjab, Haryana, and NCR regions of Rajasthan and Uttar Pradesh are authorized to enforce and collect these fines as environmental compensation.

About Commission for Air Quality Management:

- **Origin:** Established under the CAQM Act, 2021 for NCR and adjoining areas, replacing the Environment Pollution (Prevention and Control) Authority (EPCA).
- **Aim:** Coordinate and oversee efforts to improve air quality, prevent and control air pollution in Delhi-NCR and surrounding states (Punjab, Haryana, Rajasthan, Uttar Pradesh).
- **Jurisdiction:** Delhi-NCR, Punjab, Haryana, Rajasthan, and Uttar Pradesh.
- **Powers:**
 - Restrict activities impacting air quality.
 - Conduct research on pollution.
 - Issue binding directions to authorities and individuals.
 - Enforce compliance and take preventive actions.
- **Composition:**
 - Chairperson: Secretary/Chief Secretary rank official.
 - Five ex officio members from Delhi, Punjab, Haryana, Rajasthan, and UP.
 - Three full-time technical members.
 - Members from NGOs and technical bodies like CPCB, ISRO, and NITI Aayog.

Insta Links:

1. CAQM

33. AIRSHIPS

Context:

As climate change drives the need for more sustainable transport options, airships are resurfacing as a viable choice, particularly for cargo transportation.

About Airships:

- **Origin and History:**
 - Developed as the first aircraft capable of powered, controlled flight in the early

20th century.

- Initially seen as the future of travel until airplanes took precedence; notable incidents like the **Hindenburg disaster (1937)** further diminished public trust in airships.
- **How they work:**
 - Operate on the **“lighter-than-air” principle**, utilizing gases like helium (non-combustible) or, earlier, hydrogen (flammable) for lift.
 - Lift occurs as the gas inside the airship is less dense than atmospheric air.
- **Buoyancy challenge:**
 - Variations in buoyancy needed for cargo handling complicate airship operations; previously, releasing and refilling helium was unfeasible due to cost.
 - Innovative solutions involve water ballast or compressed gas systems to adjust buoyancy without excessive helium usage.

Insta Links:

1. Analysis-of-Indias-aviation-sector

34. WORLD'S FIRST CO₂-TO-METHANOL CONVERSION PLANT

Context:

NTPC, India's largest power producer, launched the **world's first CO₂-to-methanol conversion plant** at its Vindhyachal facility, marking a significant advancement in carbon management and green fuel technologies.

About CO₂-to-Methanol Conversion Process:

- Carbon capture: CO₂ emissions from industrial processes are captured directly from flue gases.
- **Catalytic reaction:** The captured CO₂ reacts with hydrogen (produced through renewable sources) using a specialized catalyst developed by NTPC
- **Methanol synthesis:** The reaction occurs under controlled pressure and temperature conditions, producing methanol as the end product.
- **Storage and utilization:** The synthesized methanol is stored and can be used as a fuel or a feedstock for chemicals.

Significance of CO₂-to-Methanol Conversion:

- **Carbon management:** Reduces CO₂ emissions by recycling them into useful products.
- **Green fuel production:** Methanol serves as a cleaner alternative to fossil fuels, supporting India's transition to green energy.
- **Indigenous innovation:** Development of India's first indigenous methanol synthesis catalyst promotes self-reliance in green technologies.

- **Industrial applications:** Methanol is used in fuel blending, chemicals production, and hydrogen generation.
- **Sustainable development:** Aligns with global climate goals and India's commitment to reducing carbon footprints.

Insta links:

1. Carbon-capture-utilisation-and-storage

35. CSE ASSESSMENT

Context:

According to the CSE and **Down To Earth** analysis, 2024 saw a record frequency and severity of such events, disproportionately affecting vulnerable populations, agriculture, and infrastructure.

NOTE: This key data from the CSE report will be more useful for Mains compared to Prelims. While studying this article, please read it from the main perspective more.

Key Highlights of CSE Assessment:

- **Rising frequency of events:**
 - Extreme weather events occurred on **255 of 274 days** in 2024, up from 235 in 2023 and 241 in 2022.
- **Impact on lives:**
 - Deaths increased by **18% in 3 years**, with **3,238 fatalities** in 2024 compared to 2,755 in 2022.
 - Kerala recorded the **highest fatalities (550)**, followed by Madhya Pradesh (353) and Assam (256).
- Agricultural losses:
 - Crop loss spiked by **74%**, with **3.2 million hectares affected** in 2024 compared to 1.84 million hectares in 2022.
 - Maharashtra suffered the largest crop losses (>60%).
- **Infrastructure and Livestock Damage:**
 - **235,862 houses** were destroyed in 2024, a significant increase from 80,293 in 2022.
 - **9,457 livestock** perished, up from 92,519 last year.
- **Regional and State Impact:**
 - Central India had the **highest extreme weather days (218 days)** in 2024.
 - **Madhya Pradesh** recorded the most extreme weather days (176) among states.
 - Andhra Pradesh reported the **most houses damaged** due to extreme weather.
- **Broader implications:**
 - Heatwaves **claimed 210 lives** but underestimated prolonged health impacts.
 - Lack of robust compensation systems for farmers exacerbates poverty and marginalization.

Insta Links:

1. Synthesis-report-of- IPCC AR6

Defence

36. MAHASAGAR

Context:

The Indian Navy recently conducted the **third edition of MAHASAGAR**, a high-level virtual engagement that brought together naval leaders from Indian Ocean Region (IOR) nations.

About MAHASAGAR:

- **Meaning:** "MAHASAGAR" translates to "vast ocean" in Hindi.
 - MAHASAGAR which stands for **Maritime Heads for Active Security And Growth for All in the Region**.
- **Objective:** Strengthen cooperation on maritime security through joint training and capacity-building in the Indian Ocean Region.
- **Participants:** Heads of Navies/Maritime Agencies from 10 IOR littoral nations, including Bangladesh, Maldives, Seychelles, Sri Lanka, and Tanzania.
- **Initiative:** Started by the Indian Navy in 2023, conducted bi-annually as a virtual interaction platform for IOR nations.
- **Focus of Third Edition:** Emphasized collaboration on training to develop skilled manpower and strengthen collective responses to maritime security challenges.

Insta Links:

1. Mahasagar/

37. ONE RANK ONE PENSION

Context:

Prime Minister Narendra Modi commemorated a decade of the **One Rank One Pension (OROP)** scheme, highlighting it as a tribute to the dedication and sacrifices of India's veterans and ex-service personnel.

10 years of OROP

A Milestone for Empowering Ex-Servicemen

Total Financial Implication for 2024-2025 - ₹4,468.83 Crore (From July 2024 to February 2025)

Disbursement to Pensioners till 30 September, 2024 - ₹895.53 Crore

OROP EXPENDITURE SERVICE PENSIONERS :LAST 10 YEARS

| Year | Expenditure OROP-I (Rs Cr) | Expenditure OROP-II (Rs Cr) | Expenditure OROP-III (Rs Cr) |
|------|----------------------------|-----------------------------|------------------------------|
| 2014 | 2000.00 | 0.00 | 0.00 |
| 2015 | 5500.00 | 0.00 | 0.00 |
| 2016 | 6500.00 | 0.00 | 0.00 |
| 2017 | 7000.00 | 0.00 | 0.00 |
| 2018 | 7500.00 | 0.00 | 0.00 |
| 2019 | 8000.00 | 1500.00 | 0.00 |
| 2020 | 8500.00 | 2500.00 | 0.00 |
| 2021 | 9000.00 | 3500.00 | 0.00 |
| 2022 | 9500.00 | 4500.00 | 0.00 |
| 2023 | 10000.00 | 5500.00 | 0.00 |
| 2024 | 7500.00 | 3500.00 | 1000.00 |

@SpokespersonMoD @DefenceMinIndia MinistryofDefenceGovernmentofIndia

About One Rank One Pension (OROP) Scheme:


- **Definition:** OROP ensures that uniform pensions are paid to personnel retiring in the same rank with identical service lengths, regardless of when they retired.
- **Implementation year:** The government approved OROP in 2015, with benefits retroactively effective from July 1, 2014.
- **Pension Re-fixation:** Pensions are re-fixed based on the average of the minimum and maximum pensions of 2013 retirees of the same rank and service length.
- **Arrears:** Arrears are paid in four half-yearly instalments, except for family pensioners and Gallantry awardees, who receive it in one instalment.
- **Future revisions:** Pensions will be re-fixed every five years.
- **Nodal agency:** Department of Ex-Servicemen Welfare, Ministry of Defence.
- **Payment:** Integrated within the standard pension, not a separate component.
- **Exclusions:** Personnel discharged voluntarily under specific military rules post-OROP implementation are not eligible.

Insta links:

1. OROP

MAPPING

INTERNATIONAL

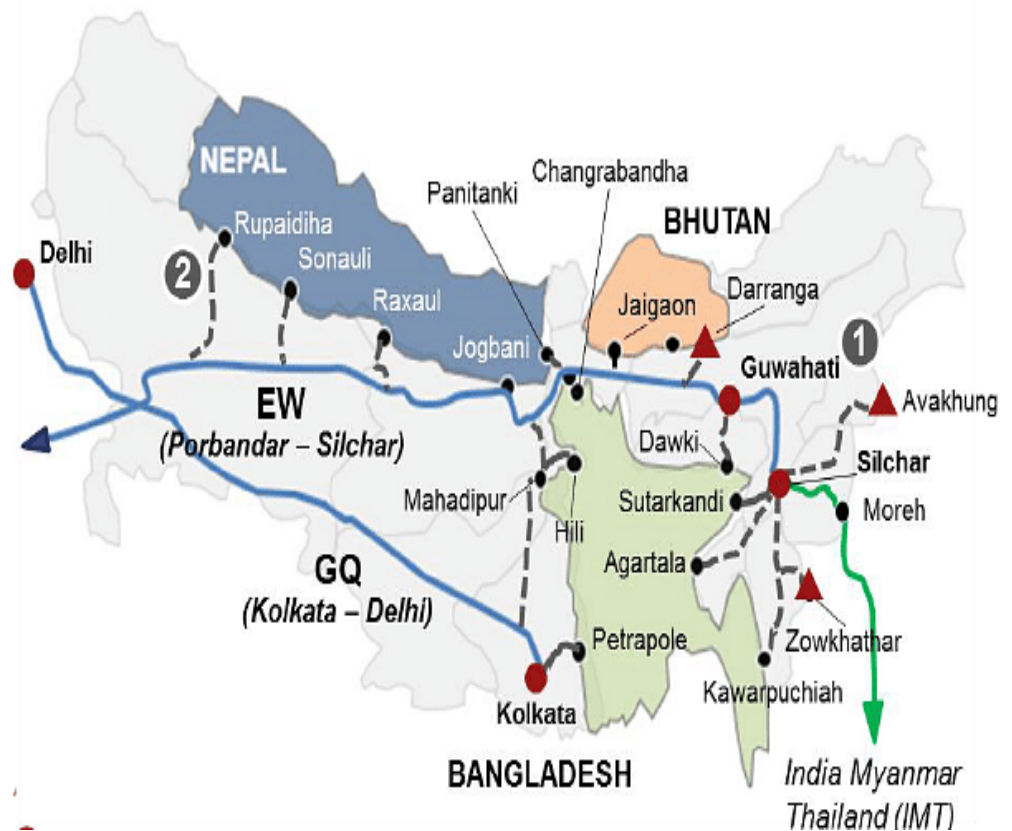
| Place | Why in News? | |
|---|--|---|
| <p>1. MOUNT LEWOTOBI LAKI-LAKI</p> | <p>Context: Mount Lewotobi Laki-Laki erupted in southeastern Flores, Indonesia, triggering earthquakes, fatalities, property damage, and mass evacuations.</p> <p>About Lewotobi Laki-Laki:</p> <ul style="list-style-type: none"> • Location: Situated on Flores Island, southeastern Indonesia. • Twin volcano: Part of the Lewotobi twin volcano complex, comprising Lewotobi Laki-Laki (Male) and Lewotobi Perempuan (Female) stratovolcanoes. • Geological significance: Positioned within the “Ring of Fire,” a region known for intense tectonic activity. • Eruption details: Recently erupted, emitting lava and ash, causing significant damage to surrounding villages and resulting in multiple fatalities. • Safety measures: Authorities advised residents to stay at least 7 km away from the volcano due to the risk of further eruptions and earthquakes. • Previous names: Historically referred to as Lobetabi, Lovotivo, and Loby Toby. <p style="text-align: center;">Indonesia volcano</p>  <p>Insta links:</p> <table border="1" style="width: 100%;"> <tr> <td> <ol style="list-style-type: none"> 1. Places-in-news 2. Mount-Ruang-Indonesia </td> </tr> </table> | <ol style="list-style-type: none"> 1. Places-in-news 2. Mount-Ruang-Indonesia |
| <ol style="list-style-type: none"> 1. Places-in-news 2. Mount-Ruang-Indonesia | | |

2. LAND PORT DARRANGA

Context: The Immigration Check Post (ICP) at Land Port Darranga in Assam’s Tamulpur district, located just 700 meters from the Indo-Bhutan border, is set to be inaugurated.

About Darranga Check Post:

- **Location:** Positioned near the Indo-Bhutan border, only 700 meters from Bhutan, in Assam’s Tamulpur district.
- **Facilities:** Spans 14.5 acres with advanced infrastructure for efficient cross-border travel and trade.
- **Connectivity:** Benefits from proximity to National Highway 27 and Bhutan’s enhanced customs facilities.
- **Economic impact:** Expected to catalyze trade expansion, benefiting India’s development goals and Bhutan’s industrial output.
- **Significance:** Acts as both a commercial hub and an immigration check-point, fostering economic and cultural ties between India and Bhutan.



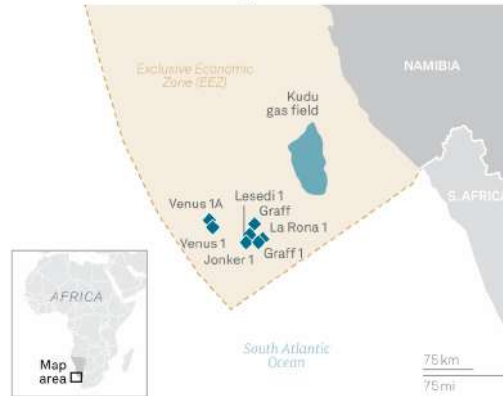
Insta links:

1. [India-Bhutan-relations](#)

3. NAMIBIA OFFSHORE OIL

Context: Namibia, viewed as one of the last frontiers of untapped oil potential, has recently faced challenges in its journey to becoming a prolific oil producer. Despite significant offshore discoveries in recent years, an unexpectedly high gas-to-oil ratio in these fields has created complications for oil development.

Namibia's offshore oil and gas discoveries



About Namibia and Its Oil Reserve Locations

- **Orange Basin:** Major discoveries have been made here, contributing significantly to Namibia's estimated 2.6 billion barrels of oil reserves.
- **Luderitz Basin:** Another prospective area along the Namibian coast known for its oil exploration potential.
- **Kavango Basin:** Inland exploration in this area has generated interest for its untapped reserves.
- **Walvis Basin:** Also, a target for oil exploration, adding to Namibia's appeal as a new frontier for oil production.

NOTE: All these places were in the news in 2024; hence, try to remember these names and why they were in the news. Also, the image contains more location names; kindly remember their names too.



About Namibia:

- **Location:** Situated on the southwestern coast of Africa in the Southern and Eastern Hemispheres.
- **Borders:** Neighboring countries include South Africa, Botswana, Zimbabwe, Zambia, and Angola; bordered by the Atlantic Ocean to the west.
- **Topography:**
 - **Namib Desert:** Stretches along the western coast.
 - **Central Plateau:** Located inland, transitioning from the coastal desert.
 - **Kalahari Desert:** Positioned further east.
- **Rivers:** Permanent rivers include the Kunene, Okavango, Mashi, Zambezi (north), and Orange River (south).
- **Mountain:** Brandberg, Namibia's highest peak, lies on the plateau's western edge.

Insta links:

2. [Namaqualand-Africa](#)

4. CARICOM (CARIBBEAN COMMUNITY AND COMMON MARKET)

Context:

The second meeting of the India-CARICOM Joint Commission was held virtually to review and strengthen the multifaceted relationship between India and CARICOM.

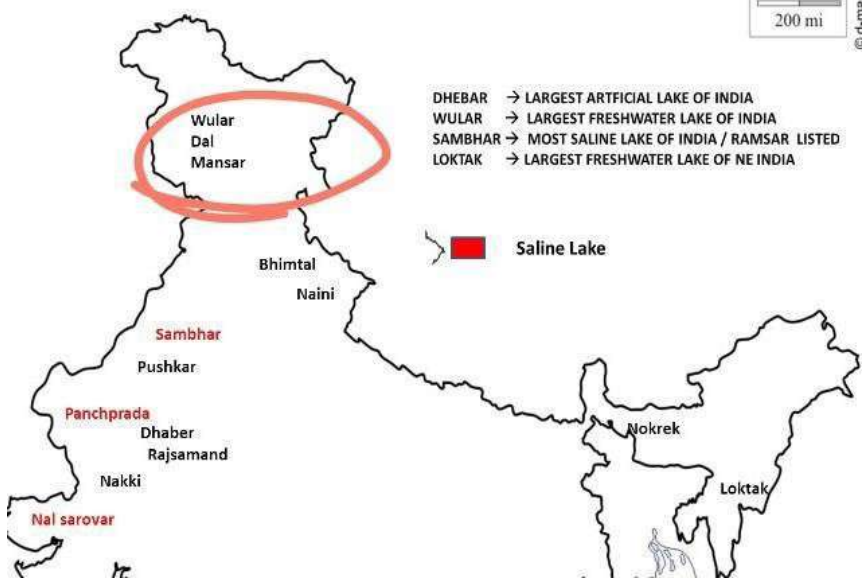


About CARICOM (Caribbean Community and Common Market):

- **Origin:** Established in 1973 by the Treaty of Chaguaramas.
- **Aim:**
 - **Economic Integration:** Promote integration and cooperation among member states.
 - **Equitable Benefits:** Ensure fair sharing of the benefits of integration.
 - **Foreign Policy Coordination:** Develop a unified approach to foreign relations.
- **Nations involved:**
 - **15 full members:** Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago.
 - **Associate members:** Anguilla, Bermuda, British Virgin Islands, Cayman Islands, Turks and Caicos Islands.
- **Secretariat:** Located in Georgetown, Guyana.
- **Chairmanship:** Rotates every six months among the Heads of Member States.

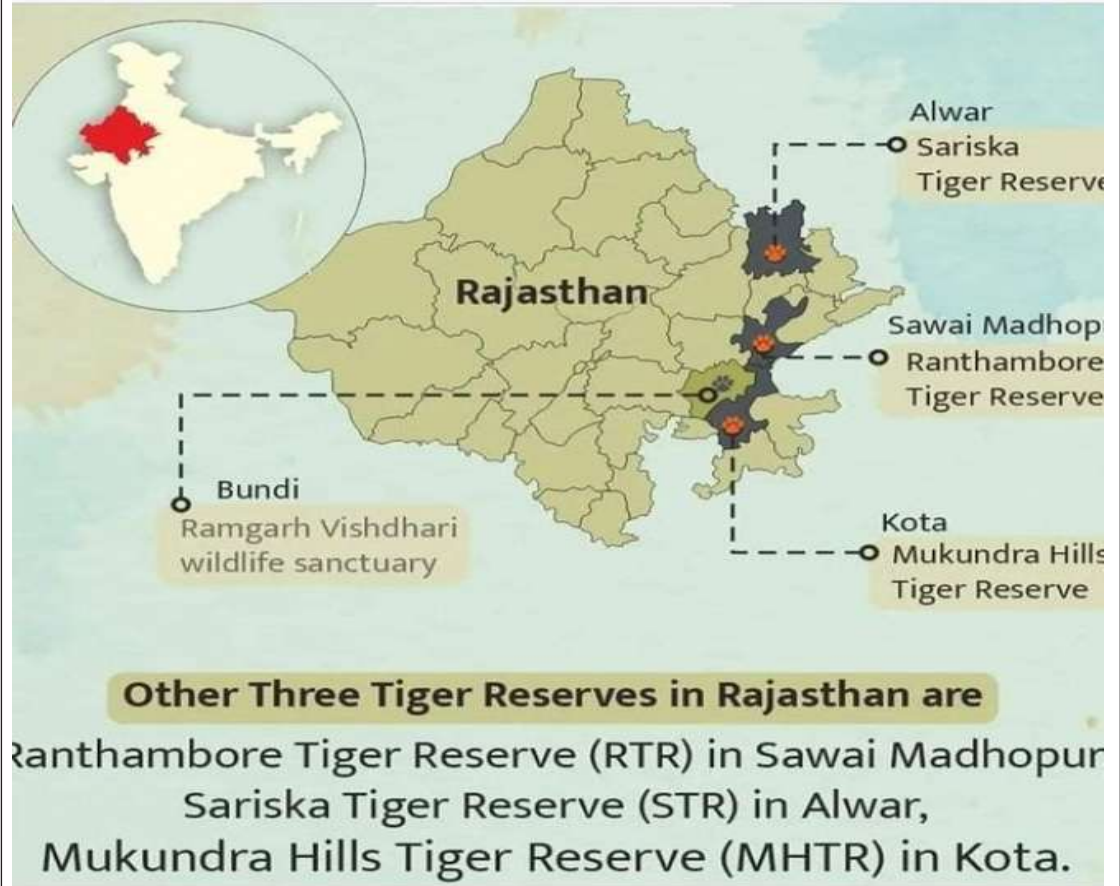
Insta Links:

2. [India - CARICOM](#)

| Place | Why in News? |
|---------------------------|--|
| <p>5. DAL LAKE</p> | <p>Context: In a historic event, 150 women participated in the first-ever traditional shikara boat race on Dal Lake in Srinagar, breaking societal norms and showcasing their strength.</p>  <p>About Dal Lake:</p> <ul style="list-style-type: none"> • Location: Situated in Srinagar, Jammu and Kashmir, surrounded by the Pir Panjal mountains. • Nicknames: Known as the “Jewel in the crown of Kashmir” and “Srinagar’s Jewel.” • Size and Structure: The lake spans 18 square kilometers, part of a natural wetland of 21.1 square kilometers, including floating gardens. • Floating Gardens: Called “Raad” locally, these bloom with lotus flowers during July and August. • Basins: Divided into four basins—Gagribal, Lokut Dal, Bod Dal, and Nagin (often considered a separate lake). • Shoreline: Extends 15.5 kilometers with Mughal gardens, parks, houseboats, and hotels along the boulevard. • Floating Market: Known for its vibrant floating market where vendors sell goods from wooden shikaras. • Depth: Varies from 6 meters at the deepest point to 2.5 meters at the shallowest. • Winter Freeze: Temperatures can drop to -11°C in winter, causing parts of the lake to freeze. • Islands: Includes three islands, with Char Chinari (Four Chinaris) and Sone Lank (Gold Island) being notable for their historical and scenic significance. <p>Insta links:</p> <ol style="list-style-type: none"> 1. Dal-lake-area-to-be-eco-sensitive-zone 2. Places-in-news |

6. RANTHAMBORE NATIONAL PARK

Context: As many as 25 tigers, out of a population of around 75 in the tiger reserve in Ranthambore National Park (RNP) in Rajasthan, have “disappeared” within the last year.



Issues in Ranthambore Tiger Reserve:

- **Overpopulation:** RNP currently holds around 75 tigers in a space suitable for about 40, leading to intense competition.
- **Territorial Conflicts:** Due to overcrowding, many tigers engage in territorial disputes, sometimes resulting in fatal conflicts.
- **Human-Wildlife Conflict:** The proximity of villages in the buffer zone exacerbates human-tiger conflicts, creating challenges for coexistence.
- **Insufficient Monitoring:** Monitoring gaps, as revealed by missing tigers in camera traps, have underscored the need for consistent surveillance.
- **Delayed Relocation:** Slow relocation efforts of villages around RNP have hampered mitigation of human-animal conflicts.

About Ranthambore Tiger Reserve (RTR):

- **Location:** At the junction of the Aravallis and Vindhyas in eastern Rajasthan, near Sawai Madhopur.
- **Area:** Spans 1,411 sq. km, one of northern India’s largest tiger reserves.
- **History:** Former royal hunting grounds for Jaipur’s Maharajas.
- **Geography:** Features steep rocky hills, lakes (Padam Talab, Raj Bagh Talab), and rivers Chambal and Banas, with the Great Boundary Fault.
- **Flora:** Tropical dry deciduous and thorn forests; dominated by Dhok trees and grasslands.
- **Fauna:** Hosts tigers, leopards, sloth bears, hyenas, and over 250 bird species.

Insta links:

3. [Places-in-news](#)