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GENERAL STUDIES – 1

Topics: Important Geophysical phenomena such as earthquakes, Tsunami, Volcanic activity, cyclone etc., geographical features and their location- changes in critical geographical features (including water-bodies and ice-caps) and in flora and fauna and the effects of such changes.

1. ATMOSPHERIC RIVERS: 'FLYING RIVERS' CAUSING DEVASTATING FLOODS

Context:

Heavy rains and floods have recently affected several parts of India, killing scores and displacing thousands. These floods are exacerbated by **“flying rivers,” or atmospheric rivers.**

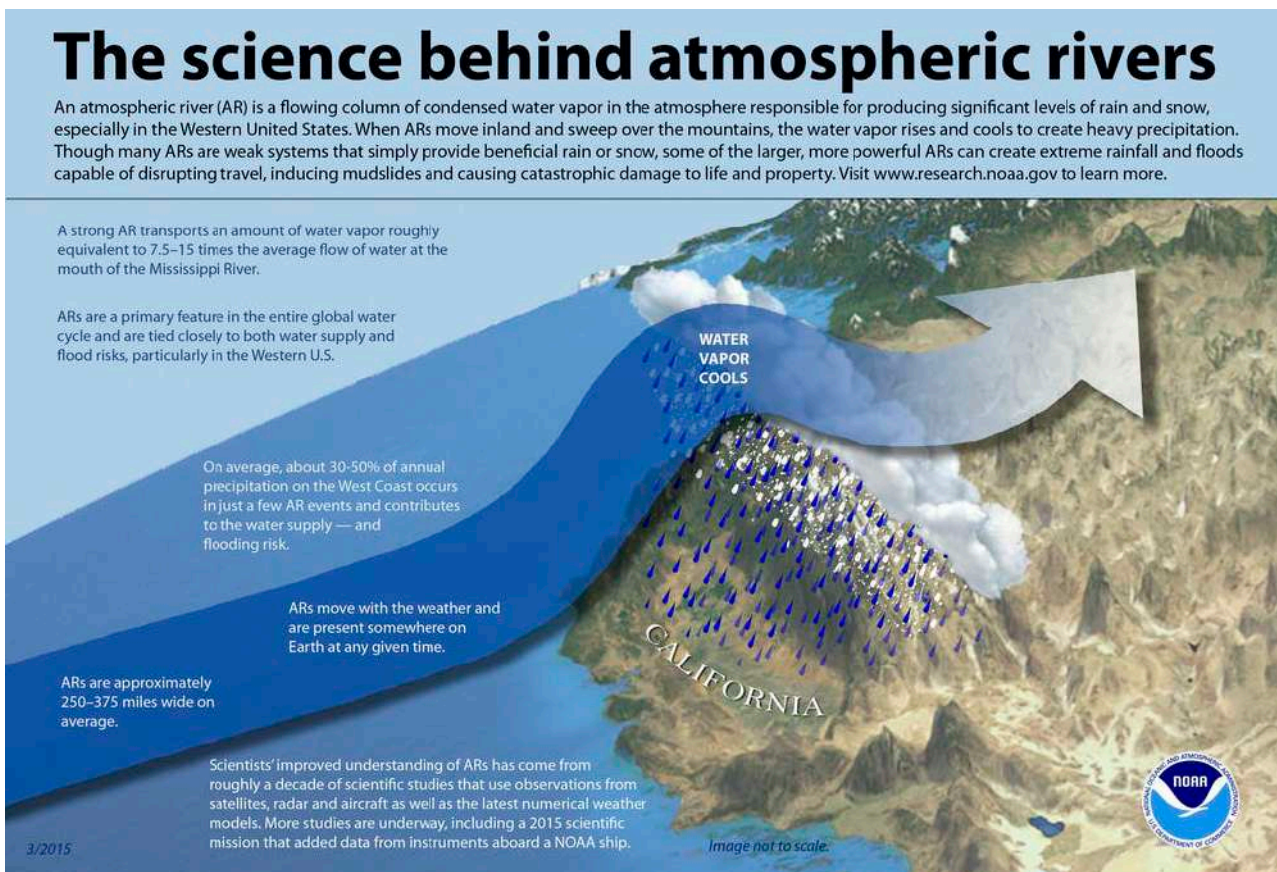
What are Atmospheric rivers?

These are **long, narrow bands of water vapour** in the atmosphere that transport moisture from the tropics to other regions. These **“rivers in the sky”** can be thousands of kilometres long and hundreds of kilometres wide, carrying large amounts of water vapour. When they make landfall, **they can release this moisture as heavy rain or snow,** often leading to significant flooding and other weather-related impacts.

Atmospheric rivers occur globally, affecting the west coasts of the world’s major landmasses. A well-known example is the **“Pineapple Express,”** a strong atmospheric river that is capable of bringing moisture from the tropics near Hawaii over to the U.S. West Coast.

The main characteristics or defining features of the Atmospheric Rivers

1. **A shape that is long and narrow,** no more than **400 to 500 Km wide,** and extending for thousands of Kilometres sometimes across entire ocean basins.
2. Wind speeds of greater than **12.5 meters per second** in the lowest 2 km.
3. Very thick **Integrated Water Vapour** concentrations.
4. These **narrow plumes of enhanced moisture transport** occur in the lower troposphere in the low-level jet region (within the warm sector) of extra-tropical cyclones.



Mechanism of precipitation from Atmospheric rivers (Ars)

Heavy rainfall can result, especially when ARs make landfall because of the **convergence and thus vertical uplift within** an AR, and most significantly when the moisture-laden air is forced to rise over mountains. E.g. near the Rockies on the western coast of America

Impact of Atmospheric rivers in the world

ARs are a major cause of extreme precipitation and severe flooding in mid-latitude, westerly coastal regions such as the West Coast of North America, Western Europe, and the west coast of North Africa. Over 80% of flooding damages in Western USA are linked to ARs. **More than 80% of all flooding damages in the Western part of the USA** are associated with atmospheric rivers.

Impact of Atmospheric Rivers in India

- Eastward-moving cyclonic circulations** in the northern latitudes of India in conjunction with the **atmospheric rivers drawing water vapour from the lower latitudes** under the circumstances of positive interference result in extremely heavy and intense precipitation over the higher reaches of northern India.
- Atmospheric Rivers result in heavy precipitation** when they confront mountainous terrain, such as those found in the Himalayan ranges of North India for example:
 - 2010, Leh in the Ladakh region of Jammu and Kashmir** experienced a cloud burst, and the heavy rains that followed triggered flash floods and mudslides
 - 2011 Kupwara District in J&K** experienced heavy rainfall. Rain or thundershowers occurred in a large number of places across the country.

Data:

A study found that between **1951 and 2020, India experienced 574 atmospheric rivers** during the monsoon season, with their frequency and intensity increasing due to climate change.

Benefits of Atmospheric Rivers:

- Water Supply:** Despite the hazardous effects of ARs, they can also be beneficial **by providing precipitation** which is essential for water supply and resources.
 - Over the west coast of the USA, for example, ARs are thought to provide an **average of 30–50% of annual precipitation** and have been responsible for ending 33–74% of droughts in the region.
- Maintaining Hydrological Balance:** Atmospheric rivers transport water vapour from the tropics to higher latitudes, redistributing moisture and supporting ecosystems and agriculture.

Way forward to deal with the challenges of atmospheric rivers

- Improving atmospheric forecasting systems** should be a priority
 - A better understanding of atmospheric rivers' intensity, duration, and landfall locations can provide valuable information to residents and emergency responders.
- It also is important to **discourage new construction in high-risk areas** and help people move to safer locations after major disasters, rather than rebuilding in place.

Conclusion

As there is a direct relationship between the intensity of atmospheric rivers the climate change and they are getting stronger with the changed climate pattern, the solution lies in reducing global greenhouse gas emissions. Thus stabilizing the global climate system is the only long-term way to minimize economic damage and risk to vulnerable communities arising from the atmospheric rivers.

Mains Link:

Q. How does the cryosphere affect global climate? (UPSC 2017)

Prelims Link:

Q. The formation of an ozone hole in the Antarctic region has been a cause of concern. What could be the reason for the formation of this hole? (UPSC 2011)

- Presence of prominent tropospheric turbulence; and inflow of chlorofluorocarbons
- Presence of prominent polar front and stratospheric clouds; and inflow of chlorofluorocarbons
- Absence of polar front and stratospheric clouds; and inflow of methane and chlorofluorocarbons
- Increased temperature in polar region due to global warming

Ans: (b)

GENERAL STUDIES – 2

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

1. SUPREME COURT RULING ON SUB-CLASSIFICATION OF SCS AND STS

Context:

On August 1, 2024, the Supreme Court of India ruled in the case of State of Punjab and Ors Vs Davinder Singh and Ors that **states can sub-classify Scheduled Castes (SCs) and Scheduled Tribes (STs)** to grant additional quotas for the more disadvantaged within these categories.

Timeline of the case:

Timeline	Description
Supreme Court in EV Chinniah case (2005)	The court held that Scheduled Castes (SCs) under Article 341(1) formed a homogeneous group and could not be subdivided Under Article 341(1), the President designates SCs in states and union territories.
Punjab Scheduled Caste and Backward Classes Act, 2006	It mandated that 50% of vacancies reserved for SCs in direct recruitment be offered to Balmikis and Mazhabi Sikhs, contingent on their availability.
Punjab High Court Ruling (2010)	The Punjab and Haryana High Court (2010) struck down the provision of the Punjab act based on the EV Chinniah ruling, which relied on Article 341, stating that only the President can classify SCs.
SC in State of Punjab v. Davinder Singh (2020)	The sub-classification issue of Scheduled Castes (SCs) was referred to a seven-judge bench from a five-judge bench

Historical Context:

- Indra Sawhney Case (1992):** Established the ‘creamy layer’ concept for Other Backward Classes (OBCs) to ensure benefits reach the most disadvantaged.
- Differences from SC/ST:** The creamy layer concept has traditionally been applied to OBCs, and its adaptation to SC/ST groups is complex due to historical caste injustices.

What did the 7 judge bench of SC order now?

- Judgment Overview:**
 - Sub-Classification Allowed:** States can now create sub-categories within SCs and STs for more targeted reservations.
 - Creamy Layer Inclusion:** The Court emphasized the need to exclude the ‘creamy layer’—more advantaged members—within SC and ST groups from affirmative action benefits.
 - Empirical Study Requirement:** States must conduct studies before implementing sub-classification, and their decisions are subject to judicial review.
- Potential Criteria for SC/ST Creamy Layer:**
 - Educational and Socio-Economic Factors:** The criteria may include educational background, similar to the OBC model but adjusted for SC/ST contexts
- The state cannot earmark 100% reservation** for a sub-class while allowing sub-classification
- The State’s power to sub-classify is **subject to judicial review.**
- Sub-classification does not violate the principle of equality** enshrined under Article 14 and the President’s exclusive authority under Article 341 to identify SCs.

Constitutional Provision: Competence of States for Creating Sub-Classification

States have the authority to provide reservation benefits to SCs and STs under **Articles 15(4) and 16(4), and Articles 341(1) and 342(1).**

- Article 15(4) empowers states to create special arrangements for socially and educationally backward

- classes like SCs and STs.
2. Article 16(4) allows States to make provisions for reservation in promotion if SCs and STs are under-represented in state services.
 3. Articles 341(1) and 342(1) permit the President, with consultation, to specify SCs and STs, including parts of these groups.

Sub-categorize Scheduled Castes and Scheduled Tribes are needed:

1. Addressing Intra-Group Inequalities: E.g., In Telangana, the Madiga Reservation Porata Samiti (MRPS) is advocating for the internal reclassification of Scheduled Caste reservations. Despite constituting around 50% of the SC population in the state, Madigas feel their representation is being overshadowed by the dominance of another SC community, the Malas.
2. Equitable Distribution of Benefits: It prevents the concentration of benefits in the hands of a few dominant groups and promotes broader social inclusion.
3. Constitutional Mandate: Articles 15(4), 16(4), 341(1), and 342(1) of the Constitution empower states to create special arrangements and provisions for the welfare of socially and educationally backward classes, including SCs and STs
4. Empowerment of State Governments: Sub-categorization grants autonomy to state governments to tailor reservation policies according to the specific socio-economic conditions and needs of different sub-groups within SCs and STs, promoting localized and targeted affirmative action measures.
5. Enhancing Social Mobility: Sub-categorization enables targeted measures to empower disadvantaged groups, fostering social mobility through education, employment, and political representation.

Challenges with Sub-Categorization of Caste:

1. Inequality within Scheduled Castes: Sub-categorization may not effectively address disparities, as the most backward communities may still remain marginalized despite a separate quota.
2. Federalism Issue: There's a constitutional dilemma regarding the authority of states to sub-categorize SCs and STs, with conflicting judgments from the Supreme Court on whether states have this power.
3. Identification and Criteria: Determining criteria for sub-categorization, such as socio-economic status or educational attainment, poses challenges due to the lack of consensus.
4. Data Accuracy: Obtaining accurate socio-economic data for different communities is difficult, hindering the decision-making process.
5. Intra-group Disputes: Sub-categorization may lead to internal conflicts and tensions among SC communities, potentially marginalizing certain groups from benefits.
6. Possibility of Fragmentation: There's a risk that sub-categorization could weaken the collective identity and strength of the community, leading to political and social fragmentation.

Suggestions for Sub-Classifying Caste Groups:

1. Need for Wider Reading of Article 341: Article 341 does not prohibit sub-classification, allowing states to provide special measures within the SC list.
2. Following Reasonable Classification: Reasonable classifications, such as sub-categorization for inter-se backwardness, are permissible under the Constitution.
3. Judging Sub-Classification on Its Own Merits: Sub-classification should be judged based on its merits, ensuring fair treatment for different caste groups.
4. Exploring Alternatives: Legal options, such as constitutional amendments, can facilitate sub-categorization, as suggested by the Attorney General of India and expert committees.
5. Data Collection and Analysis: Comprehensive data collection on the socio-economic conditions of caste communities is crucial for formulating effective policies.
6. Concept of Creamy-Layer: The concept of creamy layer, applied to SC and ST promotions since 2018, ensures reservation benefits reach those most in need.
7. Criteria Development: Transparent criteria considering socio-economic status, education, and regional disparities are essential for sub-categorization.
8. Following the Middle Path: Balancing recognition of diversity within SCs and STs with maintaining community unity is crucial for effective policies without causing fragmentation.

Committee Recommendations:

1. Justice P. Ramachandra Raju Commission (1996): Recommended sub-categorization of Scheduled Castes

- in Andhra Pradesh
2. National Commission for Scheduled Castes (NCSC): Advocated for measures to address intra-group disparities and
 3. National Commission for Scheduled Tribes (NCST): Highlighted the need to prioritize existing schemes and government benefits to reach the most backward sections of Scheduled Tribes before considering sub-categorization.
 4. Usha Mehra Committee (2008): Proposed the inclusion of Clause (3) in Article 341 through a constitutional amendment, empowering state legislatures to enact reclassification of the Scheduled Caste category, subject to Presidential confirmation.
 5. [Justice G. Rohini headed the Commission](#) for the Sub-categorisation of Other Backward Classes (OBC): Report submitted in August 2023

Conclusion:

Sub-categorizing Scheduled Castes is crucial for addressing internal disparities and ensuring targeted social justice. However, it requires careful consideration of constitutional provisions, data accuracy, and potential challenges to uplift marginalized communities effectively

Insta Links

- [Sub-categorization of Other Backward Classes](#)

Mains Links

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

Prelims Links:

Consider the following organizations/bodies in India: (UPSC 2023)

1. The National Commission for Backward Classes
2. The National Human Rights Commission
3. The National Law Commission
4. The National Consumer Disputes Redressal Commission

How many of the above constitutional bodies?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Ans: A

With reference to the 'Changpa' community of India, consider the following statements: (UPSC 2014)

1. They live mainly in the State of Uttarakhand.
2. They rear the Pashmina goats that yield a fine wool.
3. They are kept in the category of Scheduled Tribes.

Which of the statements given above is/are correct?

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

Ans: B

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

2. BHARATIYA VAYUYAN VIDHEYAK 2024

Context:

The **Bharatiya Vayuyan Vidheyak is set to replace the British Era** Aircraft Act 1934

Need to Replace the Aircraft Act 1934

1. **Frequent Amendments:** The Act has been amended multiple times to enhance safety, and oversight, and align with international conventions, creating ambiguities and confusion for stakeholders.
2. **Redundancy Removal:** Eliminate outdated provisions.
3. **Simplification:** Improve ease of doing business and streamline processes.
4. **Modernization:** Address design, manufacture, and maintenance of aircraft and related equipment.

Important Provisions:

1. **Revised Aircraft Definition:** Balloons and gliders were removed from the definition.
2. Empowerment for Rule-Making:
 - **The Central Government** is empowered to make rules to implement international civil aviation conventions.
 - Examples include the **Chicago Convention (1944) and the International Telecommunication Convention (1932)**.
3. Enhanced Powers for Aviation Authorities:
 - Increased powers for the **Directorate General of Civil Aviation (DGCA)**.
 - Enhanced authority for the **Bureau of Civil Aviation Security (BCAS)**.
 - Greater powers for the **Aircraft Accident Investigation Bureau (AAIB)**.
4. Emergency Powers:
 - **The Central Government** is empowered to issue orders in emergencies for public safety, such as detaining aircraft.
5. **License and Certification Management:** Central Government can suspend, cancel, or restrict licenses or certifications with a hearing opportunity for affected parties.
6. **Appeal Process:** Introduction of a second appeal between the initial appeal and final appeal to the Secretary, MoCA.

Significance of the Bill:

The Bill aligns with the **Atmanirbhar Bharat initiative** by regulating aircraft design and manufacturing. It expands coverage to include **drones, UAVs, flying taxis, and electronic gliders**. This move addresses the needs of a rapidly growing aviation market, with ICRA forecasting an **8-13% growth** in domestic air passenger traffic for FY2024.

Opposition: Some parliamentarians have opposed the Hindi name, arguing it violates Articles 348 1B, 120, and 340 of the Constitution, which mandate parliamentary bills to be in English. He **cited Section 3 of the Official Languages Act**, emphasizing the difficulty for South Indians to pronounce the Hindi name.

Government's Response: The bill creates a new identity for India without violating constitutional provisions. The government assured that the bill's text remains in English.

About the Chicago Convention:

Also known as the Convention on International Civil Aviation, it is an international treaty established in 1944. It set out the core principles for international air transport and created the International Civil Aviation Organization (ICAO) to oversee its implementation. The convention recognizes **nine freedoms of air**, with the **first five being officially recognized by the ICAO**. These freedoms **grant countries the right to fly over**, land in, and transport passengers and cargo between territories.

India is its member

[Topics: Bilateral, regional and global groupings and agreements involving India and/or affecting India's interests.](#)

3. A DECADE OF INDIA'S ACT EAST POLICY (AEP)

Context:

2024 is the tenth anniversary year of the Act East Policy (AEP). The AEP, which replaced the Look East Policy (LEP) in 2014, has laid the foundations for India's engagements with the East.

What is Act East Policy?

The Act East Policy (AEP) is an initiative by the Indian government, **launched in 2014**, to strengthen **economic, strategic, and cultural ties** with countries in the **Indo-Pacific region**, with a core focus on the **ASEAN nations. It**

aims to enhance **regional connectivity, promote economic cooperation, and develop strategic partnerships** to bolster India's influence and integration in the region. The policy evolved from the earlier **Look East Policy of 1992, expanding its scope and strategic objectives.**

Its key principles are-

- Develop strategic **security cooperation** and **strategic relations** in the Indo-Pacific.
- **Strengthen India's economic ties** and connectivity with the region through **increased trade and investment.**
- Boost historical **cultural ties.**
- **4C's of Act East Policy:** Culture, Commerce, Connectivity and Capacity building

India-ASEAN Strategic Partnership

- In 2012, ASEAN & India became **strategic partners.**
- ASEAN is India's **4th largest trading partner.**
- India set up a **separate Mission to ASEAN** and the **East Asia Summit** in Jakarta in April 2015 with a **dedicated Ambassador** to strengthen engagement with ASEAN and ASEAN-centric processes.

India and Other Regional Partners in the East

Apart from ASEAN, India has taken other policy initiatives and collaborations in the region that involve some members of ASEAN

- Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (**BIMSTEC**),
- Mekong-Ganga Cooperation (**MGC**)
- Asia-Europe Meeting (**ASEM**),
- East Asia Summit (**EAS**),
- ASEAN Regional Forum (**ARF**),
- ASEAN Defence Ministers' Meeting + (**ADMM+**) and
- Expanded ASEAN Maritime Forum (**EAMF**).



Initiatives under Act East Policy:

Category	Initiative	Description
Security Cooperation	Agreements with ASEAN	Combat transnational crime and terrorism
	SAGAR	Deepen economic and security cooperation with maritime neighbors, build maritime security capabilities
	India-ASEAN Agreement on Maritime Cooperation (2019)	Strengthen maritime cooperation
	Joint Exercises	Malabar naval exercise, Tiger Cub air exercise
	Delhi Dialogue	Annual discussions on politico-security and economic issues between ASEAN and India
	Defense Exports	Supplied BrahMos missile system to the Philippines.

Economic Connectivity	Connectivity Projects	India-Myanmar-Thailand Trilateral Highway, Kaladan Multi-Modal Transit Transport Project
	FTA Agreements	ASEAN-India FTA in Goods Agreement (2009), India-ASEAN Services and Investment FTA (2014)
	Business & Innovation	ASEAN-India Start-up Festival, ASEAN-India Grassroots Innovation Forum, ASEAN India Business Council (AIBC)
	Funding	ASEAN-India Cooperation Fund, ASEAN-India Science and Technology Development Fund, ASEAN-India Green Fund
	Economic Ministers' Meetings	Foster economic collaboration, ensure sustainable benefits
	IORA	Strengthen Economic Cooperation, Trade Facilitation, Investment Promotion, Social Development
Health	Supplied Covid-19 vaccines under Vaccine Maitri initiative .	
Cultural Ties	Project Mausam	Rebuild maritime cultural connections with 39 countries bordering the Indian Ocean
		Restored monuments like My Son temples (Vietnam), Buddhist Pagodas in Bagan (Myanmar), Wat Phou Temple Complex (Laos), Preah Vihear temple (Cambodia) .

Achievements:

1. **Positioned India in the Indo-Pacific:** E.g., support for the Philippines on South China Sea dispute.
2. **Strengthened strategic partnerships:** India has upgraded its relations to a **strategic partnership** with Indonesia, Vietnam, Malaysia, Japan, Republic of Korea (ROK), Australia and Singapore forging close ties with all countries in the Indo-Pacific region.
3. Enhanced links with **BIMSTEC and IOR**.
4. **Greater integration of Northeastern** states with ASEAN, e.g., India-Japan Act East Forum.

Challenges:

- Chinese economic influence in **ASEAN**.
- India's economic under-performance, e.g., **trade deficit of over \$43 billion**.

Conclusion

The Act East Policy lies at the heart of India's initiatives in the Indo-Pacific which aims to strengthen economic, security and cultural ties with ASEAN and other regional partners in the Indo-Pacific.

Prelims Link:

Q.1 The term 'Regional Comprehensive Economic Partnership' often appears in the news in the context of the affairs of a group of countries known as (UPSC 2016)

- (a) G20
- (b) ASEAN
- (c) SCO
- (d) SAARC

Ans: (b)

Q.2 In the Mekong-Ganga Cooperation, an initiative of six countries, which of the following is/are not a participant/ participants? (UPSC 2015)

1. Bangladesh
2. Cambodia
3. China
4. Myanmar
5. Thailand

Select the correct answer using the code given below:

- (a) 1 only

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

Ans: (c)

GENERAL STUDIES – 3

Topics: Major crops cropping patterns in various parts of the country, different types of irrigation and irrigation systems storage, transport and marketing of agricultural produce and issues and related constraints; e-technology in the aid of farmers.

4. UNION BUDGET PRIORITIZES AGRICULTURAL RESEARCH

Context:

The Union Budget prioritizes agricultural research to enhance productivity and climate resilience. Funding for agriculture and allied activities **rose by 8% to ₹1.52 trillion**, with the Ministry of Agriculture and Farmer Welfare receiving a **4.5%** increase from last year's estimates.

About Agricultural education and research:

They are critical **components of the development of the agriculture sector in India.**

Importance of agricultural education and research in the development of the Agriculture sector

- Improved Farming Techniques:** It helps farmers to adopt new technologies and techniques that can improve **crop yields** and **reduce costs**. This helps to increase productivity and profitability, leading to higher incomes for farmers.
- Better Seed Varieties:** These seeds can be **resistant to pests and diseases** and can withstand **adverse weather** conditions, leading to **higher crop yields**.
- Increased Food Security:** Agri education and research can help to increase food production by improving **crop yields** and introducing new crops.
- Environmental Sustainability:** Agricultural education and research can help farmers adopt practices that **conserve soil, water, and natural resources**, leading to better environmental outcomes.
- Job Creation:** The Agriculture sector is a major employer in India. Agricultural education and research can help to create new job opportunities by introducing **new technologies and techniques that require skilled labour**.

Challenges for effective implementation of agricultural education and research

1. **Under-investment in R&D:**

- The budget for **autonomous research bodies under the Ministry was cut by 2%**, indicating a gap between the goal of improving agricultural research and actual funding.
- ICRIER research shows India's agricultural research intensity (ARI) has fallen **from 0.75% in 2008-09 to 0.4%**, lower than Brazil's **1.8%** and China's **0.6%**.

2. **Impact of Climate Change:**

- Agriculture is highly affected by climate change, impacting food security. In 2023-24, overall GDP grew by **8.2%**, but agricultural GDP only grew by **1.4%**, down from **4.7%** the previous year, partly due to poor monsoon conditions from El Niño.
- Climate change is expected to cause more extreme weather, like uneven monsoons, floods, and droughts. The Economic Survey predicts wheat yields could drop by **19.3%** by 2050 and 40% by 2080, worsening food insecurity and inflation.
- Extreme weather and supply-chain disruptions** were key factors driving food inflation last year.

Other Challenges:

- Lack of Infrastructure:** The lack of basic infrastructure, such as roads, electricity, and water supply, in **rural areas**, makes it difficult for researchers to **conduct field studies and for educators** to reach out to farmers.
- Limited Access to Technology:** Farmers often lack access to new technologies due to limited **availability and affordability**.
- Knowledge and Skill Gaps:** The Agriculture sector is predominantly made up of **smallholder farmers** who often lack the knowledge and skills to adopt new farming practices and technologies.
- Limited Participation:** Women and marginalized communities often face **social and economic barriers** that limit their participation in agricultural education and research programs.

Measures taken to promote Agricultural education and research

1. Previous Budget (2023-24):

- Agriculture Accelerator Fund:** The fund will be set up to **encourage agri-startups** by young entrepreneurs in rural areas. It will also bring in modern technologies to transform agricultural practices and increase productivity and profitability.
- In 3 years, **1 crore farmers will be supported by Natural Farming**, for which

10,000 Bio Input Research Centers will be opened.

- **The Indian Millets Research Centre**, Hyderabad will be promoted as a Center of Excellence.
2. The government of India established a full-fledged **Department of Agricultural Research and Education in 1973**.
 3. **Role of ICAR:** ICAR manages various research programmes, such as horticultural research, soil fertility, agricultural mechanisation and pest management, aimed at improving the productivity and profitability of Indian agriculture.
 - ICAR established **Krishi Vigyan Kendras** for the vocational training of farmers.
 - It also assists farmers with access to improved technologies, efficient use of resources and technical support services.
 4. **National Agricultural Higher Education Project:** NAHEP launched by ICAR in 2017, with the objective of enhancing competitiveness while designing a market-oriented course curriculum, plans to develop 117 pilot courses to be offered by various agriculture universities.
 5. **Digital Agriculture Mission:** This has been initiated for 2021 -2025 by the government for projects based on **new technologies** like artificial intelligence, blockchain, remote sensing and GIS technology, use of drones and robots etc.

Conclusion

Agricultural education and research are crucial for the development of the agriculture sector. Therefore, it is vital to invest in agricultural education and research to support the long-term growth of the agriculture sector in India. The continued investment is critical to ensure sustainable agricultural growth and improved livelihoods for farmers in India.

Insta Links:

- Indian agriculture in the present times

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

5. UNION BUDGET 2024-25: TRANSIT ORIENTED DEVELOPMENT (TOD) FOR 14 LARGE CITIES

Context:

The Union Budget 2024-25 highlighted Transit Oriented Development (TOD) for 14 large cities with populations over 30 lakhs.

What is Transit Oriented Development (TOD)?

Transit Oriented Development (TOD) is an urban planning approach that focuses on creating **compact, walkable communities centered around high-quality public transport** systems. It aims to maximize accessibility to public transportation, reduce reliance on private vehicles, and promote sustainable urban growth.

Key Features:

1. **Mixed-Use Development:** Incorporates residential, commercial, and recreational spaces within walking distance of transit stations.
2. **High Density:** Encourages higher population densities near transit hubs.
3. **Walkability:** Prioritizes pedestrian-friendly infrastructure.
4. **Public Transport Integration:** Ensures efficient, reliable public transport systems are central to community design.



Examples from India:

1. **Delhi Metro:** Areas around metro stations like Connaught Place have seen significant development, with mixed-use buildings and pedestrian-friendly designs.
2. **Mumbai Metropolitan Region:** The Mumbai Metropolitan Region Development Authority (MMRDA) has proposed TOD policies to enhance development around metro and monorail stations, improving access and reducing traffic congestion.
3. **The redevelopment of New Delhi Railway Station (NDLS)** was become the first project to be undertaken on the Transit-Oriented Development (TOD) concept in the NCR.

Examples from the World:

1. **Hong Kong:** The city's MTR Corporation inte-

grates property development with its transit network, creating highly accessible, mixed-use developments around stations.

- Portland, USA: The Pearl District transformed from an industrial area into a vibrant neighborhood centered around the Portland Streetcar, featuring high-density housing, retail, and parks.
- Copenhagen, Denmark: The Finger Plan incorporates TOD principles, ensuring suburban development follows rail lines, promoting compact growth and efficient public transport use.

Pillars of TOD & Policy:

Pillars	Description
Enable Transformation (From Private to Public Transportation)	Assist cities in shifting from private vehicle dependency to public transport-oriented development.
Accessible Public Transport (Promote Green Mobility)	Promote the usage of public transport by making it accessible, encouraging walking and cycling, and curbing pollution and negative impacts of motorization.
Compact Walkable Communities	Create livable and affordable communities that are compact and walkable.

Benefits:

- Economic:** Increased property values, reduced transit times, and higher labor productivity.
- Environmental:** Lower carbon emissions, reduced air pollution, and protection of green spaces.
- Social:** Improved public health through increased physical activity, reduced urban sprawl, and enhanced quality of life.
- Reduces vehicular traffic and congestion** - This reduces private vehicular usage and congestion on roads.
- Efficient use of land resources:** Optimizes land-use efficiency compared to distributed standalone terminals. This allows for sustainable urban planning and growth.
- Leveraging complementary advantages:** Congestion pricing, parking policies along with promotion of non-motorized transit via walking and cycling can be dovetailed into the system.
- Inclusivity:** Develop inclusive habitats in transit areas so public transport users can live in walkable, livable communities. Allocate a portion of housing for Economically Weaker Sections (EWS) and affordable housing in the influence zone.
- Safety for Vulnerable Sections:** Ensure a safe society by focusing on the safety of women, children, senior citizens, and differently abled individuals through necessary amendments to building bylaws.

Challenges to Transit Oriented Development (TOD) in India:

- Land Acquisition Issues:** Difficulty in acquiring land for development due to legal and ownership disputes.
- Coordination Among Agencies:** Lack of coordination between various urban development and transportation agencies.
- Funding Constraints:** Insufficient financial resources for large-scale TOD projects.
- Regulatory Hurdles:** Complex regulatory and approval processes delaying implementation.
- Public Resistance:** Resistance from local communities due to displacement fears and lifestyle changes.
- Infrastructure Gaps:** Inadequate existing infrastructure to support high-density development.
- Environmental Concerns:** Potential negative environmental impacts and challenges in maintaining green spaces.
- Technical Expertise:** Lack of technical expertise and skilled professionals in urban planning and TOD.
- Policy Inconsistencies:** Inconsistent policies and lack of a unified approach across different regions and cities.
- Cultural Barriers:** Cultural preferences for private vehicles over public transportation.

Steps Taken for TOD in India:

- National Transit Oriented Development Policy, 2017: Guiding Principles: Includes Last Mile Connectivity, Mixed Landuse, Interconnected Street Network, etc.
 - Supportive Tools:** Emphasizes Universal Accessibility, Public-Private Partnerships (PPP), etc.
- Smart Cities Mission: Incorporates TOD as a key component to promote sustainable urban development.
- Multi-modal Integration: Efforts to integrate various transport modes (metro, bus, cycling, etc.) for seamless connectivity in TOD zones.

- Local TOD Policies; Development of specific guidelines like the TOD Manual for Delhi to guide local implementation.

Topics: Awareness in space.

6. EXPANDING THE SPACE ECONOMY

Context:

Union Budget 2024-25 proposes to set up **₹1000 crore venture capital fund for the space economy**

What are venture capital funds?

A venture capital fund is a **type of investment fund that pools money from various investors to invest in early-stage, high-potential start-ups** and small businesses. These funds aim to provide capital to companies with strong growth prospects but also higher risk.

Indian Space Economy:

- Current value:** ₹6,700 crore, 2% of the global space economy in 2021.
- Projected share:** 8% by 2030, 15% by 2047.
- Space start-ups:** Increased to nearly 200 in 2024 from 1 in 2022.
- Investment in start-ups:** \$124.7 million in 2023.
- Indian Space Policy 2023** aims to build a \$44 billion space economy.

Emerging trends and their contribution to the Indian space sector:

Trends	Contribution to the Indian Space Sector
Private participation	ISRO promotes private participation, and domestic private space companies have raised over \$245 million in funding. India ranks fifth globally in terms of the number of private space firms.
International collaboration	ISRO collaborates with countries and international organizations for joint missions and technology transfers. For example, the NASA-ISRO Synthetic Aperture Radar (NISAR) mission is a joint project.
Outer planetary missions	India made history by reaching the Martian orbit with the Mangalyaan Mission and is launching Chandrayaan-3, India's lunar exploration mission, in the first quarter of 2023.
Human missions	Gaganyaan, India's first manned mission to space, is a significant milestone scheduled for 2023.
Development of new technologies	ISRO is developing new technologies like reusable launch vehicles and Inflatable Aerodynamic Decelerator (IAD). Agnikul, a domestic startup, successfully tested 3D-printed rocket engines.
Expansion of satellite-based services	ISRO provides satellite-based services in remote sensing, navigation, and meteorology. It plans to expand these services and offer satellite-derived data to stimulate innovation.

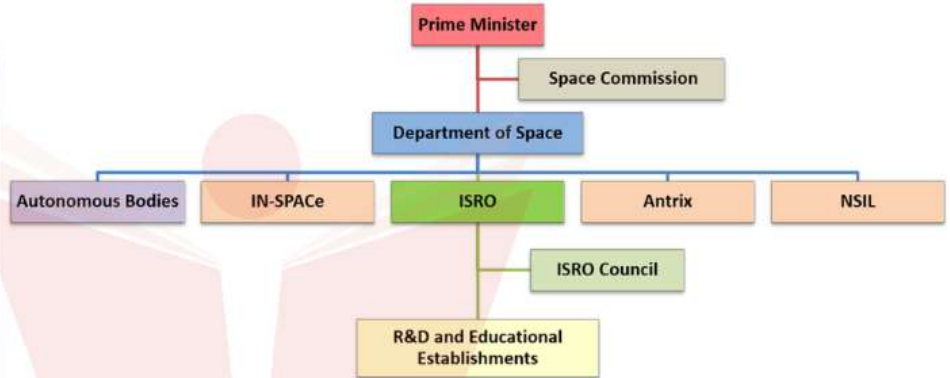


Private sector Participation in Space sector

Presently, the global space Industry is worth \$400 billion and is set to touch \$1 trillion by 2040. And, India's participation is just 2% of this mammoth share. Hence, the imperative for the private sector to play a bigger role.

Examples of Private sector participation:

- **Skyroot Aerospace:** Recently, it launched Vikram-S, India's first private rocket.
- **Airtel-backed OneWeb** is in the process of launching 648 small satellites in LEO mode to provide its high-speed satellite internet service.
- **Chennai's SRM University** has built the **SRMSat** (for monitoring carbon dioxide and water vapour)
- **Dhruva Space:** The company launched Thybolt-1 and Thybolt-2.
- **Agnikul Cosmos:** It develops rockets (using 3-D printing) fuelled by its patented semi-cryogenic engines
- **Digantara:** For addressing space junk.
- **Pixxel:** It will build a constellation of 24 hyper spectral micro satellites which will act as an "MRI scanner" of Earth.



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Skyroot Aerospace Private (HQ: Hyderabad) was founded by former engineers and scientists from ISRO

Benefits of Private sector participation in Space

- Reforms to help India leapfrog to next stages of space activities; to become a **Global technology powerhouse**
- To enhance socio-economic use of space assets & activities; **Large-scale employment opportunity in technology sector**
- **IN-SPACe*** to provide level playing field for private companies to use Indian space infrastructure
*Indian National Space Promotion and Authorization Centre
- **NSIL**** to reorient space activity models from 'supply driven' to a 'demand driven'
**New Space India Limited
- Allow ISRO to focus more on R&D activities, exploration missions & human spaceflight programme

Bottlenecks in the Indian space sector:

- **Access to Capital:** Limited funding for downstream companies, as upstream activities receive major investments.
- **Human Resource Constraints:** A need for technically inclined marketing personnel, but they tend to prefer established businesses with market-level salaries.
- **Monopolization:** High capital requirements make it challenging for many players to enter the industry, leading to potential monopolization.
- **Funding Disparity:** India's space budget is significantly smaller compared to countries like the US and China.

Measures taken to promote private sector participation in the space industry:

Measures	Description
New Space India Limited (NSIL)	Established to utilize ISRO's research and development for commercial purposes through Indian industry partners. Announced in Budget 2019.
Indian Space Association (ISpA)	Aims to represent the collective voice of the Indian space industry, including leading domestic and global corporations with advanced space and satellite capabilities.
National Space Policy 2023	The government has approved the Indian Space Policy (ISP) 2023, to boost private sector participation and increase investments in the space sector from private companies.
ISRO Startup Hub	Launched in 2019, it provides a platform for startups to collaborate with ISRO, access ISRO's facilities, and benefit from ISRO's expertise.
Space Activities Bill, 2020	Currently under consideration by the Indian Parliament, this bill would allow private companies to engage in space activities, including satellite launches and space-based services.
Other	Technology transfer to private players by ISRO, NSIL/IN-SPACe . International collaborations: NISAR program and Artemis Accords. 100% FDI in some sub-sectors

Other Recommendations:

A recent report by the Indian Space Association, NASSCOM and Deloitte India suggested adopting OECD's framework for segmenting the space value chain into upstream, downstream and Auxiliary categories.

- Upstream: All activities, products and infrastructure that ensure development, testing, launching, operations and monitoring of space assets
- Downstream: All applications, services and devices relying on satellites to create business value including Earth Observation, Satellite, SATCOM, etc.
- Auxilliary: Additional space-related activities such as space insurance, awareness, education and training

Conclusion

The Indian space sector has an opportunity to create a vibrant ecosystem for start-ups and private enterprises. India needs to focus on building a comprehensive space policy, providing access to capital for early-stage startups, access to satellite technology for industry, improved training for satellite operations, and allowing private players to use the Indian Space Research Organisation's (ISRO) testing facilities.

Insta Links

- [Milestones in India's Space Programme](#)
- [Startups are powering India's Space Odyssey 2.0](#)

Mains Link:

Q. What is India's plan to have its own space station and how will it benefit our space programme? (UPSC 2019)

Q. Discuss India's achievements in the field of Space Science and Technology. How the application of this technology has helped India in its socioeconomic development? (UPSC 2016)

Prelims Links

Q. Consider the following statements: (UPSC 2016)

The Mangalyaan launched by ISRO

1. is also called the Mars Orbiter Mission
2. made India the second country to have a spacecraft orbit the Mars after USA
3. made India the only country to be successful in making its spacecraft orbit Mars in its very first attempt

Which of the statements given above is/are correct?

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

Ans: C

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

7. WORLD MANGROVE DAY: CONSERVATION SUCCESS IN INDIA AMIDST CHALLENGES

Context:

July 26 is International Day for Conservation of Mangrove Ecosystems, declared by UNESCO **to raise awareness and promote sustainable management of mangroves**, vital for coastal protection, storm mitigation, and carbon sequestration.

About International Day for the Conservation of the Mangrove Ecosystem

Celebrated annually on July 26, this day aims to raise awareness about the importance of mangrove ecosystems and promote sustainable management and conservation solutions. It was established by **UNESCO in 2015**.

About Mangroves:

- Mangroves are salt-tolerant plant communities found in tropical and subtropical intertidal regions. They are important refuges of coastal biodiversity and act as bio-shields against extreme climatic events.
- They are located in the intermediate zone between the land and the sea and represent one of the best examples of ecotone.

The IUCN Red List of Ecosystems (RLE) **has assessed mangrove ecosystems globally for the first time, revealing alarming findings.**

- Half of the assessed global mangrove ecosystems are at risk of collapse, with nearly 20% classified as high risk.
- Major threats include climate change, deforestation, development, pollution, and dam construction.
- Climate change alone jeopardizes one-third of assessed mangrove
- Sea-level rise is predicted to submerge 25% of global mangrove area in the next 50 years.
- Without significant intervention, by 2050, climate change and sea-level rise could lead to the loss of 1.8 billion tonnes of stored carbon and expose 2.1 million lives to coastal flooding.
- Indian mangroves vary in status: Andaman and Bay of Bengal are classified as Least Concern, while South India is Critically Endangered, and West India is Vulnerable

Mangroves in India

- The 'State of World Mangroves 2022' report by the **Global Mangrove Alliance** puts the total mangrove cover of the world at 1,47,000 sq km (14.7 million hectares).
- Mangroves** make up only about 0.15% of **India's** land area but provide numerous benefits to coastal communities over its vast coastline (spanning 7516km)
- Mangroves in India are distributed across nine States and three Union Territories with West Bengal having the highest mangrove cover of 2,114 sq km.
- The IFSR report also points out that there has been an increase in the mangrove cover from 4,046 sq km in 1987 to 4,992 sq km in 2021.
- However, the **National Decadal Wetland Change Atlas (2022)** indicates a decline in natural coastal wetlands, with intertidal mudflats and salt marshes reducing significantly.

Benefits of Mangroves for India:

Benefits	Examples
Coastal Protection	Mangroves act as natural barriers against erosion, storms, and cyclones. They reduce wave impact, protecting coastal areas from damage.
Flood Mitigation	Mangroves stabilize sedimentation and help mitigate coastal flooding. In the Sundarbans region, mangroves help prevent inland flooding during monsoon seasons.
Biodiversity Habitat	Mangroves provide critical habitats for various plant and animal species, including endangered ones like the Bengal tiger and the Ganges river dolphin. E.g., Sundarbans, the world's largest mangrove forest, hosts a diverse range of species, supporting biodiversity.
Livelihood Support	Mangroves contribute to the livelihoods of fisher communities. Programs in the Sundarbans demonstrate how involving local communities can lead to sustainable livelihoods for fisherfolk.
Water Quality Improvement	Mangroves act as natural filters, trapping sediments, pollutants, and excess nutrients. They improve water quality and benefit marine ecosystems.

Climate Change Mitigation	Mangroves absorb and store carbon dioxide (CO ₂) from the atmosphere, aiding in climate change mitigation.
Resilience to Climate Change	Mangroves show adaptability to sea-level rise and increased storm intensity. They recover relatively quickly from climate-related impacts.



Initiatives for Mangroves:

Global:

- Mangrove Breakthrough:** Introduced at UNFCCC COP27 by UN High-Level Climate Champions and Global Mangrove Alliance (GMA).
- Global Mangrove Alliance (GMA)** was established at the World Ocean Summit in 2018.
- Mangrove Alliance for Climate:** Led by UAE in collaboration with Indonesia.

India:

- Mangrove Initiative for Shoreline Habitats & Tangible Incomes (MISHTI)**
- Conservation and Management of Mangroves and Coral Reefs** under the National Coastal Mission Programme
- Amrit Dharohar:** To revive and conserve wetlands, and enhance biodiversity, eco-tourism, and livelihoods of local communities.
- Maharashtra** even established a separate **Mangrove Cell** for focused conservation.

Conclusion:

Effective mangrove conservation requires a holistic approach, incorporating climate risk management, broader ecosystem health, and inclusive community involvement. The **National Coastal Mission** aims to drive these changes, ensuring mangroves and coastal ecosystems thrive amid environmental challenges.

Mains Link: UPSC 2019

Q. Discuss the causes of the depletion of mangroves and explain their importance in maintaining coastal ecology. (15M)

Prelims Link: UPSC 2011

The 2004 Tsunami made people realize that mangroves can serve as a reliable safety hedge against coastal calamities. How do mangroves function as a safety hedge?

(a) The mangrove swamps separate the human settlements from the sea by a wide zone in which people neither live nor venture out.

(b) The mangroves provide both food and medicines which people are in need of after any natural disaster.

(c) The mangrove trees are tall with dense canopies and serve as an excellent shelter during a cyclone or Tsunami.

(d) The mangrove trees do not get uprooted by storms and tides because of their extensive roots.

Solution: D

Q. Which one of the following regions of India has a combination of mangrove forest, evergreen forest and deciduous forest? (UPSC 2015)

(a) North Coastal Andhra Pradesh

(b) South-West Bengal

(c) Southern Saurashtra

(d) Andaman and Nicobar Islands

Ans: (d)

Topics: Disaster and management.

8. DROWNING: A NEGLECTED PUBLIC HEALTH CRISIS

Context:

The **increasing frequency of drowning incidents** globally (including the recent case of drowning in Rau's IAS basement library) highlights the need for comprehensive **public health interventions and policy measures** to prevent such tragedies.

What is Drowning?

It is defined as the **process of experiencing respiratory impairment from submersion or immersion in liquid**. It is a significant yet often overlooked cause of preventable deaths, particularly affecting **children and marginalized communities**.

As per the **NCRB-Accidental Deaths and Suicides, eighty persons die of drowning each day in India**, which accounts for 7.4% of all unnatural deaths.

Key Features:

- Causes: Rising sea levels, urban flooding, unsafe water transport, and risky livelihoods.
- At-risk Populations: Children, adolescents, forci-

bly displaced people, and individuals living in poverty.

3. Types of Drowning Incidents:
 - Unintentional drowning in natural water bodies.
 - Drowning during floods and natural disasters.
 - Drowning in urban settings due to poor infrastructure and safety measures.

Examples from India:

1. IAS Coaching Centre, New Delhi (2024): Flooding in the basement of a coaching centre led to the drowning of three IAS aspirants.
2. 2024 Lonavala Waterfall Tragedy
3. Chennai Floods, 2015: Flooding of basements damaged electric equipment, causing disruptions and deaths in a hospital due to the failure of emergency power generators.

Examples from the World:

1. Florida, USA (May 2024): An incident of Toddlers drowning in home swimming pools.
2. Vietnam and Uganda: Children drowning in rivers and lakes.
3. India and Bangladesh: Children drowning while travelling to school or near their homes.
4. El Salvador: Refugees and displaced people drowning during perilous journeys.

Drowning is a neglected public health crisis because:

1. **Lack of awareness:** Drowning is often under-recognized as a critical public health issue, leading to insufficient funding and attention.
 - a. E.g. Swimming is neglected at the school level.
2. **Invisibility in health policies:** It is frequently excluded from national health policies and priorities, overshadowed by more visible health crises.
 - a. E.g. No policy covers drowning as a health crisis.
3. **Fragmented data:** Inadequate data collection and reporting on drowning incidents hinder effective policy-making and resource allocation.
 - a. E.g. the Centre reported, there were 38,000 drowning deaths reported in 2023 in India.
4. **Limited resources:** Resource constraints and competing health priorities result in limited investment in drowning prevention measures and public education.
5. **Complexity of solutions:** Addressing drowning requires multi-faceted solutions involving community engagement, infrastructure improvements, and education, which can be challenging to implement effectively.
 - a. E.g. the Urban flooding of Chennai has taken many lives in the recent past.
6. Cultural and Social Barriers: Resistance to safety regulations and lack of awareness.

Impact of Drowning:

Impact	Description	Examples
Health Impact	Mental trauma for survivors and families	Families of children who drown in village ponds suffer emotional distress.
Economic Impact	Loss of livelihood due to the death of breadwinners	Fishermen drowning in coastal areas affects household economies.
Social Impact	Disruption and insecurity in communities	Fear and disruption in rural villages where children drown in open water bodies.
Educational Impact	Loss of students and impacts on school attendance	Students in remote areas risk drowning while crossing rivers to school.
Infrastructural Impact	The strain on emergency and medical services	Urban flooding in cities like Mumbai requires extensive rescue operations.
Policy and Governance Impact	Highlighting the need for better safety regulations	The Delhi coaching centre tragedy underscores the need for building safety codes.
Environmental Impact	Water contamination and environmental neglect	Drownings in polluted rivers like the Yamuna in Delhi reflect environmental hazards.
Public Health Impact	Outbreak of diseases due to drowning in contaminated waters	Chennai floods led to the spread of waterborne diseases due to contaminated waters.

Steps Taken:

1. Global Initiatives:
 - WHO's Global Report on Drowning Prevention (2014).
 - UN General Assembly resolution on drowning prevention (2021).
2. Country-specific Measures:
 - Vietnam: Swimming lessons for children under the Swim-Safe curriculum.
 - Bangladesh: Community-based childcare centres (Anchal) to supervise young children.
3. India's Strategic Framework for Drowning Prevention (2023):
 - Emphasis on robust data collection.
 - Multi-sectoral response including infrastructure improvements, transport safety, and public awareness campaigns.

Conclusion:

It is essential to incorporate water safety education and swimming skills into curricula for children and adolescents to mitigate risks. By prioritizing drowning prevention and enhancing safety measures, we can significantly reduce the incidence and impact of this often-overlooked issue.

Insta Links:

- Urban Flooding

9. FAO LAUNCHES UPDATED GUIDELINES TO TACKLE EXTREME WILDFIRES

Context:

The Food and Agriculture Organization (FAO) has updated its Integrated Fire Management (IFM) voluntary guidelines to address wildfire risks, incorporating new strategies developed by the Global Fire Management Hub (GFMH), launched by FAO and UNEP in 2023.

Explanation:

Integrated Fire Management Voluntary Guidelines: Principles and Strategic Actions is the latest publication by FAO, updating fire management guidelines that were first published two decades ago. The new edition addresses challenges posed by the current climate crisis, emphasizing proactive strategies and preparedness.

Key Principles:

- **Economic:** Maximize benefits and minimize wildfire losses through an efficient IFM program.
- **Environmental:** Integrate climate change, vegetation, and fire regimes in planning and management.
- **Equity:** Consider all stakeholder perspectives, in-

cluding gender, as wildfires impact them differently.

- **Human Health:** Implement early detection and warning systems and adapt fire danger ratings with reliable weather forecasts.

Wildfires are becoming increasingly severe due to climate change, with projections indicating a 50% rise in their frequency by the end of the century. Environmental factors such as drought, high temperatures, and strong winds are contributing to longer and more intense fire seasons. Currently, 340 to 370 million hectares of the Earth's surface are burned by wildfires each year, threatening sustainable development, and livelihoods, and generating significant greenhouse gas emissions.

Key Features:

1. **Proactive Strategies:** Emphasizing prevention and preparedness over-reactive responses.
2. **Integration of Science and Traditional Knowledge:** Encouraging the inclusion of Indigenous Peoples and local knowledge holders in fire management decisions.
3. **Gender Inclusion:** Promoting diverse fire knowledge and innovative management options.
4. **Strategic Actions:** Addressing actions before, during, and after fires to prevent wildfires and restore affected areas.

Impact of increased heatwaves and wildfires

1. **Threat to life and property:** it poses a direct threat to people's lives and property as it forces people to leave their homes.
 1. For instance, heat waves in France have brought severe droughts there resulting in the water crisis.
2. **Pollution:** Various polluting gasses are released whenever there is a wildfire, like Nitrous oxide, Co₂, PM 2.5 and **particulate matter** lesser than 2.5 microns which could severe health issues such as cardiovascular and respiratory diseases.
3. **Health-related issues:** The health impacts of Heat Waves typically involve dehydration, heat cramps, heat exhaustion and/or heat stroke.
4. **Vicious cycle:** Wildfires also burn up the carbon stored in trees and soil, releasing large amounts of smoke, methane, and carbon dioxide into the atmosphere, which increase overall temperatures.
5. **Threat to biodiversity:** increased heat waves and Wildfires destroy the habitats and the intricate relationships of diverse flora and fauna leading to loss of ecosystems and biodiversity.
 1. For instance, Florida's sea turtles are

grappling with a gender imbalance made worse by climate change which has resulted in sand beaches getting hotter leading to every turtle being born as female.

Various steps taken by countries to mitigate its impact:

Country	Steps Taken
USA	The US Senate passed a \$430 billion bill to fight climate change and raise corporate taxes.
Japan	Initiated research for a green GDP measurement reflecting progress in reducing greenhouse gas emissions.
Germany	The European Commission approved a €3 billion scheme to support renewable energy and waste heat-based district heating programmes.
India	Approved new targets for slashing emissions and aims to meet half of its energy demands from renewable sources by 2030.

Other Steps Taken:

- **Global Fire Management Hub:** Launched in 2023 by FAO and UNEP, supported by countries like Canada, France, Germany, Portugal, South Korea, and the USA, it aims to unite the global fire management community.
- **Funding:** Nearly \$5 million has been secured to enhance national capacities for integrated fire management strategies.

Measures needed

- **Awareness:** Improving community information and preparedness reduces vulnerability.
- **Improved development planning,** building standards and management of the forest-urban boundary reduces exposure.
- **Early warning:** Information about forest dryness is useful for early warning and preparedness for extreme fires. Similarly, mapping climate variability across many years can help predict extreme years.
- **National and local measures:** Pursuing ambitious global greenhouse gas mitigation alongside national and local measures to adapt to a climate-changed world, is a necessary strategy if we are to limit further increases in fire risk
- **GHG mitigation:** While efforts can be made to limit vulnerability, exposure and fire itself, it is clear that the contribution of climate change to fire risk would be lower if greenhouse gas emissions were curtailed.

Conclusion

Climate change is happening. This should be accepted and not politicised. International cooperation to address climate change is vital to mitigate the adverse impact. Additionally, mitigation must be complemented with climate change-related adaption since mitigation alone cannot address the adverse effects we are facing right now.

Insta Links

1. Forest Fires

Practice Questions

Q. Enumerate the causes for the rising instances of forest fires in India. What measures are needed to mitigate the adverse impacts of forest fires? (250 Words).

10. DISASTER MANAGEMENT (AMENDMENT) BILL 2024

Context:

The Minister of State for Home Affairs introduced the Disaster Management (Amendment) Bill, 2024 in the Lok Sabha, to amend the Disaster Management Act, 2005

Aim of the Bill: The Bill aims to introduce changes for effective pre-planning of disaster events, integration of disaster preparedness in developmental plans, and give clarity of roles and responsibilities to the authorities handling disasters (aligning with **recommendations of the** 15th Finance Commission)

Key Features of the Disaster Management (Amendment) Bill, 2024:

Feature	Description
Creation of Disaster Database	Establishes a disaster database at national and state levels , including disaster assessments, fund allocation, expenditure, preparedness and mitigation plans, and risk registers.
Prepare Disaster Plan	Empowers NDMA and SDMA to prepare disaster plans , replacing the National Executive Committee and State Executive Committees . Plans must be reviewed every three years and updated every five years.
Creation of Urban Disaster Management Authority	Proposes the creation of Urban Disaster Management Authorities for state capitals and large cities with municipal corporations (excluding Delhi and Chandigarh).
Statutory Recognition	Grants statutory status to the National Crisis Management Committee and the High-Level Committee.
State Disaster Response Force	Allows state governments to form State Disaster Response Forces to enhance state-level disaster response.
New Section 60A	Empowers Central and State governments to direct individuals on disaster management actions and impose penalties up to ₹10,000 for non-compliance.

How Measures in the Disaster Management (Amendment) Bill, 2024 Will Help in Disaster Management?

- **Enhanced Disaster Database:** Provides detailed data on disaster assessments and risk, such as tracking the impact of floods in Bihar or cyclones in Odisha, aiding better planning and response.
- **Urban Disaster Authorities:** Creates dedicated authorities in cities like Mumbai and Delhi, improving response to urban crises such as building collapses or air pollution emergencies.
- **Revised Disaster Planning:** NDMA and SDMAs can develop more integrated plans, as seen in coordinated responses to the 2023 Gujarat earthquake, enhancing efficiency and coverage.
- **Statutory Recognition:** Strengthens bodies like the National Crisis Management Committee, leading to improved coordination in large-scale disasters such as the 2019 Kerala floods.
- **State Disaster Response Force:** Empowers states to form specialized forces, like the proposed response team in West Bengal for riverbank erosion, improving local readiness and response.
- **Penalties for Non-Compliance:** Ensures adherence to disaster management protocols, for instance, enforcing building safety standards to prevent disasters similar to the 2013 Uttarakhand floods.

Disaster Management Act, 2005: Key Features

Feature	Description
3-Tier Institutional Structure	National Level: NDMA, led by the Prime Minister. State Level: SDMAs, headed by Chief Ministers. District Level: DDMA, led by District Collectors, Magistrates, or Deputy Commissioners.
National Disaster Response Force	Established for specialist response to disaster situations .
National Disaster Response Fund	Created to fund and manage response efforts during threatening disaster situations.

Insta Links:

National Disaster Management Act, 2005

GENERAL STUDIES – 4

1. THE ETHICS OF HUNGER STRIKES AS A MODE OF PROTEST

Context:

Hunger strikes as a form of protest have been a contentious method, raising numerous ethical questions about the treatment of strikers and the state's response.

Explanation:

Definition: Hunger strikes are **deliberate refusals to eat, often employed** to achieve political or social goals.

Historically, hunger strikes have been used in various cultures, such as **pre-Christian Ireland's troscad** and in ancient Indian texts like **Kalhana's Rajatarangini**. The practice became prominent in the late 19th century, with significant examples from Russian political prisoners, the suffragette movement, and **Gandhiji's hunger strike against injustices**.

Key Features:

1. **Physiological Defiance:** Hunger strikes use the body's natural processes as a direct challenge to authority.
2. **Alternative Protest Method:** In situations where other forms of protest are unavailable, hunger strikes become a potent tool.
3. **Emotional Appeal:** The self-imposed suffering of hunger strikers is designed to evoke a response from the public and authorities.

Examples:

- **Global:** Irish republican Thomas Ashe, suffragette Marion Wallace Dunlop, and Japanese anarchist Akaba Hajime.
- **India:** Freedom fighters like Mahatma Gandhi, Jatin Das (Died after a 63-day hunger strike), Bhagat Singh, and modern activists like Irom Sharmila (Manipur), Potti Sriramulu (hunger strike led to the formation of the state of Andhra Pradesh) and Anna Hazare (hunger strike against corruption in 2011)

Recent Examples:

- **Manoj Jarange-Patil:** Fasts demanding Maratha community reservations.
- **Sonam Wangchuk:** 21-day hunger strike for Ladakh's constitutional safeguards.
- **Khader Adnan:** Palestinian prisoner who died after an 87-day hunger strike in 2023.

Ethical Considerations:

1. **State Response:** The use of force-feeding by authorities, which can lead to severe health complications or death, raises significant ethical issues.
2. **Health and Safety:** Providing medical care against the striker's will or allowing a striker to die poses moral dilemmas for both medical professionals and the state.
3. **Autonomy vs. State Control:** Balancing the striker's autonomy with the state's responsibility to preserve life.

Benefits:

1. **Highlighting Injustices:** Hunger strikes can draw significant attention to causes and injustices.
2. **Non-violent Resistance:** It is seen as a powerful form of non-violent protest.
3. **Historical Significance:** They have a proven track record in various movements and resonate culturally as a form of sacrifice and protest.
4. **Moral High Ground:** By enduring personal suffering, hunger strikers highlight the injustice they protest against.

Challenges:

- **Moral Dilemmas:** Ethical questions about the appropriateness of force-feeding and providing medical care against the will of the striker.
- **Health Risks:** Prolonged starvation leads to severe health risks, including death.
- **Preservation of Life:** Ethical principles emphasize the importance of preserving life, which can be compromised by hunger strikes.
- **State's Role:** The state's approach to handling hunger strikes can lead to human rights abuses.
- **Coercion:** Hunger strikes can pressure authorities and manipulate public sentiment, raising concerns about fairness and legitimacy.
- **Impact on Others:** The emotional burden on family and friends and the potential need for others to intervene.

raise ethical issues.

- **Legal and Medical Ethics:** Authorities and healthcare professionals face dilemmas balancing respect for autonomy with the duty to preserve life, such as issues around forced feeding versus neglect.

Steps Taken:

- **Legal and Medical Guidelines:** Various guidelines exist, such as the World Medical Association's 1975 **Tokyo Declaration**, which condemns force-feeding.
- **Geneva Convention:** Sets standards for wounded combatants, but its application to hunger strikers is unclear, complicating health professionals' roles.
- **Indian Context:** Madras High Court ruled that hunger strikes are not an offence under Section 309 (attempt to suicide).

Views of various Ethical Thinkers:

Thinker	Views on Hunger Strikes
John Stuart Mill	Advocated for individual freedom and the right to protest , including through hunger strikes, as long as it doesn't harm others.
Gandhi	Preferred " fasting " over " hunger strikes " and viewed it as a means of self-reform rather than a tool for political demands. He believed fasting should be used to appeal to personal or moral reform rather than to coerce political change.
Swami Vivekananda	Emphasized practical spirituality and the need for effective means of social reform . He might see hunger strikes as a legitimate form of protest if it aligns with moral and spiritual principles but would also consider its broader social impact.
Dr. B.R. Ambedkar	Criticized hunger strikes as "unconstitutional" and favoured legal methods for social and economic goals.

Insta Links:

- Ahmadabad Mill Strike, 1918

CONTENT FOR MAINS ENRICHMENT

Topic in News	Usage in Answers
<p>1. OLYMPICS 2024: GREENEST GAMES EVER</p>	<p>Context: Paris 2024 aims to be the greenest Olympics, cutting emissions to 1.75 million tonnes, down from the usual 3.5 million tonnes.</p> <p>This eco-friendly approach includes using existing buildings for 95% of events, generating power from geothermal and solar sources, and promoting sustainable food and transportation. Despite challenges like managing carbon emissions from air travel and dealing with high temperatures, the Games showcase a commitment to sustainability. The event highlights the urgent need for climate action as the world faces record-breaking temperatures and environmental crises.</p>

2. NCERT: 10 BAGLESS DAY FOR STUDENTS

Context: The NCERT has proposed 10 'bagless days' for students of Classes 6 to 8 to provide them with exposure to the world outside the classroom.

Teachers are encouraged to plan activities with local vocational experts such as carpenters, gardeners, potters, and artists. These guidelines align with the National Education Policy 2020 and emphasize work-centered pedagogy to prepare students for the 'World of Work'. The curriculum is divided into three themes: 'Science, Environment and Tech', 'Public Office, Local Industry and Business', and 'Art, Culture and History'.

Benefits:

1. **Experiential Learning:** Encourages hands-on, practical education.
2. **Community Engagement:** Involves learning from local vocational experts.
3. **Respect for Labor:** Promotes the dignity of various vocations.
4. **Holistic Education:** Balances theoretical knowledge with practical application.
5. **Cultural Awareness:** Includes exposure to art, culture, and history.
6. **Environmental Responsibility:** Focuses on understanding science, environment, and technology.
7. **Social Responsibility:** Involves visits to public offices and local industries.

3. IAS OFFICER MANISH BAN-SAL

Context: The Sot River, a crucial water source in Sambhal, Uttar Pradesh, dried up due to decades of neglect and encroachment. In 2022, IAS officer Manish Bansal took charge and initiated a comprehensive river rejuvenation project. The district administration conducted surveys, cleared illegal encroachments, and desilted the riverbed with the help of MGNREGA workers.

Within six months, the 110 km river was revived, restoring its natural flow and eliminating waterlogging. The project included planting 10,000 bamboo saplings to prevent soil erosion and constructing micro-check dams to regulate water flow.

The project to revive the Sot River exemplifies several ethical values:

1. **Community Collaboration:** Effective teamwork between officials and locals.
2. **Environmental Stewardship:** Commitment to restoring and preserving natural resources.
3. **Integrity:** Addressing and removing illegal encroachments.
4. **Perseverance:** Completing a significant environmental project in a short time-frame.
5. **Public Service:** Prioritizing the well-being of the community and future generations.
6. **Innovation:** Implementing creative solutions like desilting and micro check dams.
7. **Responsibility:** Ensuring sustainable practices for long-term benefits.

4. DARK TOURISM

Context: The Kerala Police have urged people not to visit landslide-hit Wayanad for sight-seeing, warning against **“dark tourism” amid ongoing rescue efforts.**

What is Dark tourism?

It is also known as grief tourism, which involves visiting places associated with death, tragedy, or suffering. Examples include:

1. **Auschwitz:** A Nazi concentration camp in Poland where millions perished during the Holocaust.
2. **Chornobyl:** The site of the 1986 nuclear disaster in Ukraine.
3. **Hiroshima:** The Japanese city was devastated by an atomic bomb in 1945.
4. **9/11 Memorial:** A tribute to the victims of the September 11 attacks in New York City.

These sites attract visitors **seeking to understand and reflect on historical tragedies.**

Dark tourism raises several ethical issues:

1. **Exploitation:** Turning sites of tragedy into commercial attractions can be seen as profiting from suffering.
2. **Respect:** Visitors may show disrespect, such as taking inappropriate selfies at solemn sites.
3. **Impact on Communities:** Increased tourism can disrupt local communities and their mourning processes.
4. **Voyeurism:** There is a risk of sensationalizing and trivializing the experiences of victims.
5. **Consent and Sensitivity:** It is crucial to handle these sites with sensitivity and obtain consent from affected communities for tourism activities.

FACTS FOR PRELIMS

GS-1

Art & Culture

1. MONASTERY OF SAINT HILARION/ TELL UMM AMER

Context:

The Monastery of Saint Hilarion/Tell Umm Amer in Palestine has been inscribed on the World Heritage List and the List of World Heritage in Danger by UNESCO.

The monastery, founded by Saint Hilarion, is one of the **oldest in the Middle East** and was a hub for religious, cultural, and economic exchanges during the **Byzantine period**. UNESCO's **decision follows a December 2023 move** to grant the site provisional enhanced protection under the **1954 Hague Convention**.



UNESCO, **headquartered in Paris**, leads global cooperation in education, science, culture, and communication, overseeing over 2000 World Heritage sites and various other cultural and educational networks.

GS-2

Functioning of Parliament and State Legislatures

2. EXTERNAL COOPERATION

Context:

The Indian central government criticized **Kerala for appointing a secretary for "external cooperation"**, stating that **foreign affairs fall solely under the central government's jurisdiction according to the Constitution**.

Constitutional provisions regarding External Affairs Seventh Schedule:

- All matters which bring the Union into relation with any foreign country" is listed **under Union List**.
- **Article 253:** Parliament has power to make **any law for implementing any treaty with any other country or any decision** made at any international conference, etc.
- **Article 293:** **Places territorial limits on borrowing power of the states**, i.e., states non-access to foreign loans.

Governance

3. SAFAL TEST CYCLE 2024 TO REDUCE EXAM STRESS

Context:

CBSE Launches SAFAL Test Cycle to Ease Exam Pressure

Key Points	Details
Objective	Assess students of Classes 5 and 8 on core concepts instead of rote learning with no preparation required.
Background	SAFAL (Structured Assessment For Analyzing Learning) aligns with NEP 2020 to reduce exam fear. It started with 80 schools in 2022, expanded to 1,887 schools in 2023. In 2024, over 10 lakh students from 11,000 schools are participating.
Implementation	SAFAL will test science, math, and languages in 75-minute (Class 5) and 90-minute (Class 8) sessions .
Assessment Levels	1. Below Basic (two grades lower skills) 2. Basic (one grade lower skills) 3. Proficient (current grade skills) 4. Advanced (above grade skills)
Scoring	Scores are scaled for difficulty, not percentages, to act as a diagnostic tool rather than ranking students.
Future Plans	Expand to all 29,000 CBSE schools by 2025.
Goal	Identify learning gaps and plan targeted interventions without adding pressure on students.

About PARAKH (Performance Assessment, Review, and Analysis of Knowledge for Holistic Development): Independent unit within NCERT, established in 2023.

Focus Areas:

- Capacity Development under **Project VidyaSagar**.
- National Achievement Survey (NAS) for ongoing as-

essment.

- **Equivalence of School Boards** for uniform credit systems.
- **Holistic Progress Cards** for various educational stages.

4. NATS 2.0 PORTAL

Context:

The Union Education Minister launched the **National Apprenticeship Training Scheme (NATS) 2.0 Portal**.

- The portal aims to **enhance the skilling and employability of youth in various sectors like IT, manufacturing, and automobiles.**
- It will help **apprentices register and apply for opportunities, while establishments can manage vacancies and contracts.**

About NATS 2.0 Portal:

- The **NATS 2.0 portal, developed by the Ministry of Education with AICTE support, manages the entire apprenticeship lifecycle.**
- This initiative supports the **National Education Policy (NEP) 2020's goals of integrating vocational and general education.**

International relations

5. CULTURAL PROPERTY AGREEMENT

Context:

India and the US signed **their first Cultural Property Agreement (CPA)** to **prevent and curb the illicit trafficking of Indian antiquities to the US.**

- The **agreement aligns with the 1970 UNESCO Convention, which aims to prohibit and prevent the illicit import, export, and transfer of cultural property.**
- Since 1976, **India has repatriated 358 antiquities, with 345 retrieved since 2014, mostly from the US.**
- In 2023, **the US offered 1,440 artefacts for repatriation, with around 300 deemed eligible under the "antique" category.**
- The **agreement aims to make the repatriation process faster and smoother.**

With this agreement, **India joins 29 other nations with US bilateral cultural property agreements, strengthening cooperation between the two countries in protecting cultural heritage.**

6. INDO-PACIFIC ECONOMIC FRAMEWORK (IPEF)

Context: India has been elected as the Vice-Chair of the Supply Chain Council under the Indo-Pacific Economic Framework (IPEF).

- The council was established as part of the **IPEF Supply Chain Resilience Agreement, which aims to mitigate risks of economic disruptions due to supply chain shocks, enhance crisis coordination, and reduce dependence on China.**
- The **council's mission is to undertake targeted, action-oriented initiatives to bolster supply chains for sectors and goods vital to national security, public health, and economic well-being.**



GS-3

Indian Economy

1. LIQUIDITY COVERAGE RATIO (LCR)

Context:

The Reserve Bank of India's (RBI) latest draft guidelines **require banks to hold more liquid assets to handle potential bank runs**, potentially slowing credit growth. Banks must now account for **outflows from digital deposits** when calculating the **Liquidity Coverage Ratio (LCR)**.

What is the Liquidity Coverage Ratio (LCR)?

The Liquidity Coverage Ratio (LCR) is a **regulatory standard requiring banks to hold a sufficient amount of high-quality liquid assets (HQLA)** that can be quickly converted to cash to meet their short-term obligations over a 30-day stress scenario. The goal is to ensure banks can survive a period of significant financial stress without needing external assistance. LCR in banking resulted from the **Basel III agreement.**

$$\text{Liquidity Coverage Ratio (LCR)} = \frac{\text{High-Quality Liquid Asset Amount (HQLA)}}{\text{Total Net Cash Flow Amount}}$$

Liquidity Coverage Ratio (LCR)

This move **aims to ensure banks can meet sudden digital withdrawal demands**, similar to the collapse of **Silicon Valley Bank**. However, this conservative approach may force banks to invest more in government securities, reduce credit growth, and maintain higher deposit rates.

2. PROMPT CORRECTIVE ACTION FRAMEWORK

Context:

The **Reserve Bank of India (RBI)** has introduced a Prompt Corrective Action (**PCA**) framework for Urban Cooperative Banks (**UCBs**).

- This framework **aims to enable timely supervisory intervention and ensure UCBs implement necessary remedial measures** to restore their financial health.
- **It replaces the existing Supervisory Action Framework (SAF) last revised in January 2020.**
- The **new PCA framework is designed to provide flexibility** by allowing **entity-specific supervisory action plans based on individual risk assessments.**
- It aligns with **similar frameworks for Scheduled Commercial Banks and Non-Banking Financial Companies** while maintaining supervisory rigor.
- The revised framework focuses on **capital, asset quality, and profitability, particularly targeting larger UCBs for intensive monitoring.**
- It **will not apply to small Tier 1 UCBs.** The RBI has categorized UCBs into four tiers for regulatory purposes.

3. FULLY ACCESSIBLE ROUTE (FAR)

Context:

The **Reserve Bank of India's (RBI)** recent decision to **exclude new 14-year and 30-year government securities (G-Secs) from the Fully Accessible Route (FAR)** may unsettle bond markets, potentially causing yield spikes for these securities.

- Experts warn that this **exclusion could erode investor confidence, reduce participation, and increase yields due to diminished foreign portfolio investor (FPI) demand.**
- FPIs generally prefer **stable regulatory environments, and changes can lead to uncertainty and adjustments in investment strategies.**
- Despite this, **large domestic investors are expected to absorb the fresh supply of these tenors.**
- RBI's move **aims to mitigate the potentially destabilizing effects of large capital flows in fixed-income markets by limiting investments in the more liquid segments.**

The Fully Accessible Route (FAR) regulations impose **no**

limits on investments by Non-Resident Indian retail investors. NRIs can invest in Government Securities both on repatriable and non-repatriable bases, depending on the terms and conditions of the investment scheme.

4. OPEN MARKET SALE SCHEME

Context:

The government recently announced that **grain-deficient states can directly purchase rice from the Food Corporation of India (FCI)** under the **Open Market Sale Scheme (Domestic) (OMSS [D])** for ₹2,800 per quintal **without participating in e-auctions, effective August 1.**

- This move aims to **reduce surplus stocks before the new procurement season.**
- The government has **achieved 100% coverage of fortified rice distribution to combat anaemia and nutrition deficiency.**

About the Open Market Sale Scheme:

The **Food Corporation of India (FCI)** sells **surplus stocks of wheat and rice through e-auctions in the open market to enhance food grain supply and regulate wheat prices.**

These auctions are part of the **Open Market Sale Scheme (OMSS)**, conducted weekly on the **National Commodity and Derivatives Exchange Limited (NCDEX) platform**, which facilitates trading in **various agricultural and other commodities in India.**

Agriculture

5. SAFFRON

Context:

Kashmir's saffron crop, a highly prized spice, **is severely affected by prolonged dry spells and climate change.**

The saffron spice, known as **kong in Kashmiri, zaffran in Urdu, and kesar in Hindi**, is extracted from the **stigma of the saffron flower (Crocus sativus L).**

Highly valued, Kashmiri kesar sells for around Rs 3 lakhs per kilogram. Obtaining just **one gram of kesar requires about 160-180 flowers, making its production labour-intensive.**



Science & Technology

6. GROWTH-INDIA TELESCOPE

Context:

India's **first fully robotic telescope, the GROWTH-India telescope** at the Indian Astronomical Observatory in Ladakh, captured a building-sized asteroid as it approached Earth.

The telescope, **part of a joint venture by IIT Bombay and the Indian Institute of Astrophysics**, tracked the asteroid's rapid movement, causing background stars to appear as streaks. This **0.7m** wide-field telescope specializes in time-domain astronomy and is part of the **Global Relay of Observatories Watching Transients Happen (GROWTH) initiative**. The project is funded by India's DST-SERB and the NSF.

7. OROPOUCHE FEVER

Context:

Brazil has reported its **first-ever deaths from Oropouche fever**, a **mosquito-borne disease with symptoms similar to dengue, but severe cases are rare**.

- The virus, **first detected in Trinidad and Tobago in 1955**, has **spread to Latin America, the Caribbean, and recently to Europe, with Italy reporting its first case in June 2024**.
- **Oropouche fever is transmitted by infected midges and mosquitoes**, and symptoms start between **four and eight days after the bite**, including **fever, headaches, pain, and sometimes**

nausea.

- **Most patients recover in about seven days, and there is no vaccine or specific treatment.**

The disease's spread may be **influenced by climate and environmental factors such as deforestation, but much about its transmission remains understudied.**

8. CALLER ID SPOOFING

Context:

Caller ID spoofing allows a phone call to appear as if it originates from a falsified number, often used by **fraudsters, telemarketers, and others to hide their identity**.

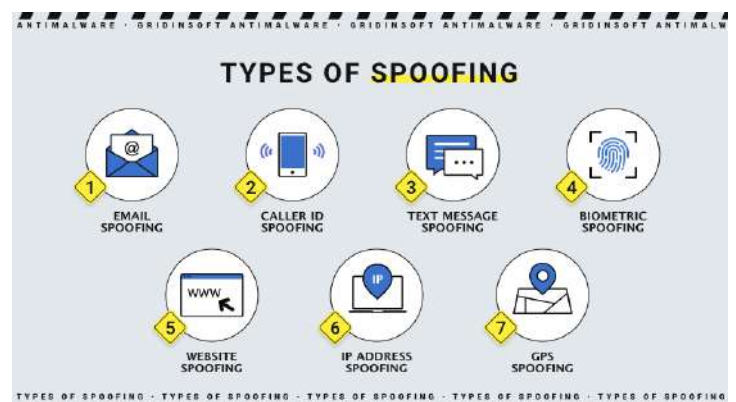
- It's legal in many places, **leading to the rise of commercial spoofing services since 2004.**

About Spoofing:

- **Spoofing is used for social engineering attacks, bypassing call blocking, and exploiting IVR system vulnerabilities.**
- **The Telecom Regulatory Authority of India (TRAI) suggested a Calling Name Presentation (CNP) system to display caller names based on KYC documents.**
- The Department of Telecommunications (DoT) has **directed telecom operators to block international calls with manipulated Caller Line Identity (CLI)**, though the system's effectiveness remains unclear.

The Telecommunications Act, 2023 empowers the government to **control telecom services during emergencies, but there has been criticism of government inaction on spoofing.**

Addressing this **issue would reduce fraud and spam calls, saving revenue for telecom providers and benefiting consumers** and the economy.



9. ONE DAE ONE SUBSCRIPTION

Context: The **Department of Atomic Energy (DAE)** launched the **'One DAE One Subscription' (ODOS)**.

- This **initiative unites DAE and its 60 subunits under a single umbrella**, providing **access to national and international research papers and scientific journals**.
- The ODOS will allow **DAE scientists, engineers, students, and researchers to access a broader range of knowledge and publish in open-access journals**.
- This initiative aims to make knowledge more accessible and will eventually **merge with the larger 'One Nation One Subscription' (ONOS) initiative**.

The agreements **include perpetual rights to journals and cover Article Processing Charges (APC)** for publishing in open-access journals.

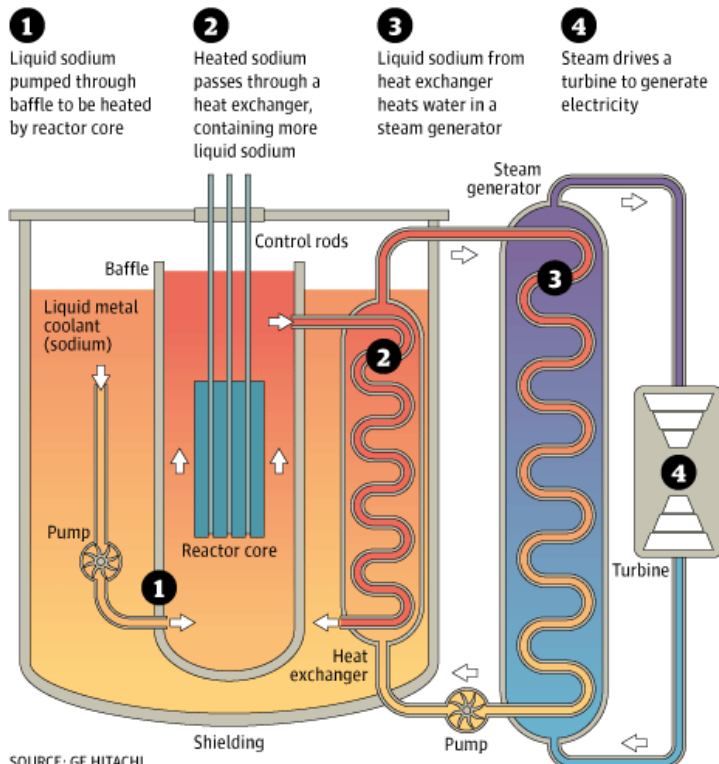
10. KALPAKKAM FAST BREEDER REACTOR

Context:

The **Atomic Energy Regulatory Board (AERB)** has approved the **'First Approach to Criticality'** for India's **first 500 MWe Prototype Fast Breeder Reactor (PFBR)** at Kalpakkam, Tamil Nadu.

- This approval involves loading fuel into the reactor core and initiating **'Low Power Physics Experiments'**.

Inside a fast reactor



SOURCE: GE HITACHI

11. NANO-MIND TECHNOLOGY

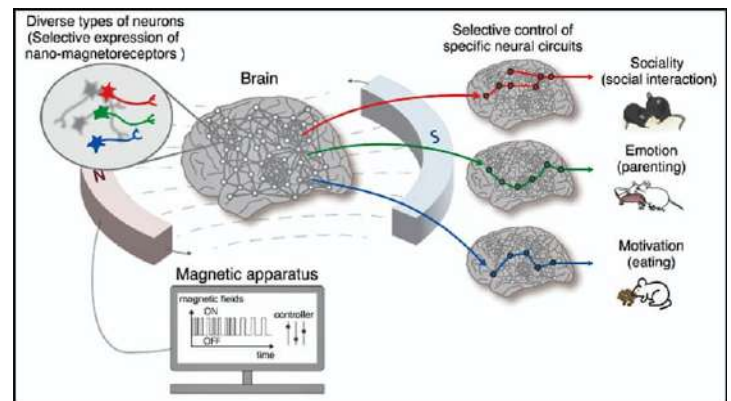
Context:

In a ground-breaking experiment, **researchers at the Center for Nanomedicine at the Institute for Basic Science (IBS) and Yonsei University in South Korea** have **demonstrated the ability to control specific brain regions in mice using magnetic fields**.

- This innovation, **called Nano-MIND (Magneto-genetic Interface for NeuroDynamics) technology**, uses **magnetic fields and magnetized nanoparticles** to wirelessly and precisely modulate specific deep brain neural circuits.
- The technology **enables the selective activation of targeted brain circuits, surpassing current brain manipulation methods**.
- The potential applications of Nano-MIND in understanding **brain functions, developing sophisticated artificial neural networks, advancing brain-computer interface (BCI) technologies, and creating new treatments for neurological disorders**.
- This advancement in neuroscience **could revolutionize research and treatment methodologies for brain-related conditions** by providing a **more precise and less invasive approach**.

How it works?

In their experiments, the researchers successfully activated neurons in various brain regions, such as **the medial preoptic area (MPOA) to stimulate maternal behaviours in non-maternal female mice, and the lateral hypothalamus to regulate feeding behaviours**, significantly altering appetite and feeding patterns.



12. MRNA VACCINE DEVELOPMENT AGAINST HUMAN AVIAN INFLUENZA (H5N1)

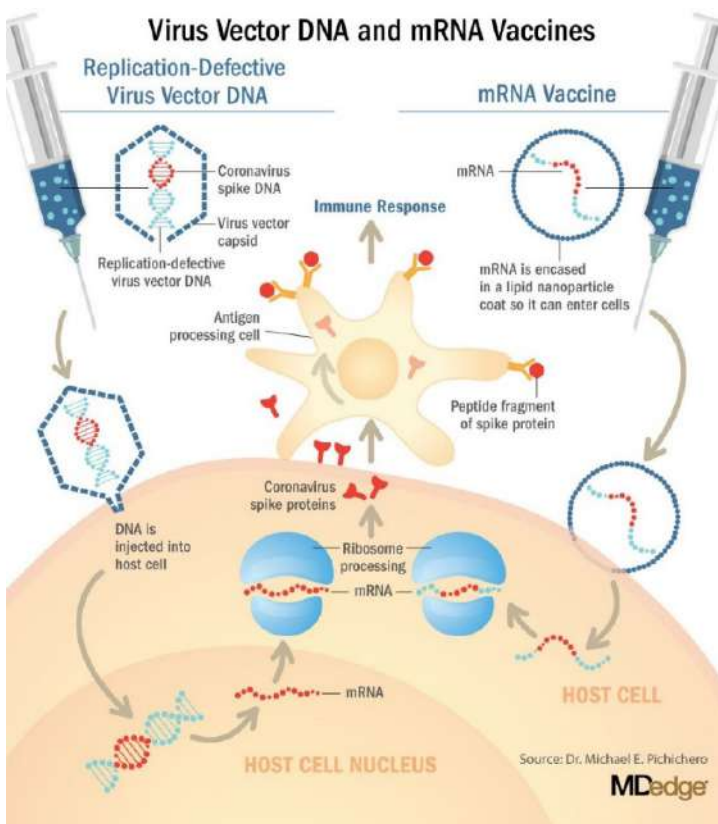
Context:

A **new initiative to develop and distribute mRNA vaccines for human avian influenza (H5N1) in low- and middle-income countries (LMICs)**, in collaboration with the **World Health Organization (WHO)** and the

Medicines Patent Pool (MPP).

- The project is **part of the mRNA Technology Transfer Programme, established in 2021 to enhance vaccine production capacity in LMICs.**
- Once successful, the knowledge and materials will be **shared with other manufacturers to expedite vaccine development and strengthen pandemic preparedness.**
- The initiative **aligns with ongoing efforts to improve the sharing of influenza viruses and vaccine access** under the Pandemic Influenza Preparedness Framework.

The mRNA Technology Transfer Programme has already developed a platform for COVID-19 vaccine candidates, which is now being adapted for other diseases, enhancing global vaccine equity.



13. GENETIC SCREENING

Context:

Athletes worldwide are **increasingly turning to genetic screening to enhance their performance.**

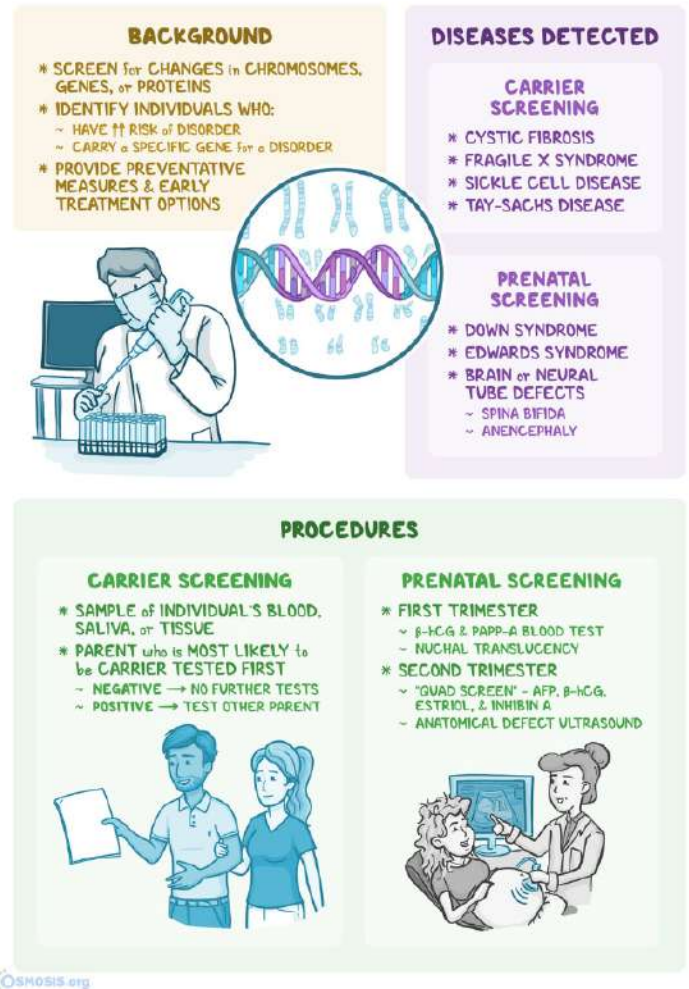
- This emerging science **offers valuable insights into personal traits like food allergies, vitamin and mineral needs, and other physiological factors.**
- The Board of Control for Cricket in India has been using genetic tests since 2017 to improve players' physical capabilities, including speed, endurance, recovery time, and muscle-building.

Genetic screening is a tool used to **identify individuals at higher risk for developing certain disorders or carry-**

ing specific genes for these disorders.

It involves **testing genetic material**—chromosomes, genes, or proteins—to detect changes that might increase disease risk.

By identifying altered genes, genetic screening helps determine risk and offers preventive measures and early treatment options.



14. KINDLINS

Context:

A study explored the role of **Kindlins—adapter proteins involved in cell signalling—in various cancers.**

- These proteins are **critical for transferring extracellular cues to biochemical signals within cells, influencing multiple signalling pathways essential for cellular homeostasis.**
- Mutations in Kindlins, **caused by carcinogens like nicotine and UV rays, can disrupt this balance and contribute to cancer progression.**

How the study was conducted?

- The researchers analysed data from 10,000 patients with 33 cancer types, **revealing that Kindlin 1 regulates the immune microenvi-**

ronment in breast cancer, while Kindlin 2 governs cancer-specific metabolic processes and HIPPO signalling, which promotes cell migration and invasion.

- The study emphasized the **importance of Kindlins in tumour progression, metastasis, and epithelial-mesenchymal transition (EMT).**
- Their findings suggest that **Kindlins are involved in essential mechano-sensitive pathways and their dysfunction is linked to adverse survival outcomes.**
- The research provides evidence for **Kindlins as potential targets for innovative cancer treatments, offering new strategies to address chemoresistance and tumour relapse.**

15. WHO GLOBAL TRADITIONAL MEDICINE CENTRE (GTMC)

Context:

India will donate USD 85 million over ten years (2022-2032) to support the WHO Global Traditional Medicine Centre (GTMC) in Jamnagar, Gujarat.

- The centre aims to **serve as a key hub for evidence-based Traditional Complementary and Integrative Medicine (TCIM) to improve global health and well-being.**
- The interim office is **already operational, focusing on capacity-building and training.**
- This collaboration aligns with **India's efforts to position traditional medicine globally,** contributing to sustainable development goals through various joint initiatives with WHO.

[Environment & Ecology](#)

16. AGARWOOD

Context:

India has successfully **prevented the inclusion of Aquilaria malaccensis (agarwood) in the Review of Significant Trade (RST) under CITES,** allowing for a new export quota.

- This development **will benefit farmers, particularly in Assam, Manipur, Nagaland, and Tripura.**
- **Informal trade had increased due to past restrictions,** but the **new quota aims to regulate and legalize the trade.**

About Agarwood:

- Agarwood, used in the **aroma industry, medicine, and air fresheners, has a significant economic impact.**
- The **essential oil from agarwood has multiple traditional and medicinal uses,** making it a valuable commodity.

17. IDEAS4LIFE PORTAL

Context: Union Minister **for Environment, Forest and Climate Change,** launched the **Ideas4LiFE portal at IIT Delhi.**

- The portal **invites innovative ideas to promote environment-friendly behaviours and lifestyles,** encouraging **students, researchers, faculty, and innovators to contribute.**
- The Ideas4LiFE initiative supports Mission LiFE's seven themes: **saving water, saving energy, reducing waste and e-waste, rejecting single-use plastics, adopting sustainable food systems, and healthy lifestyles.**
- The initiative is supported by **educational institutions and partners like UNICEF YuWaah.**

18. PUMPED STORAGE HYDROPOWER

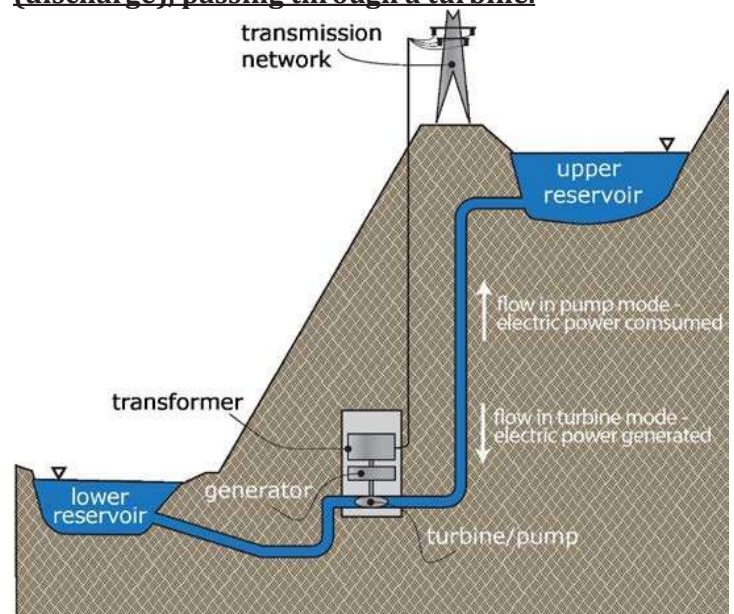
Context:

The **Uttar Pradesh government** has granted **in-principal approval for a 1,200 MW pumped storage power project** in, Sonbhadra district.

- The project will **draw its water supply from the Son River.** It aims **to generate electricity for over 6 hours daily to meet peak demand.**

About Pumped Storage Hydropower:

Pumped storage hydropower (PSH) is a **type of hydroelectric energy storage.** It is a **configuration of two water reservoirs at different elevations** that can **generate power as water moves down from one to the other (discharge), passing through a turbine.**



19. GLOBAL WATER TECH SUMMIT - 2024

Context:

The **Central Water Commission (CWC)** has been awarded the **GEEF Global WaterTech Award for 'Water Department of the Year'** at the **Global Water Tech Summit 2024**, hosted by the **Global Energy and Environment Foundation (GEEF)**.

- This award acknowledges significant achievements in the water sector, **focusing on innovation, technology, conservation, and sustainable development.**
- The CWC was recognized for its **crucial role in hydro-meteorological data collection, flood forecasting, reservoir storage monitoring, water quality monitoring, coastal area management, appraisal and monitoring of water resources projects,** and resolving inter-state water issues.

20. PROJECT TIGER

Context:

A report by the **Rights and Risks Analysis Group (RRAG)** released on **International Tiger Day** highlights that Project Tiger **will displace approximately 5.5 lakh Scheduled Tribes and other forest dwellers.**

- The number of **displaced individuals from tiger reserves has surged dramatically since 2021,** with an **average increase of 967% per protected area.**
- **Smaller displacements are noted in reserves in Tamil Nadu and Rajasthan.**
- The report **criticizes the lack of free, prior, and informed consent** as mandated by the **Forest Rights Act and the Wildlife (Protection) Act of 1972.**

The report also notes **a positive example of coexistence in Karnataka's Biligiri Rangaswamy Temple Tiger Reserve,** where the **Soliga tribe lives harmoniously with tigers, resulting in a significant increase in the tiger population.**



Tiger

Context: India will officially mark the 50th years of 'Project Tiger' on 9 April 2023

World Tiger Day: 29th July

About Tigers (Panthera Tigris)
IUCN: Endangered
WPA: Schedule I
Cites: Appendix I
 Tigers are the largest cat species and is both **flagship and Umbrella species**

Numbers: According to the tiger census of 2019, India has 2967 tigers, of which 526 are in Madhya Pradesh (highest).

Sub species: Traditionally eight subspecies of tigers have been recognized, out of which three are extinct— Caspian tiger, Javan tiger and Bali tiger.

Other sub species are Bengal Tigers, Amur tiger (Amur Rivers region of Russia and China, and North Korea), South China tiger, Sumatran tiger, Indo-Chinese tiger.

Largest Tiger Reserve: Nagarjunsagar Srisaillam Tiger Reserve, Andhra Pradesh

Smallest: Bor tiger reserve in Maharashtra

Highest Density of Tigers: Jim Corbett National Park

To know more Visit Insights IAS Daily CA

21. HOOLOCK GIBBON

Context:

The **Union Environment Ministry's approval for oil and gas exploration** by Cairn India in Assam's Hoolongapar Gibbon Wildlife Sanctuary has raised concerns **about the endangered hoolock gibbon's habitat.**

Key Facts about Hoolock Gibbon:

Facts	Description
About	Gibbons, the smallest and fastest of all apes, inhabit tropical and subtropical forests in Southeast Asia. They have high intelligence, distinct personalities, and strong family bonds. They are one of the 20 gibbon species found worldwide.
Population and Habitat	The current population of hoolock gibbons is around 12,000. They are found in Northeast India, Bangladesh, Myanmar, and Southern China.
Gibbon Species in India	Two distinct species in India's northeast: the eastern hoolock gibbon (Hoolock leuconedys) and the western hoolock gibbon (Hoolock hoolock).

<p>Threats</p>	<p>All 20 gibbon species, including hoolock gibbons, are at high risk of extinction due to conservation challenges. Significant population and habitat decline due to deforestation for infrastructure projects in India.</p>
<p>Conservation Status</p>	<p>International Union for Conservation of Nature's Red List: Western Hoolock Gibbon: Endangered; Eastern Hoolock Gibbon: Vulnerable. Both species are listed on Schedule 1 of the Indian (Wildlife) Protection Act 1972.</p>
	<p>The Global Gibbon Network (GGN) recently convened its inaugural meeting in Haikou, China's Hainan province, to address its critical situation. The GGN was initiated at the International Gibbon Day 2020 event, with representatives from 20 gibbon conservation organizations.</p>
<p>About Hollongapar Gibbon Sanctuary</p>	<p>The Hollongapar Gibbon Sanctuary, formerly known as the Gibbon Wildlife Sanctuary or Hollongapar Reserved Forest, is an isolated evergreen forest in Assam, India. Established in 1997, the sanctuary was initially set aside in 1881, with its forests once extending to the Patkai mountain foothills. It is home to India's only ape and gibbon species, the hoolock gibbons, and the Bengal slow loris, North-eastern India's only nocturnal primate. The forest's upper canopy is dominated by hol-long trees, the middle by nahar trees, and the lower by evergreen shrubs and herbs.</p>

22. STURGEON

Context: A **WWF report** reveals that **poaching and trafficking are critically endangering** four **sturgeon species in the Lower Danube**, a key stronghold in south-eastern Europe.

- Sturgeons are **exploited for caviar and meat**, leading to global population declines.
- The most frequently poached species is the **Endangered sterlet (Acipenser ruthenus)**, followed by

Protection Status:

- IUCN Red list: Two sturgeon species are already extinct** in the Danube, and the remaining **four are listed as Threatened by the IUCN**.
- CITES: Appendix-II.**



23. WOODY ENCROACHMENT

Context:

India's open ecosystems, **such as savannahs and grasslands, face an unusual threat from increased tree cover**, a phenomenon **known as woody encroachment**.

- This encroachment, **driven by human activities that disrupt the natural disturbance regimes** (like grazing and fire), is **changing these ecosystems and threatening their biodiversity**.
- A study highlighted that **increased tree cover in areas like the African savannah** has significantly **reduced native grassland bird populations by more than 20%**.
- Grasslands and savannahs, **covering nearly 40% of the Earth's landmass, are home to many endemic and at-risk species**.
- However, **threats like conversion to agriculture, large-scale development projects, and overgrazing are contributing to their decline**, with trees now emerging as a significant threat.
- Higher atmospheric CO2 levels due to climate change promote the growth of deep-rooted woody plants**, exacerbating the problem.

To combat woody encroachment, **long-term ecological monitoring and more scientific evidence are needed**.

Internal security

24. RANSOMWARE ATTACK

Context:

C-Edge Technologies Ltd., a technology **service provider for cooperative and regional rural banks in India**, was **likely hit by a ransomware attack**.

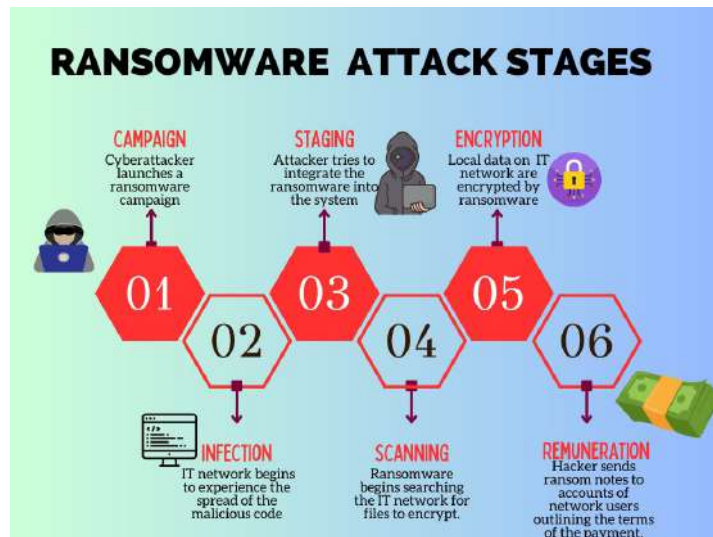
- The **National Payments Corporation of India (NPCI) announced this** and **temporarily suspended all retail payments in the affected banks**.
- The attack **primarily impacts UPI operations and Aadhaar-enabled payment systems (AePS)**, affecting around 200 cooperative banks and regional rural banks (RRBs).

About Ransomware:

Ransomware is a **type of malware that locks users or organizations out of their files by encrypting them and demanding a ransom for the decryption key**.

This **forces victims to pay the ransom to regain access**, with some variants also **stealing data to increase pressure**.

Ransomware **has become a major threat, significantly disrupting hospitals, public services, and various organizations**.



Defence

25. ASIAN DISASTER PREPAREDNESS CENTRE (ADPC)

Context:

India has taken over as Chair of the Asian Disaster Preparedness Centre (ADPC) for 2024-25, with Rajendra Singh from NDMA assuming the role.

Aim: This move aims to strengthen India's leadership in disaster risk reduction and climate resilience.

About ADPC:

The Asian Disaster Preparedness Centre (ADPC) is an **autonomous international organization** focused on **disaster risk reduction and building climate resilience** in Asia and the Pacific. Established in **1986 in Bangkok, Thailand**, its founding members include **India, Bangladesh, Cambodia, China, Nepal, Pakistan, Philippines, Sri Lanka, and Thailand**.

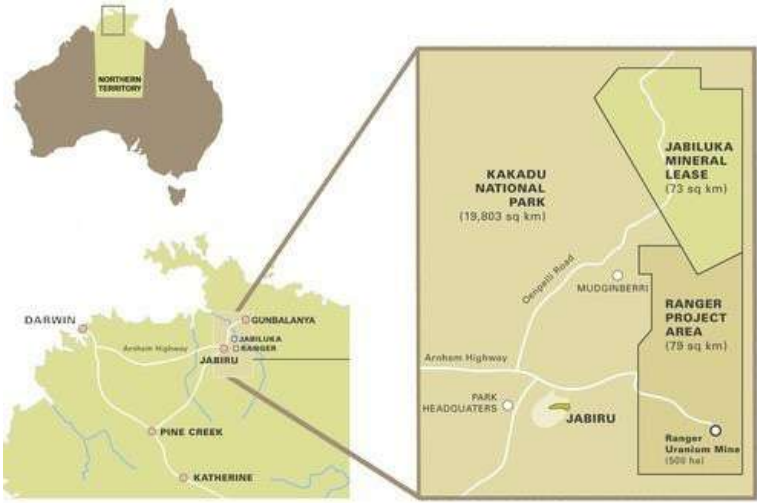

Reports in News

Reports	Description
<p>The Impact of Climate Change on Education</p>	<p>By World Bank</p>
	<p>Key findings: Climate change intensifies extreme weather, disrupting schooling and causing learning losses.</p>
	<p>From 2005-2024, schools closed during 75% of extreme weather events, impacting over 5 million people.</p>
	<p>Rising temperatures and food insecurity also negatively affect learning outcomes and school enrollment.</p>
	<p>Climate events particularly harm girls in low-income countries, preventing at least 4 million from completing their education.</p>
	<p>Adaptation Approaches:</p>
	<p>Climate Resilient Education Management: Invest in early warning systems, e.g., Indonesia’s InaRISK app</p>
	<p>School Infrastructure Resilience: Strengthen buildings, e.g., Rwanda’s retaining walls project.</p>
	<p>Classroom Temperature Management: Implement bioclimatic designs, e.g., Kenya’s Green Economy Strategy.</p>
<p>Learning Continuity: Keep schools open and enhance remote learning, e.g., Ghana’s nearly 100% re-enrollment post-COVID-19.</p>	
<p>The State of Food Security and Nutrition in the World Report, 2024</p>	<p>Report by five UN agencies (FAO, IFAD, UNICEF, WFP, WHO)</p>
	<p>The report focuses on financing to end hunger, food insecurity, and malnutrition. It introduces a new definition for financing food security and nutrition, encompassing public and private, domestic and foreign resources aimed at availability, access, utilization, stability of nutritious foods, and resilience of agri-food systems.</p>
	<p>Current Gaps in Financing: Public spending on agriculture is very low in low-income and lower-middle-income countries. Less than a quarter of official development assistance is directed towards food security and nutrition.</p>
	<p>Status of Food Security and Nutrition: The world is off track to achieve SDG 2 (Zero Hunger). In 2023, 1 in 11 people faced hunger, with 713-757 million undernourished. 28.9% of the global population experienced moderate or severe food insecurity</p>

Reports	Description
Report on Currency and Finance 2023-24	Released by Reserve Bank of India (RBI)
	Theme “ India’s Digital Revolution. ”
	Key Findings:
	Digital Economy: Grew 2.5 times faster than the physical economy, now 15% of global GDP. In India, it’s 10% of GDP, expected to be 20% by 2026.
	Growth Factors: High internet penetration, low data cost, highest mobile data consumption, and a large startup ecosystem.
	Global Rankings: India leads in biometric identification (Aadhaar) and real-time payment volumes.
	Digital Public Infrastructure (DPI): DPI is expanding globally through the MOSIP program and linking UPI with other nations’ systems like Singapore’s PayNow.
	Social Welfare: DPI has helped bridge economic inequalities, lifting 415 million people from poverty between 2005-2021 (UNDP, 2023).
	Challenges: Consumer complaints about digital payments make up 47% of RBI ombudsman cases. Data breach costs in India rose to \$2.18 million in 2023, and misleading digital designs manipulate users.
Suggestions: Self-Regulatory Organizations (SROs): Promote ethics in FinTech; Scaling Cyber Infrastructure: Improve security for rising transactions; Data Localization: Regulate storage of critical data within India.	
The State of the World’s Mangroves 2024” Report	Released by Global Mangrove Alliance
	On World Mangrove Day (July 26) , a report highlighted that Southeast Asia holds about a third of the world’s mangroves, with Indonesia having 21% . Many mangroves face threats, including those in Lakshadweep and Tamil Nadu.
	Loss drivers include climate change, industrial shrimp farming, and conversion for agriculture. Mangroves are crucial for biodiversity, carbon storage, disaster protection, and water quality.
	Mangroves support over 5,700 species, act as carbon sinks storing 394 tonnes of carbon per hectare, reduce flood depths, and improve water quality by filtering pollutants.

MAPPING

INTERNATIONAL

Place	Why in News?
<p>1. JABILUKA URANIUM SITE (AUSTRALIA)</p>	<p>Context: Australia has banned mining at the Jabiluka uranium site, located within Kakadu National Park, in a victory for the Indigenous Mirarr people who have fought for decades to protect their land. This decision aligns with the wishes of the Mirarr, who have cared for the land for over 60,000 years.</p> <p>Australia has around one-third of the world's uranium deposits. Uranium deposits in India are primarily found in crystalline rocks. Jharkhand state holds 70% of the country's uranium reserves.</p> 
<p>2. GOLAN HEIGHTS (ISRAEL)</p>	<p>Context: Israel conducted air strikes on Hezbollah targets in Lebanon after a rocket attack killed 12 young people playing football in Majdal Shams, Golan Heights</p> <p>About Golan Heights (or simply the Golan) It is a strategic basaltic plateau in the southwest corner of Syria. It is bordered by the Yarmouk River in the south, the Sea of Galilee and Hula Valley in the west, the Anti-Lebanon mountains with Mount Hermon in the north, and Wadi Raqqad in the east. Two thirds of the area was occupied by Israel following the 1967 Six-Day War and then effectively annexed in 1981, which was rejected by the international community that continues to consider the territory as Syrian and under Israeli occupation.</p> 

3. GOBI DESERT (CHINA)

Context: China is set to **build the world's first nuclear power plant** using molten thorium salt in the **Gobi Desert, aiming for operation by 2025.**

About Thorium-based nuclear power station:

It **utilizes thorium instead of uranium as fuel.** Unlike uranium, thorium must first be converted to U-233 in a reactor to produce nuclear energy. This station's reactor uses **liquid salt or carbon dioxide for heat transfer** and electricity generation, eliminating the need for water cooling and significantly reducing the risk of meltdowns. It will also be the first molten salt reactor since the **United States shut down its test reactor in 1969.**

About the Gobi Desert:

It is a vast, arid region in **northern China and southern Mongolia.** It's known for its dunes, mountains and rare animals such as snow leopards and **Bactrian camels.** In the Gobi Gurvansaikhan National Park, the Khongoryn Els sand dunes are said to sing when the wind blows. The park also features the deep ice field of Yolyn Am canyon. Dinosaur fossils have been found at the red "Flaming Cliffs" of Bayanzag.



4. CHINA COMPLETES BRIDGE NEAR PANGONG LAKE

Context: China has constructed a **400-meter bridge near the Line of Actual Control (LAC)** in Ladakh, facilitating **rapid movement of Chinese troops between the North and South banks of Pangong Lake.**


This bridge, situated in territory **held by China since 1958,** reduces travel distance by 50-100 kilometres. The Indian Ministry of External Affairs reiterated that this area has been under illegal occupation by China for about 60 years.

About Pangong Lake:

It is an endorheic lake spanning eastern Ladakh and West Tibet situated at an elevation of **4,225 m.** It is 134 km long and divided into five sub lakes, called **Pangong Tso, Tso Nyak, Rum Tso and Nyak Tso**



INDIAN

Place	Why in News?
<p>1. KRISHNA RAJA SAGAR (KRS) DAM</p>	<p>Context: Karnataka has begun releasing Cauvery water to Tamil Nadu from the Krishna Raja Sagar (KRS) dam and Kabini reservoir, following a directive from the Cauvery Water Management Authority (CWMA).</p> <p>Krishnaraja Sagar (KRS) Dam:</p> <ul style="list-style-type: none"> • Type: Gravity dam on the river Kaveri and tributaries Hemavathi and Lakshmana Theertha in Mandya, Karnataka. • Construction: Named after Maharaja Krishna Raja Wadiyar IV, built between 1911 and 1931, designed by Sir M. Visvesvaraya. • Objectives: Irrigation, hydroelectric power, drought mitigation. • Features: 2,621 meters long, 40 meters high, with 177 arch-type iron sluices, some automatic. Constructed with stone masonry and surki mortar. • Reservoir: Covers 130 sq. km, Brindavan Gardens attached. • Usage: Main source of irrigation for Mysore and Mandya, drinking water for Mysore and Bangalore, and power for the Shivanasamudra station. Water flows to Tamil Nadu's Mettur dam.  <p>INDIA LOCATION MAP OF KRISHNA RAJA SAGARA DAM</p> <p>LEGEND</p> <ul style="list-style-type: none"> — International Boundary --- State Boundary ● Dam Location <p>Map not to Scale Copyright © 2015 www.mapsofindia.com (Updated on 22nd January 2015)</p>