



drishti

Current Affairs (CONSOLIDATION)

**MAY 2024
(PART – II)**

Drishti, 641, First Floor, Dr. Mukharjee Nagar, Delhi-110009
Inquiry (English): 8010440440, Inquiry (Hindi): 8750187501
Email: help@groupdrishti.in

Contents

Polity and Governance	6
Hyperpoliticisation of Indian Higher Education.....	6
Alternative Voting Methods.....	8
Election Rules for State-Owned Media	11
Power of ECI to Deregister Political Party	11
Self-Help Groups	13
Disenfranchisement of Undertrials in India	14
Police as Last Resort in Marital Dispute	17
Digital Arrest Scams	19
SC Limits ED's Arrest Powers in PMLA Cases.....	20
Spices Board of India	22
SC Declines Plea Against Collegium System	23
Tea Board of India	25
Smart Cities Mission	26
India in Trade Deficit with Top Trading Partners	29
Economic Scenario	29
Farm Loan Waivers in India	30
Competition in Digital Markets	33
Reforming India's Informal Labour Market	34
India's Service Sector	36
Political and Economic Reforms in 1991	38
Rising Debt Strained Household Savings.....	40
India's Critical Mineral Acquisition Plans in Africa	43
Need for New Agriculture Export-Import Policy	45
US Federal Reserve Keeps Rates Steady as Inflation Persists.....	48
RBI Surplus Transfer to Government.....	50
Consumption Comparison of India-China	52
Indian Manufacturing Needs Product Sophistication.....	55
Regional Economic Outlook for Asia And Pacific Report: IMF.....	56
India's Target of USD 1 Trillion Goods Exports by 2030	59
Global Trade Update: UNCTAD	61
India's E-commerce Market	62
Employment Trends in India	65
Factors Shaping Global Gold Prices	67
Dag Hammarskjöld Medal and International Day of UN Peacekeepers.....	69
International Relations	69
Socio-Economic Factors Fueling Unrest in PoK	70
BIMSTEC Charter	72

Note:

Arrest Warrants Against Israel and Hamas Leaders	75
India's Contribution to Counter-Terrorism Efforts	76
Chabahar Port Agreement	78
Tobacco Epidemic in India	81
Social Issues	81
Menstrual Hygiene in Indian Prisons	84
World Bank Report on Global Water Crisis	85
Early Cancer Detection in India and CRC Tumour Breakthroughs	88
Packaged Food and Health Concerns	90
Recombinant Proteins Using Monosodium Glutamate	92
Science & Technology	92
Sympatric Speciation	93
Working of Anaesthetic Drugs in the Brain	94
Space Tourism	95
X Chromosome	97
Tokyo Atacama Observatory	100
China's High Energy Photon Source	101
Global Report on Neglected Tropical Diseases 2024	102
Amplifying the Global Value of Earth Observation	104
GPT-4o	106
World Wildlife Crime Report 2024	107
Environment and Ecology	107
Sailfin Armoured Catfish	111
Paris Agreement Climate Finance Target for 2022	112
IUCN Report on Mangrove Ecosystems	115
Flamingos, Himalayan Ibex and Blue Sheep	117
Olive Ridley Turtle	119
Microplastics	121
International Atomic Energy Agency (IAEA)	122
Initiative to Eliminate Mercury-Containing Medical Devices	124
Harnessing Biomass Cultivation on Degraded Land	125
Sariska Tiger Reserve	127
19th Session of United Nations Forum on Forest	128
Lion-Tailed Macaques	129
Issue of Solid Waste Management	131
Sundarbans	132
Pine Needle Power Projects	133
Mining in Aravalli Range	134
Transnational Organised Crime	136
Security	136
Indian Navy Sheds Colonial Legacy	138

Note:

Naga Insurgency	139
Inter-Services Organisations Act	141
Restoration of Virupaksha Temple Pavilion	143
Art and Culture	143
Wooden Artifacts of Stone Age	145
History	145
Solar Storms	147
Geography	147
Cyclone Remal	148
Influence of Wind Shear on Hurricanes	150
Global Impact of Land Squeeze	152
Industrial Accidents.....	156
Disaster Management	156
Fire Safety in India.....	158
Ethical and Procedural Lapses in Kerala Surgical Incident	161
Ethics	161
Sahitya Akademi Fellowship to Ruskin Bond.....	162
Miscellaneous	162
Deceptive Practices in the FMCG Industry	164
Rapid Fire Current Affairs.....	164
ADB's Commitment to India's Development.....	165
Calcutta HC Quashed OBC Quota for Muslims	165
Global Unemployment Rate to Marginally Decrease in 2024	166
India's Aid to Papua New Guinea	166
ESA and Twelve Countries Sign the Zero Debris Charter.....	167
PRAVAAH Portal	167
NASA's PREFIRE Mission.....	167
PRAGATI-2024	167
Microcephaly.....	169
Spherical Shape of Planets	169
Electroreception in Caterpillars.....	169
Gliese 12 b Potentially Habitable Exoplanet near Earth.....	169
Spain becomes 99th Member of ISA	170
Launch of RuPay Services in Maldives.....	170
Astronomical Transients.....	171
Extending Tenure of Current Army Chief	171
United Nations Department of Safety and Security.....	171
CSIR-CMERI's Innovative Electric Tiller.....	172
ICJ Orders Israel to Cease Military Actions in Rafah.....	173

Note:

AI Krish and AI Bhoomi.....	174
Explosive Substances Act and Peroxide Chemicals	174
Joint Parliamentary Committee (JPC).....	174
Brain-eating Amoeba	175
Ireland, Norway, and Spain to Recognize Palestine	175
IMD Colour-Coded Warnings	176
Cancer Drugs Tislelizumab and Zanubrutinib.....	177
National Council for Cement and Building Materials-Incubation Centre	178
Electric Vertical Take-off and Landing Aircraft	178
R21/Matrix-M Malaria Vaccine	178
Buddha Purnima.....	179
Matua Community	179
Mystery Behind Venus' Extreme Dryness	180
International Booker Prize 2024.....	180
International Day of Biodiversity.....	181
Manipur Thangjing Hills Dispute	181
Manipuri Pony.....	181
SC to Revisit 1995 Order of Consumer Court.....	182
Humboldt Glacier	182
Kharkiv and Kyiv Region	183
Massive Fire at Union Carbide Plant	183
Indian Army Gets AK-203 Rifles.....	183
World Telecommunication and Information Society Day	184
Stellar Nucleosynthesis	184
Centre Granted Citizenship Under CAA.....	185
Football Legend Sunil Chetri.....	185
Bleaching of Sea Anemone.....	186
Nobel Prize Laureate Alice Munro.....	187
7th Edition of Exercise Shakti	189
Soil Nailing and Hydroseeding for Landslide Prevention	189
World Lupus Day 2024	189
Tileswari Koch-An Unsung Hero of Assam	190
Nakuru Dam	190
Liquid Nitrogen.....	191
Sperm Whales	191
Interim Bail to Delhi Chief Minister.....	191
Quotas for PwDs in All Trains	192
Visit of Indian Naval Ships to Malaysia.....	193
Red Colobus.....	193
Project ISHAN	194
Tartessos Civilization	194
World Migration Report 2024	194
NOTTO-ID	195
Glycemic Index and Glycemic Load	195
World Hydrogen Summit 2024.....	196

Note:

Polity and Governance

Highlights

- Hyperpoliticisation of Indian Higher Education
- Alternative Voting Methods
- Election Rules for State-Owned Media
- Power of ECI to Deregister Political Party
- Self-Help Groups
- Disenfranchisement of Undertrials in India
- Police as Last Resort in Marital Dispute
- Digital Arrest Scams
- SC Limits ED's Arrest Powers in PMLA Cases
- Spices Board of India
- SC Declines Plea Against Collegium System
- Tea Board of India
- Smart Cities Mission

Hyperpoliticisation of Indian Higher Education

Why in News?

Indian higher education has a long history of intertwining with political agendas. This trend has only intensified in recent years, impacting various aspects of academic life and institutional integrity.

How have Politics Shaped Indian Higher Education?

- **Political Foundations:** Indian higher education institutions have long been influenced by political agendas, with **politicians founding colleges** to bolster their careers.
- **Electorate Demands:** Many institutions were created to meet the **socio-cultural demands of the electorate**, reflecting the diverse and complex nature of Indian society.
 - Governments have placed **educational institutions in politically advantageous locations**, often catering to socio-cultural demands.
- **Naming and Renaming:** The naming and renaming of universities, particularly by state governments, are frequently driven by political motives.
 - Example: The Uttar Pradesh Technical University (UPTU), Lucknow was renamed several times.
- **Appointments and Promotions:** Academic appointments and promotions have sometimes been **influenced by political considerations rather than the qualifications and merits of candidates**.

- Several Indian states are showing dissent over appointment of state **governors as chancellors** for state universities.

- **Academic Freedom:** While norms of academic freedom have not always been strictly followed, especially in undergraduate colleges, universities have generally adhered to international norms, allowing professors to teach, research, and publish freely.
 - **Self-censorship is becoming prevalent**, especially in the social sciences and humanities. Prominent academics have faced repercussions for publishing controversial material.

Higher Education in India

- Higher education in India refers to **tertiary level education** provided after 12 years of schooling.
- India has the **world's second largest higher education system** with over 58,000 higher education institutions.
- There are now 43.3 million students enrolled for higher education. Nearly **79% of students are enrolled in undergraduate courses with 12% at the postgraduate** (master's degree) level. Only 0.5% were studying for a PhD, with most of the rest studying for sub-degree diploma programmes.
 - The most popular undergraduate subject area is Arts (34%), followed by Science (15%), Commerce (13%), and Engineering & Technology (12%).
 - At the postgraduate level, the top subject area is Social Science (21%), followed by Science (15%) and Management (14%). For PhD level, the largest number of students are enrolled in Engineering & Technology (25%), followed by Science (21%).

Note:

- The **higher education participation rate (GER) has risen to 28.4%**, a 1.1% increase from 2020-21.
 - The top States/Union Territories with highest GER are Chandigarh, Puducherry, Delhi, Tamil Nadu, Himachal Pradesh, Uttarakhand, Kerala, and Telangana.
- The total number of foreign students in Indian institutions was around 46,000 in 2021-22.

What are the Consequences of Hyperpoliticisation of Education?

- **Reduced Academic Freedom:** There's a growing concern that political influence could **undermine academic freedom**, with faculty and students potentially facing pressure to align with the political ideology.
 - **Liz Magill, president of the University of Pennsylvania**, testified before a U.S. Congressional committee on the **issue of antisemitism on college campuses**. Under pressure from wealthy donors and alumni, **she resigned**.
- **Global Reputation:** A politicised academic environment may **deter talented students and faculty** from enrolling or working in Indian institutions. This could hinder India's efforts to become a global leader in higher education.
- **Reduced Diversity of Thought:** When political agendas dominate academic discourse, it can lead to a **stifling of open debate and a reluctance to explore alternative viewpoints**.
- **Potential for Student Activism:** Increased politicisation can lead to **student activism** aligned with or against the political party. While **student activism can be positive**, it can also **disrupt academic life if it becomes overly politicised**.
- **Erosion of Public Trust in Academia:** When universities are seen as pawns in political games, **public trust in the value and objectivity of academic research** can erode. This weakens the **legitimacy of academic expertise** in shaping public policy.
- **Reduced Research Funding:** Politicians with short-term agendas may be less likely to **invest in long-term research projects** with uncertain commercial applications.
 - This can stifle innovation and India's ability to compete in the global knowledge economy.

- **Reduced Employability:** Employers increasingly value **skills like critical thinking, problem-solving, and adaptability**. A hyper-politicised education that prioritises ideology over these skills can leave graduates less prepared for the workforce.

What can be done to Mitigate Political Interference?

- **Institutional Autonomy:** Strengthening institutional autonomy is key to resisting undue influence. Encourage **universities to diversify funding sources** to reduce dependence on government funds.
 - Uphold academic freedom as a non-negotiable principle, ensuring free discourse and research.
 - Establish **autonomous university boards** that lead to higher research quality, particularly in disciplines susceptible to political influence.
 - In line with **India's push for world-class universities**, institutions should strive for **autonomous status**.
 - This empowers them to design innovative curriculums, seek diverse funding sources, and compete for recognition as **Institutions of Eminence under the UGC Act 2017**, ultimately fostering a more dynamic and competitive higher education landscape in India.
 - Implement the recommendations of the **National Knowledge Commission (NKC), 2005** and **Yash Pal Committee (2009)** to grant **greater autonomy to higher education institutions** in academic, administrative, and financial matters.
 - NKC recommends **reforming existing universities**: update curricula every three years, use internal assessments, adopt a course credit system, and attract talented faculty.
 - Establish Central and State Boards of Undergraduate Education for curricula and examinations.
 - Create an **Independent Regulatory Authority for Higher Education (IRAHE)** independent of stakeholders, established by an Act of Parliament.
- **Depoliticise Governing Bodies:** An independent selection process for selecting **vice-chancellors** and other key positions, based on academic merit and experience, can reduce political influence.
 - **National Education Policy (NEP) 2020** makes recommendations for **motivating, energising, and building the capacity of faculty** through **clearly**

Note:

defined, independent, transparent recruitment, freedom to design curricula/pedagogy, incentivising excellence, and movement into institutional leadership. **Faculty not delivering on basic norms will be held accountable.**

- This can help ensure that decisions are made in the best interests of the institution and its students, rather than for political gain.
- **Protect Dissent and Critical Inquiry:** Uphold the **right of faculty to engage in research and express views** without fear of retaliation or censorship is crucial for maintaining the integrity of higher education.
 - Clear policies and safeguards should be in place to protect academic freedom.
- **Student Union Independence:** Ensure university student unions remain autonomous bodies elected by students, without interference from political parties or authorities in their elections or functioning.
- **Empowered Ombudsman:** Establish an **independent ombudsman mechanism to investigate and address complaints** of political interference, academic freedom violations or politically motivated harassment from any stakeholders.

Regulatory Framework for Higher Education in India

- India's higher education system is overseen by various statutory bodies under the purview of the **Ministry of Education** at the Central and State levels, which are responsible for maintaining the quality and standards of higher education.
- **Main Regulatory Bodies:**
- **University Grants Commission (UGC):** A statutory body established in 1956, apex body responsible for coordinating and maintaining standards and release of grants in university education.
 - The Commission **advises the Central and State Governments on measures for Higher Education development.**
 - It operates from New Delhi and has six Regional offices in Bangalore, Bhopal, Guwahati, Hyderabad, Kolkata, and Pune.
- **All India Council for Technical Education (AICTE):** Established in 1945 as an advisory body and later given statutory status in 1987.
 - It approves new technical institutions, courses, and intake capacity, and delegates some powers to state governments for diploma-level institutions.

- It sets norms and standards, accredited institutions, and promotes technical education through various schemes.

- The **AICTE is headquartered in New Delhi** with regional offices in Kolkata, Chennai, Kanpur, Mumbai, Chandigarh, Bhopal, Bangalore, and Hyderabad.

- **Council of Architecture (COA):** Established by the Government of India under the **Architects Act, 1972**. It is responsible for **registering architects and ensuring the maintenance of standards for recognized qualifications.**

- Governs the standards of architectural education and practice in India.

- **Recent Developments in the Regulatory Framework:**

- **National Education Policy (NEP) 2020:** Proposes the establishment of the **Higher Education Commission of India (HECI)** as a single overarching body for all higher education, excluding medical and legal education. HECI will consist of four independent verticals:

- **National Higher Education Regulatory Council (NHERC)** for regulation.
- **General Education Council (GEC)** for standard setting.
- **Higher Education Grants Council (HEGC)** for funding.
- **National Accreditation Council (NAC)** for accreditation.

- HECI will operate through technology-based intervention and will have the **authority to penalise higher education institutions that do not comply with norms and standards.**

- Both public and private higher education institutions of national importance will be subject to the same regulations, accreditation, and academic standards.

Alternative Voting Methods

Why in News?

Recently, voters have been polling in the world's largest election, the general election to elect members of the 18th Lok Sabha in India, taking place over seven phases.

Note:

What are the Alternative Methods of Voting Available to Citizens?

➤ Voting Process under the RPA:

- The **Representation of the People Act, 1951 (RPA)** mandates **in-person voting** at assigned polling stations using **Electronic Voting Machines (EVMs)**, with exceptions for certain voters to ensure **universal suffrage**.

➤ Postal Ballot: 'Postal ballot' allows voters who cannot be physically present in polling stations to vote remotely, as specified in **Section 60 of the RPA**.

- This method differs from normal voting in **three ways**:
 - Polling takes place outside the polling station
 - It takes place without EVMs
 - Polling takes place before the designated poll date in the constituency.
- **Eligibility:** As per **Rule 18 of The Conduct of Election Rules, 1961**, the following classes of persons are entitled to vote by postal ballot:
 - **Special Voters:** Individuals holding **declared office** under **Section 20(4) of RPA**, including the **President, Vice President, Governors**, Cabinet Ministers, other high-ranking dignitaries, etc. and their spouses.
 - **Service Voters:** Members of the **Indian armed forces**, paramilitary forces, an armed state police member serving outside their state, or a government employee stationed abroad and their spouses residing with them.
 - **Voters on Election Duty:** All individuals from Commission officials to private personnel involved in polling duties are included.
 - **Absentee Voters under Section 60(c) of RPA 1951:** In 2019, the **Election Commission** established the '**Absentee Voters**' category encompassing **senior citizens** aged 85+, persons with disabilities with at least 40% disability, **Covid-19** suspect or affected individuals, and essential services workers such as railways, telecom, electricity, health, traffic, aviation, fire services, and authorised media personnel.
 - **Under Preventive Detention:** Electors subjected to **preventive detention**.
- **Application Process:** Eligible individuals for postal voting must formally apply within a specified timeframe, while service voters and those under Preventive Detention **receive postal ballots** automatically and cannot vote in person once issued.

- **Electronically Transmitted Postal Ballot System (ETPBS):** In 2016, an amendment to **Rule 23** introduced the Electronically Transmitted Postal Ballot System (ETPBS) for **Service Voters**, facilitating faster delivery of postal ballots through encrypted electronic transmission and free return via post.

○ Process:

- **Rule 18A, introduced in 2022**, mandates voters on election duty to vote at designated Facilitation Centers using postal ballots.
- Similarly, an appropriate venue and room for the **Postal Voting Centre (PVC)** are identified to facilitate voting by absent voters in the **Essential Services (AVES)** category.

➤ Home Voting:

- **Criterion:** Over 81 lakh 85+ aged voters and 90 lakh PwD voters are registered in the electoral roll nationwide.
- **Process:** For absentee voters in the category of senior citizens (AVSC) and PWDs over 85, and **Covid-19** Suspect/positive, Booth Level Officers (BLOs) deliver Form 12D and compulsorily obtain acknowledgments from them.

➤ Miscellaneous:

- **Voting in a Different Polling Centre:** When an election worker is assigned to their registered constituency, they receive an Election Duty Certificate allowing them to vote at their assigned polling station; otherwise, they're eligible for a postal ballot.
- **Proxy voting:** Armed and paramilitary service members can vote via proxy or postal ballot; those opting for proxy are termed 'Classified Service Voters'.
- **Assisted Voting:** In case of voter disability, the Presiding Officer may permit a companion over 18 to vote on their behalf, with indelible ink applied to the companion's right index finger.

Disqualification from the Voting Process

- Individuals who are convicted of offences committed under **Section 171E** (which deals with bribery) and **Section 171F** (which deals with personation or undue influence at an election) of the **Indian Penal Code** are disqualified from participating in elections.
- Those convicted of offences under **Section 125** (which deals with various electoral offences), **Section 135**, and **Section 136** of the **Representation of the People Act, 1951** face disqualification from elections.
- **If an individual votes in more than one constituency, his vote is disqualified.**

Note:

Election Commission of India (ECI)

About

- **Autonomous Constitutional Authority** - Administers Union/state election
 - LS, RS, State LA, the offices of the President and VP
- Estd - **25th Jan 1950** (National Voters' Day)



Constitutional Provisions

Part XV - Article 324 to 329

Structure

- 1 Chief Election Commissioner and 2 Election Commissioners **appointed by President**
- **Tenure- 6 years, or up to the age of 65 years**, whichever is earlier
- Retiring ECs – **eligible for further appointment by the govt.**
- **Removal of CEC-** Resolution on the ground of **proven misbehaviour or incapacity**, with majority of 2/3rd members present and voting, supported by more than 50% of the total strength of the house



Major Roles and Responsibilities



- Determining Electoral Constituencies
- Preparing/Revising electoral rolls
- Notifying the schedules and dates of elections
- **Registering political parties and granting them the status of national or state parties**
- Issuing the Model Code of Conduct (MCC) for political parties
- Advising the President on **matters concerning the disqualification of MPs**

Challenges

- Truncated Tenure of CEC
- Executive Influence in Appointments
- Dependence on Centre for Finance
- Lack of Independent Staff

Election Rules for State-Owned Media

Why in News?

Recently, two opposition leaders accused **state-owned media of censoring their speeches during the ongoing Lok Sabha elections.**

- However, according to a **Prasar Bharati official**, the televisions and radio networks were simply following rules set by the **Election Commission of India (ECI)** regarding the use of state media by recognised parties during elections.

What are the Rules for Political Parties Using State-Owned Media?

- Allocation of Time on State Media:
 - Recognised political parties have been allowed to freely use state-owned television and radio during polls **since the 1998 Lok Sabha elections.**
 - The ECI decides the time allocation for each recognised **national and state party** before the start of the election campaign.
 - National parties collectively receive a minimum of 10 hours on Doordarshan's national channel and 15 hours on regional channels. They also get 10 hours on AIR's national hook-up and 15 hours on regional AIR stations.
 - State parties get a minimum of 30 hours on regional Doordarshan channels and AIR radio stations.
- Guidelines on Speech Content:
 - Parties and speakers must submit speech transcripts 3-4 days in advance for approval by respective **All India Radio (AIR) and Doordarshan (DD) authorities.**
 - ECI Guidelines Prohibit:
 - Criticism of other countries;
 - Attack on religions or communities;
 - Obscene or defamatory content;
 - Incitement of violence;
 - Contempt of court;
 - Aspersions against the President and judiciary;
 - Anything affecting national unity and integrity;
 - Criticism of individuals by name.

Note:

- The ECI allocated broadcast and telecast time to six national parties and 59 state parties for the 2024 elections. National parties received 4.5 hours on Doordarshan and AIR, with the remaining 5.5 hours **based on their vote share in the 2019 Lok Sabha elections.**

Prasar Bharati

- It is a **statutory autonomous body** established under the **Prasar Bharati Act in 1997.** It is the Public Service Broadcaster of the country.
- It comprises **two main wings:**
 - **All India Radio (AIR):** The national radio broadcaster with a vast network of stations across the country.
 - **Doordarshan (DD):** The national television broadcaster offering a mix of national, regional, and local programming.
- AIR and DD were earlier media units of the **Ministry of Information and Broadcasting.**

Power of ECI to Deregister Political Party

Why in News?

Recently, the **Election Commission of India (ECI)** reported on the enforcement of the **Model Code of Conduct (MCC)**, emphasising that **star campaigners** are expected to lead by example and not disrupt societal harmony.

- This statement has sparked a debate about the ECI's **authority** to address MCC violations including the ability to deregister parties.

What does the Deregistration of Political Parties Mean?

- **About:**
 - **Deregistration** refers to the **withdrawal of recognition** of a political party by the ECI.
 - Such parties are simply declared as **registered-unrecognised parties.**
 - These parties are eligible to contest the election but **loses the privileges of the recognised party.**

Note:

- The ECI has the power to derecognise a political party if it **violates the provisions of the Indian Constitution** or the **Representation of the People Act, 1951**.
- **Recognised Party:**
 - A registered party is referred to as a **Registered Unrecognised Political Party (RUPP)**.
 - Political parties are recognised as a **'national'** or **'State'** party under the provisions of The **Election Symbols (Reservation and Allotment) Order, 1968 (Symbols Order)** by the ECI.
 - The criteria for recognition at the **'national'** or **'State'** level consists of **winning a requisite number of seats** and/or obtaining a required **percentage of votes** in a general election to **Lok Sabha (LS)** or **State Assembly (SA)**.
 - At present, there are **six 'national' parties**, and **sixty-one 'State' parties** that have been recognised.
 - These **recognised parties** enjoy additional concessions of having a reserved symbol during elections and **forty 'star campaigners'**.
 - They are also **allowed to freely use state-owned television and radio during polls** since the 1998 Lok Sabha elections.
- **Grounds for Derecognition of a Political Party as a National Party:**
 - If the party fails to secure **at least 6% of the total**

- votes** polled in the general election to the LS or the legislative assembly of the state concerned, and if it fails to have at least 4 MPs elected in the last LS polls (also, it doesn't win 1 seat in the LS from the same state.); or
- If it has won at least 2% of the total seats in the LS from at least 3 states.
- If it fails to secure 8% of the total valid votes polled in the state at a General Election to the LS from the state or to the State LA.
- If the party fails to submit its audited accounts to the ECI on time.
- If the party fails to hold its organisational elections (Inner party election) on time.

POLITICAL PARTY SYSTEM

Groups of like-minded individuals voluntarily organise to gain political power through constitutional means, aiming to promote the national interest

- **Three Types of Party Systems** : One Party (China), Two Party (USA), Multi-Party (India)
- **Parties in India:**
 - **National (6)** : E.g. Aam Aadmi Party (AAP), Bharatiya Janata Party (BJP), Indian National Congress (INC), Bahujan Samaj Party (BSP), Communist Party of India (Marxist) (CPI-M), and National People's Party
 - **State** : E.g. DMK, AIADMK, Telugu Desam, Shiv Sena, Asom Gana Parishad, Mizo National Front, etc.
- **Recognised national/state parties** allotted a symbol exclusively reserved for its use in their respective jurisdiction

Criteria for National Party Recognition

- Secures 6% of valid votes (VV) polled in any 4 or more states at a general election (GE) to the Lok Sabha (LS)/Legislative assembly (LA)+it wins 4 seats in the LS from one or more states
- If it wins 2% of seats in LS at a GE (from 3 states)
- If it is recognized as a state party in 4 states.

Criteria for State Party Recognition

- If it secures 6% of the VV polled in the state at a GE to the LA+ it wins 2 seats in LA of the state concerned; or
- If it wins 3% of seats in the LA at a GE to the LA of the state concerned or 3 seats in the LA, whichever is more; or
- If it secures 8% of the total VV polled in the state at a GE to the LS from the state or to the LA of the state.
- If it secures 6% of the VV polled in the state at a GE to the LS from the state concerned+ it wins 1 seat in the LS from the state concerned; or
- If it wins 1 seat in the LS for every 25 seats or any fraction thereof allotted to the state at a GE to the LS from the state concerned; or



Note:

- Under **Paragraph 16A of the Symbols order, 1968**, the ECI has the power to **suspend or withdraw recognition of a recognised political party** for its failure to observe MCC or follow lawful directions of the Commission.

What does the Deregistration of the Political Party Mean?

- **About:**
 - Deregistration refers to the cancellation of the registration of a political party.
 - However, the ECI is not empowered to de-register parties.
 - Once a political party is deregistered, it cannot contest elections.
- **Registered Parties:**
 - **Section 29A** of the **Representation of the People Act, 1951 (RP Act)** lays down the requirements for registration of a political party with the ECI.

Note:

- Any political party that seeks registration should submit a copy of its constitution.
 - Such document should declare that the party shall **bear true faith** and allegiance to the Constitution of India.
 - It should also bear allegiance to the **principles of socialism, secularism, and democracy**, and uphold the sovereignty, unity and integrity of India.
- **Registered political parties enjoy the following legal benefits:**
 - Tax exemption for donations received under **Section 13A** of the **Income Tax Act, 1961**.
 - **Common symbol** for contesting general elections to the Lok Sabha/State Assemblies
 - **Twenty 'star campaigners'** during the election campaign.
- As per the ECI, there are **2,790 active registered political parties in India**.
- **Grounds for Deregistration of a Political Party:**
 - **A party can only be de-registered if:**
 - Its registration was obtained by fraud
 - It is declared illegal by the Central Government
 - A party revises its internal Constitution and refuses to comply with the Indian Constitution.
- **Power of ECI:** The **RP Act does not give the ECI the authority to deregister** a political party for not contesting elections, holding inner-party elections, or submitting required returns.
 - The **Supreme Court** in the **Indian National Congress vs the Institute of Social Welfare, 2002**, held that the ECI does not have the power to **de-register any political party under the RP Act**.

What is the Need of Deregistration of Political Parties?

- **Less than one-third of Registered Unrecognized Political Parties (RUPPs) participate in elections.**
 - It raises concerns over the **possible misuse of income tax exemption** and donations collected being used for money laundering.
- Recognized political parties often **breach the MCC, but the ECI can only bar leaders from campaigning for a brief period.**
 - The MCC prohibits exploiting caste and communal sentiments for votes, as well as voter bribery and intimidation.

- Deregistration mechanisms ensure **electoral integrity** and accountability by **removing inactive entities, thus enhancing transparency** and fairness.
- The proliferation of **registered but inactive political parties undermines democracy** by diluting the electoral process, **lacking genuine participation**.

Self-Help Groups

Why in News?

- Recently, the **26th anniversary** of the **Kudumbashree mission**, a SHG, was celebrated in Kerala.
- Established in 1998, Kudumbashree currently comprises 46.16 lakh members across three lakh neighbourhood groups, originally focused on **women's enterprises** but now offering legal aid, counselling, loans, cultural engagements, and participating in **disaster relief efforts**.

What are Self Help Groups (SHGs)?

- **About:**
 - A Self Help Group is a **self-governed, peer-controlled information group of people with similar socio-economic backgrounds** and a desire to collectively perform common purpose.
 - An SHG normally **consists of not less than five persons** (with a maximum of twenty) of similar economic outlook and social status.
- **Origins of Self-Help Groups in India:**
 - **Early Efforts (Pre-1970s):** There were **scattered instances** of informal SHGs, particularly among women, for collective action and mutual support.
 - **SEWA (1972):** The **Self-Employed Women's Association (SEWA)**, established by Ela Bhatt, is often considered a defining moment.
 - It organised poor and self-employed women workers, providing a platform for income generation and advocacy.
 - **MYRADA and Pilot Programs (Mid-1980s):** In the mid-1980s, Mysore Resettlement and Area Development Agencies (MYRADA) pioneered SHGs as a microfinance strategy to provide credit to the poor, especially women in rural areas.
 - **NABARD and SHG-Bank Linkage (1992):** The **National Bank for Agriculture and Rural Development (NABARD)** launched the **SHG-Bank Linkage Programme** in 1992.

Note:

- This initiative connected SHGs with **formal banking institutions**, enabling access to credit and financial services for various groups.
- **Government Recognition (1990s-Present):** Since the 1990s, the Government has actively supported SHGs through various schemes like **Swarn Jayanti Gram Swarozgar Yojana (SGSY)** and the **National Rural Livelihoods Mission (NRLM)**.
 - These initiatives have significantly expanded the reach and impact of the SHG movement in India.
- Government Initiatives and Policies Supporting SHGs:
 - **Deen Dayal Antyodaya Yojana – National Rural Livelihoods Mission (DAY-NRLM)**
 - **SHG-Bank Linkage Programme (SBLP)**
 - **Mission for Financial Inclusion (MFI)**

What has been the Impact of SHG on Women?

- **Economic Empowerment:**
 - SHGs have significantly improved women's access to **microfinance and credit**.
 - SHGs have facilitated **income generation activities and entrepreneurship** among women and **increased income and economic stability** for many women and their families.
 - SHGs have played a **vital role in poverty alleviation** and financial inclusion by providing **access to affordable financial services, reduce reliance on high-cost informal loans**.
- **Women's Agency and Empowerment:**
 - SHGs offer **leadership and assertiveness training**, empowering women to challenge traditional gender norms and assume leadership roles in their communities.
- **Impact on Family and Society:**
 - SHGs have empowered women with **greater respect and decision-making power**, fostering more equitable family relationships.
 - SHGs also increased women's **representation and leadership roles** in local governance.
 - SHGs have mitigated social issues like **domestic violence** by economically empowering women and providing a supportive network.

What are the Challenges and Limitations Faced by the SHGs?

- **Sustainability of SHG Initiatives Beyond Initial Support:** The long-term viability of SHGs depends on continued external support and effective internal management which requires **strong leadership, community support**, and the ability to generate sufficient revenue to cover operational costs.
- **Issues of Dependency and Overreliance on External Aid:** SHGs face significant challenges due to their dependency on external aid, which can hinder their self-sustainability and long-term viability, especially in disaster-affected areas.
- **Addressing Intersectional Challenges:** SHGs often encounter caste, class, and regional challenges, impacting their effectiveness and inclusivity, with marginalised groups typically receiving fewer benefits.
- **Agricultural Activities:** Most SHGs operate at the local level, primarily engaged in agricultural activities. SHGs in rural areas should be introduced to non-agricultural businesses and provided with state-of-the-art machinery.
- **Lack of Technology:** Many SHGs use rudimentary or no technology in their operations.
- **Market Access:** Goods produced by SHGs often lack access to larger marketplaces.
- **Poor Infrastructure:** SHGs are typically located in rural and remote areas with poor connectivity via roads or railways and limited access to electricity.
- **Politicisation:** Political affiliation and interference are significant issues for SHGs, often leading to group conflicts.

Disenfranchisement of Undertrials in India

Why in News?

- As the 18th Lok Sabha **elections** are underway, more than four lakh **undertrials in prisons nationwide are unable to exercise their right to vote** due to a sweeping legal ban.
- The **Representation of the People Act, of 1951** prohibits voting for individuals confined in prison, regardless of whether they are convicted or awaiting trial.

Note:

Note:

- An undertrial is a person **who is currently on trial or who is imprisoned on remand whilst awaiting trial** or a person who is on trial in a court of law.
 - The **78th Report of Law Commission** also includes a person who is in judicial custody on remand during investigation in the definition of an 'undertrial'.
- Data from the **Crime in India 2022 report** reveals that approximately over 500,000 individuals, if not more, will be unable to exercise their voting rights in the ongoing 2024 Lok Sabha elections, by way of their confinement.
 - As per the **National Crime Records Bureau (NCRB)**, in 2022 there were 4,34,302 undertrials across jails in India, comprising 76% of the total jail population of 5,73,220.

Why are Undertrials Barred from Voting?

- **Section 62(5) of the Representation of the People Act:**
 - A person **confined in a prison, under a sentence of imprisonment or transportation, or in the lawful custody of the police**, shall not be allowed to vote at any election.
 - Despite being prohibited from voting, a person whose name is on the **electoral roll** will not cease to be an elector.
 - The prohibition to vote **does not apply to a person subjected to preventive detention under any current law.**
 - This provision has been upheld by the **Supreme Court**, which has cited reasons such as resource constraints and the need to keep persons with criminal backgrounds away from the election scene.
 - The Supreme Court recognises free and fair elections as part of the **'basic structure' of the Constitution** but distinguishes that the **right to vote (Article 326) is considered constitutional right** rather than **fundamental rights**, subject to regulations imposed by laws such as the **Representation of People Act, 1951**.

- Article 326 of the Indian Constitution provides for **adult suffrage. Every citizen over 18 has the right to vote unless disqualified** on the grounds of non-residence, unsoundness of mind, crime or corrupt practices.
- The right to be elected is considered a statutory right.

- **Bar Against Contesting Elections Only After Conviction:**
 - Section 8 of the RPA, 1951 **disqualifies a person from contesting elections only upon conviction for certain criminal offences, not merely upon being charged.**
 - The Supreme Court has rejected pleas to disqualify persons with criminal charges or those who file false affidavits, stating that only the legislature can alter the RPA, 1951.
 - Exceptions to disqualification:
 - The **Election Commission of India** can remove or reduce the period of disqualification under certain circumstances.
 - A disqualified MP or MLA can still contest if their conviction stays on appeal to a higher court.

Historical Background of Prisoner Disenfranchisement

- **English Forfeiture Act of 1870:** It disqualified individuals convicted of treason or felony.
 - The rationale behind this was that once someone was convicted of such serious offences, they **forfeited their rights, including the right to vote.**
- **Government of India Act of 1935:** Individuals serving sentences of transportation, penal servitude, or imprisonment were barred from voting.
 - However, the RPA, 1951 adopted a broader approach to defining such disenfranchisement. It specified that individuals confined in prison, serving sentences of imprisonment or life or otherwise **detained in lawful police custody, are ineligible to vote.** This provision excludes only those in preventive detention.

Should Undertrials Have the Right to Vote?**Arguments in Favour of Allowing Undertrials to Vote**

Presumption of innocence: Undertrials are presumed innocent until proven guilty. Denying them the right to vote may be viewed as punitive action before conviction.

Arguments Against Allowing Undertrials to Vote

Public safety concerns: Allowing undertrials to vote may raise concerns about voter intimidation or electoral interference, especially in cases involving serious crimes.

Note:

<p>The UN Human Rights Committee views denying voting rights solely based on custodial status as violating the presumption of innocence.</p> <p>The Supreme Court held debarring undertrials from voting amounts to punishing them twice.</p>	
<p>Representation and political participation: Allowing undertrials to vote ensures that their interests and perspectives are represented in the political process, including policies affecting prison conditions and the criminal justice system.</p>	<p>Logistical challenges: Facilitating voting for undertrials within prison environments may pose logistical and administrative challenges for election authorities, such as ensuring ballot secrecy and preventing coercion.</p>
<p>Prisoners have violated the social contract and willingly placed themselves outside the social order.</p>	<p>Social contract cannot be negotiated away.</p>
<p>Disenfranchisement concerns: Denying undertrials the right to vote could be seen as disenfranchisement, particularly for marginalised groups who may be disproportionately represented in pre-trial detention.</p>	<p>Temporary nature of detention: Undertrials are in a temporary state of detention, and their voting rights could potentially be restored upon acquittal or completion of their sentence.</p>
<p>Voting Right: Critics argue that denying undertrials the right to vote is discriminatory and violates the principle of equality (Article 14).</p> <p>The ban lacks reasonable classification based on the nature of the crime or duration of the sentence, unlike in countries such as South Africa, the United Kingdom, France, Germany, Greece, and Canada.</p> <p>Additionally, disallowing undertrials from voting creates a distinction between convicts on bail who can vote and undertrials who cannot, leading to illogical discrimination.</p>	<p>Punishment and deterrence: Some argue that the loss of certain rights, including voting, serves as a consequence of involvement in criminal proceedings and may act as a deterrent against criminal behaviour.</p>

Legal Precedents Regarding Right to Vote in India

- **Indira Gandhi v Raj Narain Case, 1975:** The Supreme Court recognised that free and fair elections are a part of the **'basic structure' of the Constitution of India**, and any laws or policies that would violate this principle could be struck down.
- **Praveen Kumar Chaudhary V. Election Commission and Ors Case:** The Delhi High Court opined that **voting right is neither a constitutional nor a fundamental right but only a statutory right.**
 - The court upheld the constitutional validity of Section 62 (5), reaffirming that **prisoners do not have the right to vote.**
- **People's Union of Civil Liberties (PUCL) vs Union of India Case, 2003:** The SC clarified that the **right to vote is a constitutional right** provided under Article 326 of the Indian Constitution. But the **right to vote is not enumerated as a fundamental right.**
 - **The right to make a choice by means of a ballot is indeed a part of the freedom of expression** under Article 19(1)(a) of the Constitution.
- **Anukul Chandra Pradhan, Advocate v. Union Of India & Ors Case, 1997:** The Court upheld the **constitutionality of Section 62(5) of the RPA**, which disenfranchises prisoners.
 - The Supreme Court **cited three main justifications:**
 - Prisoners forfeit certain freedoms due to their conduct.
 - Logistical challenges arise due to increased security needs for prisoners voting.
 - The intention to exclude individuals with criminal backgrounds from the electoral process.

Note:

Police as Last Resort in Marital Dispute

Why in News?

Recently, the **Supreme Court** of India has advised caution to families facing marital trouble, stating that going to the police should be the “last resort”.

What are the Observations of the Supreme Court?

- About:
 - A SC bench made some observations while ruling on a petition filed by the husband against the order of the **Punjab and Haryana High Court** which refused to quash criminal proceedings against him.
 - The Supreme Court **advises caution in using police intervention** only in “**very genuine cases of cruelty and harassment**”.
- Observations:
 - The judgement **cautions against the mechanical application of Section 498A** (domestic cruelty) of the **Indian Penal Code (IPC)**.
 - A “**complete**” **domestic violence** case requires elements like criminal intimidation or causing hurt beyond trivial irritations.
 - The **court urges Parliament to review Sections 85 and 86 (up to 3 years) imprisonment** of the **Bhartiya Nyaya Sanhita, 2023** (similar to Section 498A IPC).
 - Divorce is acknowledged as **detrimental to a child’s upbringing**, especially when initiated hastily due to criminal proceedings.
 - The judgement **encourages High Courts to carefully consider all aspects and circumstances** before deciding on pleas to quash criminal proceedings arising from marital issues.

Note:

- The **Madhya Pradesh High Court** ruled that unnatural sexual intercourse by a man with his wife will **not be considered “rape”** under **Section 377 of IPC** as **the consent of the wife in such a case becomes immaterial** because she was wedded to him.

- The court quashed an FIR registered by a wife against her husband, accusing him of having unnatural sex.
- Though **marital rape is not an offence** in IPC yet **Kerala High Court in 2021** ruled that **marital rape** amounts to cruelty by husband to wife and a **ground for divorce under the ambit of cruelty**.

What are the Other Existing Ways to Resolve Matrimonial Disputes?

- Various mechanisms under the **Alternative Dispute Resolution (ADR)** can help in resolution of the matrimonial disputes speedily:
 - **Mediation:** A neutral third party facilitates communication and negotiation between spouses to arrive at a mutually agreeable solution regarding matrimonial and family disputes.
 - The **Supreme Court** in the **K.Srinivas Rao vs D.A Deepa case** emphasised mediation in matrimonial disputes.
 - **Conciliation:** Similar to mediation, but the **conciliator may also propose solutions and guide the couple** towards an agreement.
 - **Arbitration:** Here, a **private arbitrator chosen by both parties** hears arguments and delivers a binding decision on the dispute.
- Also, various legal institutions provide for **Alternative Dispute Resolution (ADR)** as a **more effective way to deliver justice** due to the involvement of factors like emotions and social taboos in the marriage concept.
 - **Family Courts**, established by the **Family Courts Act, of 1984**, promote conciliation and **secure speedy settlement** of disputes relating to **marriage and family affairs and related matters**.
 - **Gram Nyayalayas**, established under the **Gram Nyayalayas Act, 2008** provides for speedy and easy access to the matrimonial disputes in the rural areas of India.
 - The **Code of Civil Procedure, 1908** and the **Hindu Marriage Act, 1955** also encourage reconciliation in family disputes.

Note:

Domestic Violence Against Women

Domestic violence refers to any form of abuse, whether physical, emotional, sexual, or economic, within the confines of the home, family or domestic unit.



National Family Health Survey-5 (NFHS), 2019-2021

- ↳ 29.3% of married women experienced domestic/sexual violence
- ↳ 3.1% of pregnant women suffered physical violence during pregnancy
- ↳ 87% of married women who are victims of marital violence do not seek help

Legal Frameworks in India

Protection of Women from Domestic Violence Act, 2005 (PWDVA)	<ul style="list-style-type: none"> ■ Covers physical, emotional, sexual, and economic abuse ■ Provides various orders for protection, residence, and relief
Indian Penal Code, 1860	<ul style="list-style-type: none"> ■ Section 498A deals with cruelty by a husband or his relatives ■ Criminalises acts of cruelty, harassment, or torture
Dowry Prohibition Act, 1961	<ul style="list-style-type: none"> ■ Makes giving or receiving dowry a crime
Criminal Law (Amendment) Act, 2013	<ul style="list-style-type: none"> ■ Section 354A amended the IPC to include new offenses related to sexual harassment in cases of domestic violence
National Commission for Women Act, 1990	<ul style="list-style-type: none"> ■ Safeguards women's rights and plays a key role in addressing domestic violence
The Prohibition of Child Marriage Act, 2006	<ul style="list-style-type: none"> ■ Prevent child marriages and prohibit domestic violence against child brides.

Global Initiatives

- ↳ **Convention on the Elimination of All Forms of Discrimination against Women (CEDAW):** Adopted in 1979 by the UN General Assembly
 - Eliminating discrimination against women in all areas of life
- ↳ **UN Declaration on the Elimination of Violence against Women (DEVAW):** First international instrument explicitly addressing violence against women
 - Provides a framework for national and international action
- ↳ **Safe Cities and Safe Public Spaces:** Flagship program by UN Women
 - Preventing and responding to sexual harassment and other forms of violence in public spaces
- ↳ **Beijing Platform for Action (1995):** Identifies specific actions for governments to take to prevent and respond to violence
- ↳ **SDG 5 (Gender Equality):** End all forms of discrimination against all women and girls everywhere



Drishti IAS

Note:

Digital Arrest Scams

Why in News?

The Ministry of Home Affairs (MHA) has issued a warning about an increase in 'digital arrest' scams, where **cybercriminals** impersonate government officials to extort money from unsuspecting victims.

The **Indian Cybercrime Coordination Centre (I4C)**, in collaboration with Microsoft, is actively combating this organised online economic crime.

What are Digital Arrest Scams?

- **Cybercriminal Impersonation:** Scammers pose as personnel from various government agencies, including the police, **Central Bureau of Investigation (CBI), Narcotics Department, Reserve Bank of India (RBI), or Enforcement Directorate.**
- **Intimidation Tactics:** Victims receive calls alleging their involvement in illegal activities, such as sending or receiving contraband items like drugs or fake passports.
 - Claims may also involve a loved one supposedly caught in criminal activities or accidents, with the fraudsters demanding money to resolve the 'case'.
- **Digital Confinement:** Some victims are subjected to 'digital arrest,' where they are forced to stay on video calls with the scammers until their demands are met.
- **Demands for Money:** Criminals are **extorting money in exchange** for agreeing not to expose the false legal cases that have been constructed.

What are the Steps Being Taken to Combat These Scams?

- **Blocking Fraudulent Accounts:** The I4C, has blocked over 1,000 Skype accounts linked to intimidation, blackmail, extortion, and "digital arrests" of citizens by cybercriminals posing as government personnel.
 - I4C is also facilitating the blocking of SIM cards, mobile devices, and mule accounts used by these fraudsters.
- **Cross-Border Crime Syndicates:** The MHA has identified that these scams are operated by cross-border crime syndicates, making them part of a larger, organised online economic crime network.
- **Alerts and Awareness:** I4C has issued various alerts regarding such frauds on its social media platform "**cyberdost,**" and other platforms.
 - If someone receives such a call, they should immediately report the incident on the **cybercrime helpline number** or the website "**National Cyber Crime Reporting Portal**" for assistance.

CYBER SECURITY

Cybersecurity refers to any technology, measure, or practice for preventing cyberattacks or mitigating their impact.

CYBER SECURITY ATTACKS

'Crime in India' Report 2022 (NCRB) highlighted 24.4% surge in cybercrimes in India since 2021.

Common Cybersecurity Myths

- ⊖ Strong passwords alone are adequate protection
- ⊖ Major cybersecurity risks are well-known
- ⊖ All cyberattack vectors are contained
- ⊖ Cybercriminals don't attack small businesses

Cyber Warfare

- ⊖ Digital attacks to disrupt vital computer systems, to inflict damage, death, and destruction.

Recent Major Cyber Attacks

- ⊖ WannaCry Ransomware Attack (2017)
- ⊖ Cambridge Analytica Data Breach (2018)
- ⊖ Financial data of 9M+ cardholders, including SBI, leaked (2022)

CYBER THREAT ACTORS

CYBER THREAT ACTOR	MOTIVATION
NATION-STATES	GEOPOLITICAL
CYBERCRIMINALS	PROFIT
HACKTIVISTS	IDEOLOGICAL
TERRORIST GROUPS	IDEOLOGICAL VIOLENCE
THRILL-SEEKERS	SATISFACTION
INSIDER THREATS	DISCONTENT

Types of Cybersecurity

- ⊖ Critical infrastructure security (Robust access controls)
- ⊖ Network security (Deploying firewalls)
- ⊖ Application security (Code reviews)
- ⊖ Cloud Security (Tokenization)
- ⊖ Information security (Data masking)

Regulations & Initiatives

- ⊖ **International:**
 - ⊕ UN Group of Governmental Experts (GGE) on Advancing Responsible State Behaviour in Cyberspace
 - ⊕ NATO's Cooperative Cyber Defense Centre of Excellence (CCDCOE)
 - ⊕ Budapest Convention on Cybercrime, 2001 (India not a signatory)
- ⊖ **India:**
 - ⊕ IT Act, 2000 (Sections 43, 66, 66B, 66C, 66D)
 - ⊕ National Cyber Security Policy, 2013
 - ⊕ National Cyber Security Strategy 2020
 - ⊕ Cyber Surakshit Bharat Initiative
 - ⊕ Indian Cyber Crime Coordination Centre (I4C)
 - ⊕ Computer Emergency Response Team-India (CERT-In)

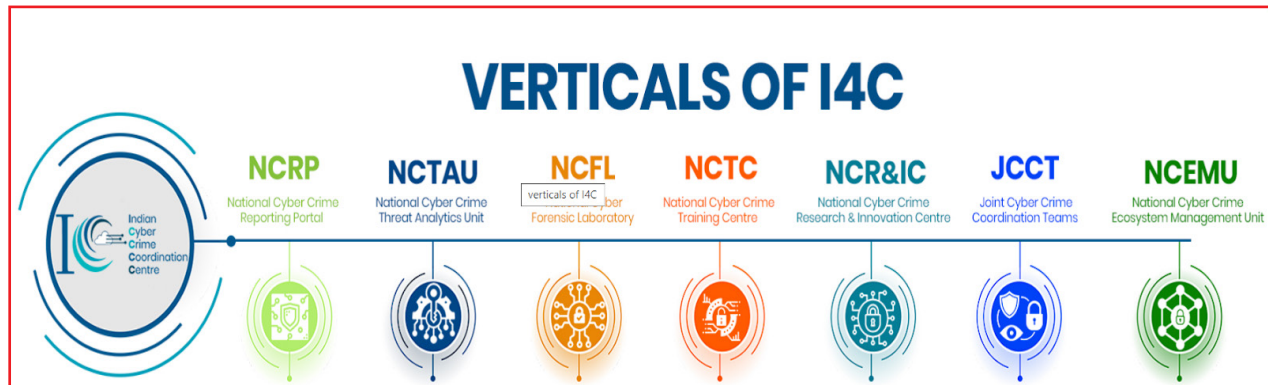
Steps Needed for Cyber Security

- ⊖ Network Security
- ⊖ Malware Protection
- ⊖ Incident Management
- ⊖ User Education and Awareness
- ⊖ Secure Configuration
- ⊖ Managing User Privileges
- ⊖ Information Risk Management Regime

Note:

Indian Cybercrime Coordination Centre (I4C)

- It was established by MHA, in New Delhi to provide a framework and eco-system for **Law Enforcement Agencies (LEAs) for dealing with Cybercrime** in a coordinated and comprehensive manner.
 - I4C is envisaged to act as the **nodal point to curb Cybercrime in the country**.
- It proposes **amendments to cyber laws to keep up with rapidly evolving technologies** and international cooperation.
- Coordinate implementation of **Mutual Legal Assistance Treaties (MLAT)** with other countries for cybercrimes in consultation with the relevant authority in MHA.
 - MLAT is a bilateral agreement between two or more countries that allows for the exchange of information and evidence to enforce criminal or public laws.



Read more: [India's Cybersecurity Challenge: Threats and Strategies](#)

SC Limits ED's Arrest Powers in PMLA Cases

Why in News?

Recently the **Supreme Court** ruled that the **Enforcement Directorate (ED)** loses the authority to arrest an accused once a **special court** takes cognisance of a **chargesheet** filed under the **Prevention of Money Laundering Act (PMLA)**.

- The judgement **limits the ED's power to execute arrests** and emphasises the inviolability of **personal liberty**.

What is the Recent Ruling of the Supreme Court Regarding PMLA?

- **Provisions in Question:** The judgement stemmed from an appeal against the ED, challenging a Punjab and Haryana High Court decision denying **anticipatory bail**.
 - The case examined whether an accused could apply for bail under the regular provisions of the **Code of Criminal Procedure (CrPC)**, and if so, whether such a bail plea would also have to satisfy the **twin conditions** under **Section 45** of the **PMLA**.

- The court also deliberated on whether an accused not arrested during the PMLA investigation would have to meet the **stringent PMLA bail conditions** if they **appear before the court** after being summoned or **having a warrant issued** for their failure to appear.

SC Observations:

- **Status of Accused Appearing on Summons:** If an accused appears before a designated special court pursuant to a summons, **they cannot be treated as being in custody**, and hence, they need not apply for bail under the stringent conditions posed by the PMLA.
 - The ED will have to separately apply for the custody of an accused after they appear in court, showing **specific grounds** necessitating custodial interrogation.
 - This presumption of liberty is a **crucial step** towards protecting the **fundamental right of personal liberty**.
- **Nature of Bonds/Sureties:** The special court can direct the accused to provide a **surety/guarantee (bonds)** as per Section 88 of the Code of Criminal Procedure.
 - However, this **surety is not the same as granting bail** and does not require satisfying the stringent twin conditions of Section 45 of the PMLA.

Note:

- **Graded Arrest Procedure:** If the accused fails to appear before the court despite being summoned, the special court can first issue a **bailable warrant (where bail can be obtained)**.
 - If the accused still does not appear, the court can then issue a non-bailable warrant (arrest without bail).
- **Arresting Non-Accused Parties:** The ED can still arrest an individual who is not named as an accused in the initial PMLA complaint.
 - However, to do so, the ED must follow the proper arrest procedures outlined in Section 19 of the PMLA.

What are the Twin Conditions of Bail Under PMLA?

Under Section 45 of the PMLA, the twin conditions are:

- **Burden of Proving Innocence:** It imposes **rigorous bail conditions**, requiring the **accused to prove their innocence**.
- **Ensuring No Offences While on Bail:** The accused should be able to convince the judge **he would not commit any offence** while on bail.
 - The **burden of proof is entirely on the incarcerated accused**.
 - These twin conditions make it almost impossible for an accused to get bail in the PMLA.
- **About:** The **Prevention of Money Laundering Act, 2002 (PMLA)** was enacted to prevent cases of **money laundering** and provide for the confiscation of property derived from money laundering.
 - It aims to **combat money laundering** related to illegal activities such as drug trafficking, smuggling, and **terrorism financing**.
- **Key Provisions of PMLA:**
 - **Offences and Penalties:** PMLA defines money laundering offences and imposes penalties for such activities. It includes **rigorous imprisonment** and fines for offenders.
 - Money laundering is the process of **converting illegally** earned money into seemingly legal money.
 - **Attachment and Confiscation of Property:** The Act allows for the **attachment and confiscation of property** involved in money laundering. It provides for the establishment of an **Adjudicating Authority** to oversee these proceedings.

- **Reporting Requirements:** PMLA mandates certain entities, such as **banks and financial institutions**, to maintain records of transactions and report suspicious transactions to the **Financial Intelligence Unit (FIU)**.
- **Appellate Tribunal: Section 25 of PMLA** provides for the establishment of an Appellate Tribunal, which is vested with power to hear appeals against orders passed by the Adjudicating Authority.
- **Recent Amendments Related to PMLA:**
 - Prevention of Money-laundering (Restoration of Confiscated Property) Amendment Rules, 2019:
 - **Insertion of New Rule 3A:** Under it, the Special Court may publish notice in newspapers calling for claimants with legitimate interest in attached/seized/frozen property to establish their claims for restoration, after framing of charges.
 - **Prevention of Money Laundering (Maintenance of Records) Amendment Rules, 2023:** The Finance Ministry has revised money laundering regulations to expand disclosure requirements for NGOs by reporting entities such as financial institutions, banks, or intermediaries.
 - It has also clarified the definition of **“politically exposed persons”** under the Prevention of Money Laundering Act (PMLA) to align with **Financial Action Task Force (FATF)** recommendations.
 - The new PMLA compliance rules define **“Politically Exposed Persons” (PEPs)** as individuals entrusted with prominent public functions by a foreign country, such as heads of state, senior politicians, and high-ranking government, judicial or military officers, senior executives of state-owned corporations and important political party officials.
- **Concerns Regarding PMLA, 2002:**
 - **Broad Definition of Proceeds of Crime:** Debates have arisen over the **broad interpretation of “proceeds of crime”** in the PMLA, with concerns about its potential to include **legal financial transactions**.
 - The law targets those involved in generating and laundering crime proceeds, holding even those with no direct involvement in the crime but who participate in the laundering process accountable.
 - **Coverage of Numerous Offences:** The PMLA includes numerous offences in its schedule unrelated to its original purpose of combating the laundering of drug money.

Note:

- The **UN resolution** that led to the enactment of the law in India only mentioned the offence of laundering drug money, which was considered a serious economic crime with the potential to destabilise the world economy and endanger national sovereignty.
- **Arrest of Person Without Written Communication of Grounds of Arrest:** Enforcement Directorate officers have consistently violated **Article 22(1)** of the Constitution and **Section 19(1) of the 2002**

PMLA by relying solely on verbal communication for arrest, which is considered inadequate.

- Recently, the Supreme Court ordered the release of NewsClick founder Prabir Purkayastha, ruling his arrest under the **Unlawful Activities Prevention Act (UAPA) invalid**, citing Article 22(1) of the Constitution which mandates that arrested individuals must be **promptly informed of the grounds for their arrest**.

What are Bailable and Non Bailable Offences in India?

Offence Type	Description	Example
Bailable	Less serious offences, where the accused is presumed innocent and entitled to release on bail.	Petty theft, Traffic violations, Simple assault
Non-Bailable	More serious offences, where the court has discretion to grant bail based on specific criteria.	Murder, Rape, Kidnapping, Arson

Spices Board of India

Why in News?

The Spices Board of India has taken up the issue of setting limits for using **Ethylene Oxide (ETO)** in spices with **CODEX**, the international food standards body.

- This comes after certain **branded spices** exported by Indian **companies to Hong Kong and Singapore** were recalled due to concerns related to ETO contamination, **followed by a ban by Nepal** on the sale and import of certain spice-mix products due to similar concerns.

What is the Spices Board of India?

➤ About:

- **Spices Board** was constituted on 26th February 1987 under the **Spices Board Act, 1986** with the merger of the erstwhile **Cardamom Board (1968)** and **Spices Export Promotion Council (1960)**.
- There are **five statutory Commodity Boards** under the Department of Commerce.
 - These Boards are responsible for **production, development and export** of **tea, coffee, rubber, spices and tobacco**.
- It is responsible for the **export promotion** of the **52 scheduled spices** and the **development of Cardamom**.
- Spices Board is the **flagship organisation** for the development and worldwide promotion of Indian spices.

- The Board is an **international link** between the Indian exporters and the importers abroad.

➤ Issue of Ethylene Oxide (ETO):

- **ETO** is a chemical used as a **sterilizing agent** in spices, but it is considered **carcinogenic** when used beyond certain limits.
 - While efforts are being made to prevent **ETO contamination**, the sample failure rate for Indian spice exports is **less than 1%** in major markets.
- As of now, CODEX has not established a limit, and there is also no standardized ETO testing protocol available.
 - India has taken up with the **CODEX committee** the need for setting up limits for ETO usage as different countries have different limits.
- The Spices Board released guidelines for exporters to prevent ETO contamination and ensure the safety of all markets.
 - It advises against using ETO as a sterilising agent for spices and suggests alternatives like **steam sterilisation and irradiation**.
- **Other countries** like the US, New Zealand, and Australia have also raised concerns about the **quality of some Indian spices** and are determining if further action is needed.

Note:

Note:

- India is the world's **largest spice producer**. It is also the largest consumer and exporter of spices.
- In 2023-24, India's spice exports reached USD 4.25 billion, capturing a 12% share share of global spice exports.

International Food Standards

- Since 1963, the Codex system has developed openly and inclusively to address new challenges.
- Codex standards are based on **sound science** provided by **independent international risk assessment bodies** or ad-hoc consultations organized by the **Food and Agriculture Organization's (FAO)** and the **World Health Organization (WHO)**.



SC Declines Plea Against Collegium System

Why in News?

Recently, two senior-most district judges moved to the Supreme Court alleging that the Himachal Pradesh HC collegium overlooked their merit and seniority in the selection process of judges, and have taken their grievances to the Supreme Court.


- The issue highlights concerns about the adherence to the Supreme Court-devised process for selecting High Court judges.
- Previously in April, the **Supreme Court** registry refused to accept a petition to end the **Collegium system** of judicial appointments and revive the **National Judicial Appointments Commission (NJAC)**.

What is a Collegium System and How Did It Evolve?

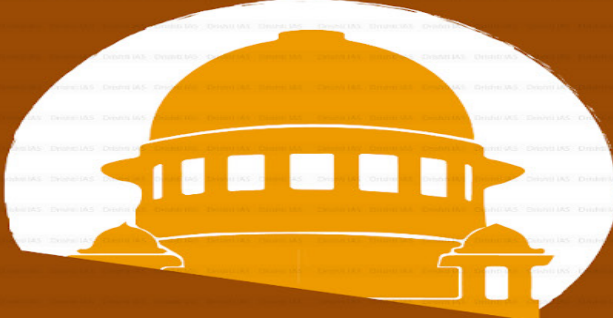
- **About:**
 - It is the **system of appointment and transfer of judges** that has evolved through judgments of the SC, and not by an Act of **Parliament** or by a provision of the Constitution.

Note:

- **Articles 124(2)** and **Article 217** of the Indian Constitution deal with the **appointment of judges** to the Supreme Court and High Courts.
- The Supreme Court has **already upheld the collegium system**, and **struck down NJAC** -which gave an equal role to the government in judicial appointments — by a Constitution Bench in 2015. A review plea against the judgement was also subsequently dismissed in 2018.



Collegium System



➤ System of appointment and transfer of judges
 ➤ Evolved through judgments of the Supreme Court, and not by an Act of Parliament

Constitutional Provisions Related to Appointment of Judges

- Articles **124 (2)** and **217**. Appointment of judges to the Supreme Court and High Courts
 - President makes appointments after consulting with "such judges of the Supreme Court and of the High Courts" as s/he may deem necessary.
- But the Constitution **does not lay down any process** for making these appointments.

Evolution of the System

First Judges Case (1981)

- SC held that in the appointment of a judge of the SC or the HC, the word "consultation" in Article **124 (2)** and in Article **217** of the Constitution does not mean "concurrence"
- Gave the **executive primacy** over the judiciary in judicial appointments



Second Judges Case (1993)

- SC overruled the First Judges Case
- Gave **birth to the Collegium System (Primacy to the Judiciary)**
- Collegium included the Chief Justice of India and the **2** most senior judges of the SC

Third Judges Case (1998)

- SC expanded the Collegium to include the CJI and the **4** most-senior judges of the court after the CJI

Current Structure



-  **Supreme Court Collegium:** CJI and the **4** senior-most judges of the SC
-  **High Court Collegium:** CJI and **2** senior most judges of the SC

Criticism

- Opaqueness
- Scope for Nepotism
- Exclusion of Executive
- No Predetermined Procedure of Appointment

National Judicial Appointments Commission (NJAC)

- It was an attempt to replace the Collegium System. It prescribed the procedure to be followed by the Commission to appoint judges
- NJAC was established by the **99th Constitutional Amendment Act, 2014**
- But the **NJAC Act was termed unconstitutional** and was struck down, citing it as having affected the independence of the judiciary

Note:

Collegium System According to Third Judges Case (1998):

Appointment of Supreme Court Judge	Appointment of High Court Judge	Transfer of High Court Judge
4 senior-most judges of the Supreme Court.	2 senior-most judges of the Supreme Court	4 senior-most judges of the Supreme Court along with the judges of the two High Courts in concern.

What are the Issues Related to the Collegium System?

- **Exclusion of Executive:**
 - The complete exclusion of the **executive** from the judicial appointment process created a system where a few judges appoint the rest in **complete secrecy**.
 - Also, they are **not accountable to any administrative body** that may lead to the wrong choice of the candidate while overlooking the right candidate.
- **Chances of Favouritism and Nepotism:**
 - The collegium system **does not provide any specific criteria** for testing the candidate for the post of **CJI** because of which it leads to wide scope for **nepotism and favouritism**.
 - For instance, as per the two senior-most district judges, the Himachal Pradesh HC collegium had ignored the SC collegium's advice in the selection process of judicial officers much junior to them, **bypassing their merit, seniority, and "unblemished judicial track record."**
 - Allegedly, the collegium system gives rise to **non-transparency** of the judicial appointments, which is very harmful for the regulation of law and order in the country.
- **Against the Principle of Checks and Balances:**
 - The principle of check and balance is violated in this system. In India, **three organs work partially independently** but they **keep check and balance** and control the excessive powers of any organ.

- However, the collegium system gives **the Judiciary immense power**, which leaves little room for checks and poses the risk of misuse.

➤ **Close-Door Mechanism:**

- Critics have pointed out that this system does not involve any official secretariat. It is seen as a **closed-door affair** with no public knowledge of how and when a collegium meets, and how it takes its decisions.
- Also, there are **no official minutes of collegium proceedings**.

➤ **Unequal Representation:**

- The other area of concern is the **composition of the higher judiciary**, women are fairly underrepresented in the higher judiciary.

Tea Board of India

Why in News?

Recently, a tea growers and manufacturers association reported that tea production in Assam and West Bengal may decrease by 50% in the coming months due to inadequate and uneven rainfall.

- Data from the **Tea Board of India** shows a projected 40% decrease in Assam and 23% decrease in West Bengal production until March 2024.

What is the Tea Board of India?

➤ **About:**

- The **Tea Board India** was established in **1903** through the **Indian Tea Cess Bill**, which **imposed a tax on tea** exports to fund the promotion of Indian tea domestically and internationally.
- The present Tea Board was set up under section 4 of the **Tea Act 1953** and was constituted on **1st April 1954**.
- It has succeeded the **Central Tea Board** and the **Indian Tea Licencing Committee** which functioned respectively under the **Central Tea Board Act, 1949** and the **Indian Tea Control Act, 1938** which were repealed.

➤ **Organisation of the Board:**

- The present Tea Board is functioning as a **statutory body** of the Central Government under the **Ministry of Commerce**.

Note:



- The Board is composed of **31 members** (including the Chairman) drawn from **Members of Parliament**, tea producers, tea traders, tea brokers, consumers, and representatives of Governments from the principal tea-producing states, and trade unions.
- The Board is reconstituted **every three years**.

➤ Functions:

- Rendering **financial and technical assistance** for the cultivation, manufacture and marketing of tea.
- Aiding **Research and Development** activities for augmentation of tea production and improvement of tea quality.
- With **Head Office located in Kolkata**, West Bengal it has twenty-three offices which include Zonal, Regional and Sub-Regional Offices.

Key Facts About Tea:

➤ Growth Conditions:

- **Climate:** Tea is a **tropical and sub-tropical plant** and grows well in **hot and humid climates**.
- **Temperature:** The ideal temperature for its growth is **20°-30°C** and temperatures above 35°C and below 10°C are harmful for the bush.
- **Rainfall:** It requires 150-300 cm annual rainfall which should be well distributed throughout the year.
- **Soil:** The most suitable soil for tea cultivation is **slightly acidic soil** (without calcium) with porous sub-soil which **permits a free percolation of water**.

➤ Tea is the **second most consumed beverage** in the world after water.

- India was the **second-largest producer** of tea after China, and the **largest consumer of said beverage**, using nearly 30% of the world's tea output.

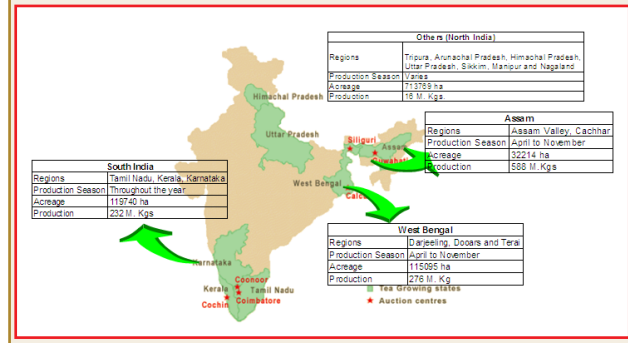
➤ Benefits:

- **Antioxidants** in tea help prevent oxidative damage to the body and act as **reactive oxygen species (ROS)** to repair damages caused by **free radicals**. They also enhance immune defense, lowering the risk of cancer and infection.

➤ Concerns:

- However, **recent ICMR guidelines** advise against excessive consumption of caffeine in tea and coffee as it can stimulate the body's **central nervous system** and lead to **physiological dependence**.

- The report stated that **beverages like tea can bind dietary iron** and make it unavailable, due to **tannins in caffeinated beverages** hindering iron absorption in the body.
- This can lead to **iron deficiency** and conditions like **anaemia**.



Smart Cities Mission

Why in News?

Despite **two extensions** until June 2024, the **Smart Cities Mission (SCM)** launched in 2015, is **unlikely to meet its deadline**, with 5,533 completed projects funded at Rs. 65,063 crore and 921 ongoing projects worth Rs. 21,000 crore.

What is the Smart Cities Mission (SCM)?

➤ About:

- It is a **Centrally Sponsored Scheme**, launched in June 2015 to transform **100 cities** to provide the necessary **core infrastructure** and clean and **sustainable environment** to enable a decent quality of life to their citizens through the application of **“Smart Solutions”**.
- It aimed to improve the quality of life for citizens through **sustainable and inclusive development**.

➤ Objectives:

- Provide core infrastructure and decent quality of life
- Clean and sustainable environment
- Application of ‘Smart’ Solutions
- Sustainable and inclusive development
- Compact areas
- Replicable model

➤ Components of the SCM:

○ Area-based Development:

- **Redevelopment:** Renewal of existing urban areas to improve infrastructure and amenities. E.g. Bhandi Bazar, Mumbai.

Note:

- **Retrofitting:** Upgrading infrastructure in existing areas to make them more efficient and sustainable. E.g. **Local Area Development (Ahmedabad).**
- **Greenfield Projects:** Development of new urban areas with a focus on sustainability and smart technologies. E.g. **New Town, Kolkotta, Naya Raipur, GIFT City.**

○ Pan-City Solutions:

- Implementation of **Information and Communication Technology (ICT)** solutions across various sectors such as **e-governance**, waste management, water management, energy management, urban mobility, and skill development.

➤ Governance Structure:

- To enhance effectiveness, a new governance model was adopted.
- A **Special Purpose Vehicle (SPV)** was created under the **Companies Act, 2013** led by a bureaucrat or a representative of a multinational corporation (MNC),

➤ Current Status of the Smart Cities Mission (SCM):

- Initially planned for completion by 2020, the mission was **extended twice**, with the current deadline set for June 2024.
- The funding Pattern was envisioned through Public-Private Partnership (PPP) Route.

➤ Government Initiatives

- **Atal Mission for Urban Rejuvenation and Urban Transformation (AMRUT)**
- **Pradhan Mantri Awas Yojana-Urban (PMAY-U)**
- **Climate Smart Cities Assessment Framework 2.0.**
- **TULIP-The Urban Learning Internship Program.**
- **Smart Cities Mission (SCM):** Launched in June 2015, aimed to adapt to global changes by selecting 100 cities for smart city development over five years.



What is a Smart City?

- The term '**Smart City**' gained prominence after the 2009 financial crash, referring to cities designed with advanced ICT integration, often **likened to new Silicon Valleys**.
- However in the Indian context, a Smart City would be the one which plans judiciously to meet its aspirations and challenges in a sustainable manner while fostering **principles of good governance**.
- **A Smart City is one which has** basic infrastructure, uses 'smart' solutions to make infrastructure and services better, and relies on Area-based development.
- **Evolution of Smart Cities:** Before 2009, cities were mainly seen as hubs of commerce and culture with little emphasis on integrating ICT however after 2009, there was a **marked shift toward leveraging ICT** for enhanced **efficiency, sustainability, and economic growth**, partly driven by post-financial crash recovery needs.

Note:



What are the Challenges Faced by the Smart City Mission?

- **Lack of Clarity in Definition:**
 - The SCM **did not clearly define a smart city**, acknowledging the varied conceptualisations based on local contexts and aspirations.
 - The definition's ambiguity makes it challenging to allocate resources effectively and prioritise projects.
 - **Top Down Approach:**
 - The role of elected representatives being sidelined by **reducing the role of elected councils** in decision-making raises concerns about **democratic governance and accountability**.
 - **Flawed City Selection Process:**
 - Selecting cities on a **competitive basis** overlooked the **diverse urban realities** of India, which are dynamic and not static like the West.
 - The scheme focused on **developing less than 1% of a city's area**, leading to exclusion of many areas from development.
 - For example, **Chandigarh** had invested Rs 196 crore into one pocket-sector 43.
 - **Inadequate Funding and Scope:**
 - **McKinsey reports** indicate that to improve livability in Indian cities by 2030, USD 1.2 trillion is needed, making Rs. 1,67,875 crore over nine years a mere 0.027% of the total urban India expenditure.
- Initially planned for completion by 2020, the mission was **extended twice**, with the current deadline set for June 2024, indicating the complexity of the urban development process.
- **Governance Structure Issues:**
 - The **Special Purpose Vehicle (SPV) model** created for smart cities was not aligned with the **74th Constitutional Amendment Act**, leading to objections from cities regarding the governance structure as it bypassed traditional city governance structures.
 - Despite **PPP** being an important driver of the mission, **not more than 5%** of the funding has come through this route.
 - **Displacement and Social Impact:**
 - Smart city projects led to the **displacement of people** living in poorer localities, such as street vendors, disrupting urban communities.
 - The focus on infrastructure development in some towns led to **enhanced urban flooding**, as water channels and contours were disrupted or dismantled.



Note:

Economic Scenario

Highlights

- India in Trade Deficit with Top Trading Partners
- Farm Loan Waivers in India
- Competition in Digital Markets
- Reforming India's Informal Labour Market
- India's Service Sector
- Political and Economic Reforms in 1991
- Rising Debt Strained Household Savings
- India's Critical Mineral Acquisition Plans in Africa
- Need for New Agriculture Export-Import Policy
- US Federal Reserve Keeps Rates Steady as Inflation Persists
- RBI Surplus Transfer to Government
- Consumption Comparison of India-China
- Indian Manufacturing Needs Product Sophistication
- Regional Economic Outlook for Asia And Pacific Report: IMF
- India's Target of USD 1 Trillion Goods Exports by 2030
- Global Trade Update: UNCTAD
- India's E-commerce Market
- Employment Trends in India
- Factors Shaping Global Gold Prices

India in Trade Deficit with Top Trading Partners

Why in News?

Recent official data shows that India has a **trade deficit** with **9 out of its top 10 trading partners**, including China, Russia, Singapore, and South Korea in 2023-24.

- A trade deficit occurs when the **value of a country's imports exceeds the value of its exports**, with imports and exports referring both to physical goods and services.

What is the Current Status of India's Trade Deficit?

- **India's total trade deficit in the last fiscal narrowed** to USD 238.3 billion as against USD 264.9 billion in FY 2-23-24.
 - Trade deficit with **China**, Russia, S Korea, and Hong Kong increased in the last fiscal compared to 2022-23, while the trade gap with the UAE, Saudi Arabia, Russia, Indonesia, and Iraq narrowed.
- China has emerged as India's largest trading partner with \$118.4 billion of two-way commerce in 2023-24, surpassing the US.
 - However, the US was the top trading partner of India during 2021-22 and 2022-23.
- India had a trade surplus of \$36.74 billion with the US in 2023-24, and also with the UK, Belgium, Italy, France, and Bangladesh.

- India has a **free trade agreement** with four of its top trading partners - Singapore, the UAE, Korea and Indonesia (as part of the Asian bloc).

What are the Reasons Behind India's Trade Deficit?

- **Reliance on Energy Imports:**
 - India imports more than 85% of its crude oil needs which makes the Indian economy **vulnerable to the fluctuations** in global oil prices, significantly impacting the trade deficit.
- **Dependence on Key Inputs:**
 - Some Indian industries, like **pharmaceuticals, semiconductors** etc. heavily rely on imported raw materials and intermediates. This increases the import value and contributes to the deficit.
 - For instance, the pharmaceutical sector heavily imports **Active Pharmaceutical Ingredients (APIs)** from China.
- **Lower Exports of Manufactured Goods:**
 - The volume of exported manufactured goods from India, often **falls short of imports** due to factors like **lower manufacturing capabilities** and **lower competitiveness** in the global market compared to nations like China and the US.

What are the Key Impacts of the Trade Deficit on the Indian Economy?

- **Benefits:**
 - A trade deficit is **not essentially bad** if a country is importing raw materials or intermediary products as it would **boost manufacturing and exports**.

Note:

- A short term benefit of the trade deficit is that higher imports ensure **availability of a wider variety of goods and services** to citizens which offer greater choices and further improve living standards.
- The trade deficit also results in **currency depreciation** resulting in benefits like **preference of Indian exports** due to more competitive prices.
- In some cases, a trade deficit can encourage domestic businesses to **invest in innovation and improve efficiency to compete with imported goods**. This can lead to **job creation in export-oriented sectors** like packaging, shipping, logistics etc.
- **Challenges:**
 - Over-reliance on imports **can stifle domestic innovation and production** in certain sectors, limiting the availability of domestically produced goods.
 - A large trade deficit, particularly in **sectors with significant import penetration**, can lead to **job losses** in the industries related to that particular sector.
 - For example, the **imports of textiles products** from Bangladesh, at cheaper rates, have caused some industries to shut off, resulting in job losses.
 - A persistent trade deficit can put downward pressure on the rupee's value, potentially **weakening the domestic currency**. This can make **imports even more expensive**.
 - Lower exports can lead to **decreased government revenue from export duties**. This can **impact the government's ability** to fund social programs and infrastructure development.
 - To finance a trade deficit, India might need to borrow from foreign sources, **increasing external debt and interest payments**.
 - This further depletes forex reserves, and signals economic instability to investors, leading to reduced foreign investment.
- **Example:** The **India-UAE CEPA** aims to reduce tariffs on over 80% of bilateral trade, **potentially boosting exports** of Indian textiles, pharmaceuticals, and agricultural products.
- **Improving Export Infrastructure:** Investing in infrastructure development, such as **modernising ports, roads, and logistics networks** can streamline the export process and reduce transportation costs.
- **Import Substitution:** The government shall encourage the use of **domestic substitutes for imported products** through **public procurement policies** and campaigns promoting locally made goods.
 - **Example:** Promoting the **use of domestically produced steel in government infrastructure projects** can reduce reliance on imported steel and boost the domestic steel industry.
- **Rationalise Imports:** Analysing import data can help identify **non-essential or luxury goods** that could be substituted with domestically produced alternatives.
 - **Example:** The government should discourage the import of certain electronic items through **higher tariffs**, encouraging consumers to choose domestically produced options.
- **Skilling the Workforce:** Investing in skill development programs can create a workforce with the expertise needed for modern industries, enhancing domestic production capabilities and reducing reliance on imports.
- **Managing Currency and Debt Levels Effectively:** The **RBI** should manage the rupee's exchange rate effectively, aiming for a balance that promotes exports without causing excessive depreciation.
 - The government should focus on **fiscal consolidation** to reduce its debt burden, creating a more stable economic environment for domestic industries to flourish.

What Measures can be taken to Control the Trade Deficit?

- **Trade Agreements:** Negotiating and implementing FTAs with key partners **can reduce tariffs** and other barriers to Indian exports, making them more competitive in foreign markets.

Farm Loan Waivers in India

Why in News?

- **Farm loan waivers** have become a staple promise in **Indian elections**, particularly in agricultural states.
- These debt relief schemes, though providing temporary respite, fail to address the **root causes of agrarian distress**.

Note:

What are Farm Loan Waivers?

- **About:** Farm loan waivers are **financial relief measures** implemented by governments, where certain agricultural loans are forgiven, relieving farmers from the burden of repayment to reduce the distress among farmers.
 - These waivers are often announced during election campaigns as promises to garner support from the farming community.
 - Farm loan waivers involve the **government absorbing the outstanding debt of farmers by providing a budgetary allocation to banks and financial institutions.**
 - Farmers face numerous challenges, including disputed land holdings, depleted groundwater reserves, poor soil quality, rising input costs, and low crop productivity.
 - Due to a lack of assured remuneration for their produce, farmers often borrow funds from banks or private lenders at high-interest rates.
 - **Loan waivers provide temporary relief to indebted farmers,** but they are not a long-term solution to agrarian distress.
- **Implementation of Waivers:**
 - In times of crop failure or natural calamities, governments may waive penal interest, reschedule loans, or completely waive off outstanding loans.
 - **The government's budget absorbs the financial liability, not the banks.**
 - The waivers can be selective, based on factors like **loan type (short-term, medium-term, long-term), categories of farmers, or loan sources.**

Farm Loans: Scheduled banks offer loans to individual farmers or groups of farmers for agricultural or allied activities such as **dairy, fishery, animal husbandry, poultry, bee-keeping and sericulture.**

- Short-term (up to 18 months) loans are offered for raising crops during two seasons – Kharif and Rabi, while medium (more than 18 months up to 5 years) and long-term (beyond 5 years) loans are offered for purchasing agricultural machinery, irrigation and other developmental activities.
- Loans are also available for **pre-harvest and post-harvest activities** such as weeding, harvesting, sorting, and transporting farm produce.

- **Most loans have a repayment period** in installments up to five years, and interest rates vary depending on the nature of loans and the issuing banks.

Historical Instances of Farm Loan Waivers

- The first pan-India farm loan waiver was introduced in the 1990-91 through the **Agricultural and Rural Debt Relief Scheme (ARDRS)** providing relief to farmers for up to Rs 10,000 on select loans.
- The second major waiver was the **Agricultural Debt Waiver and Debt Relief Scheme (ADWDRS)** announced in 2008.
 - The government allocated Rs 60,000 crores for farmer relief. **Small farmers with less than 2 hectares of land had their entire eligible amount waived off.**
 - Other farmers with more than 2 hectares of land were offered a one-time settlement (OTS) of 25% of the eligible amount as a rebate, if they pay the remaining 75%.
- According to a study by **State Bank of India (SBI)**, since 2014, various state governments, including Andhra Pradesh, Telangana, Uttar Pradesh, Maharashtra, Karnataka, Punjab, Madhya Pradesh, Chhattisgarh, Jharkhand, and Tamil Nadu, have announced loan waivers amounting to **Rs 2.52 lakh crores.**

Status of Various Farm Loan Waivers				
	Year of Loan Waiver	Amount of Loan Waiver (Rs crore)	Eligible Farmers (in lakh)	% of Farmers Loan Waiver Received (till Mar'22)
Uttar Pradesh	2017	36,000	39	52%
Maharashtra	2017	34,000	67	68%
	2020	45,000	44	91%
Andhra Pradesh	2014	24,000	42	92%
Karnataka	2018	44,000	50	38%
Punjab	2018	10,000	8	24%
Madhya Pradesh	2018	36,500	48	12%
Chhattisgarh	2018	6,100	9	100%
Telangana	2014	17,000	51	5%
Jharkhand	2020	-	9	13%
Total (10 instances)	-	2,52,600	368	51%

Source: SBI Research

Farm loan waivers between 2014 and 2022

How Do Farm Loan Waivers Affect Farmers and Governments?

- **Effects on Farmers:**
 - Waivers provide **short-term relief to farmers** struggling with debt, especially in the wake of poor harvests due to natural calamities.
 - Critics argue that **wavers can lead to a culture of non-repayment,** expecting future waivers, which can undermine the credit discipline among the farming community.

Note:

- Post-waiver periods often see a tightening of credit as banks become wary of lending, potentially affecting the farmers' ability to invest in the next crop cycle.
- A report by the **Comptroller and Auditor General (CAG)** found that the 2008 scheme benefitted **several ineligible farmers** while **leaving out many deserving small and marginal farmers**.
- **Implementation Challenges:** A recent SBI study in 2022 revealed that only **half of the beneficiaries of the nine farm loan waivers** announced by State governments since 2014 have **actually received write-offs**.
 - **Maharashtra** had a relatively high implementation rate. In contrast, **Telangana had the poorest implementation**.
- **Effects on Governments:**
 - Negative Impacts:
 - The most immediate impact is the **strain on government finances**. Waiving loans means forgoing a significant amount of revenue that could be used for other social programs or infrastructure development.
- According to a **NABARD report**, the 1990 ARDR scheme cost the Central government Rs 7825 crores. States were forced to take additional loans from the **RBI to cover their share of the loan waivers**.
 - Large-scale loan waivers can increase government borrowing, leading to **higher interest rates and inflation**, undermining economic stability.
 - Additionally, waivers often fail to tackle core agricultural issues like **low crop prices and inadequate infrastructure, offering only short-term relief**.
- **Positive Impacts:**
 - Farm loan waivers can **redirect funds from debt repayment to other areas**. This allows farmers to reinvest in agriculture by purchasing better inputs to increase productivity, and diversify into other agricultural activities like poultry, dairy, or horticulture to generate additional income.
 - Governments that implement loan waivers can gain political capital among the large farming population. A NABARD study from 1987 to 2020 found that **out of 21 State governments that announced waivers before State polls, only four lost**.

What are the Alternatives to Farm Loan Waivers?

- **Increased Public Investment in Agriculture:** Allocate a higher share of budgetary resources towards agricultural development as a proportion of **total expenditure or GDP**, which has been falling each year. Focus on **irrigation, electricity, storage, and transportation**.
 - Ensure easy access to **quality, affordable agricultural inputs like seeds, fertilizers, and pesticides**. Strengthen the supply chain and distribution for these inputs.
 - Enhance investment in agricultural research to develop **drought-resistant and high-yielding crop varieties**, improve farming techniques, and promote sustainable agriculture.
 - Strengthen and expand agricultural **extension services to disseminate modern farming practices, new technologies, and research findings to farmers, especially in remote areas**.
- **Incentivize Crop Diversification:** Farmers focus mainly on crops like wheat and rice due to government **minimum support prices (MSPs)** and procurement assurance.
 - Expanding price support and procurement to **include oilseeds, pulses, fruits, and vegetables will incentivize crop diversification**.
 - Implementing supportive policies and promoting water-efficient crops suited to local conditions will enhance sustainability.
 - **For example:** Punjab is facing **severe depletion of groundwater reserves and soil degradation** due to overuse of urea. The State's farmers primarily **grow wheat and rice**, as these are the only viable crops due to government procurement.
- **Direct Income Support Schemes:** Implement direct income support schemes like **PM-KISAN** and **Kisan Credit Card scheme** as alternatives to loan waivers, ensuring efficient fund disbursement via **direct benefit transfers (DBT) and Aadhaar-based identification**.
- **Market Reforms and Access:** Improving the functioning of **Agricultural Produce Marketing Committees (APMCs)** can reduce exploitation by middlemen and ensure farmers get a fair share of the consumer rupee.
 - Encouraging wider adoption of the **Electronic National Agriculture Market (e-NAM) platform** can facilitate online trading and connect farmers directly to consumers, eliminating unnecessary intermediaries.

Note:

- **Farmer Producer Organizations (FPOs):** Farmers forming cooperative societies can benefit from **bulk buying seeds, fertilisers, and equipment, reducing costs and getting better deals.**
 - They can also collaborate on marketing and selling their produce to fetch fairer prices.
- **Risk Mitigation Strategies:** Offering affordable and accessible **crop insurance schemes** can protect farmers from financial losses due to natural calamities or **unforeseen events.**
 - Crop insurance based on weather parameters helps mitigate risks from unpredictable weather patterns.

Competition in Digital Markets

Why in News?

Recently, at the 15th annual day celebrations of the Competition **Commission of India (CCI)**, the Chairperson stressed upon the tendencies of digital markets towards market concentration leading to monopolistic tendencies.

What were the Key Highlights of the Event?

- According to the CCI Chairperson, the control of **digital platforms over large datasets** can create barriers to entry for new players, compromise **platform neutrality, and lead to algorithmic collusion.**
- **Attorney-General for India** also highlighted that the **monopoly of e-commerce platforms** over user data “**can be an area for scrutiny**” and the need for new ideas to balance the free market and social benefit, requiring legal innovation.
- For the future, the digital economy offers immense opportunities for innovation, growth, and consumer benefit but has **challenged traditional competition law frameworks** worldwide..
- In the context of digital markets, the **importance of tools like behavioural economics** to understand human preferences was also highlighted.

What is a Digital Market?

- **About:**
 - Digital markets, also called online markets, are essentially any commercial space where **businesses and consumers connect through digital technologies.**

- **Examples:**
 - **E-commerce Marketplaces:** These are online platforms where businesses **sell products directly to consumers (B2C)**, like Amazon and eBay.
 - **Digital Advertising:** This involves **online ads** displayed on websites, social media platforms, or search engines. Companies like Google Ads and Facebook Ads operate in this space.
 - **Social Media Marketing:** Businesses utilise **social media platforms** like **Facebook, Instagram, or Twitter** to connect with potential customers, build brand awareness, and promote products or services.
 - **Search Engine Optimization (SEO):** This involves **optimising a website’s content and structure to rank higher** in search engine results pages (SERPs), increasing organic traffic.
- **Characteristics Leading to Monopolistic Tendencies:**
 - Many digital markets exhibit certain characteristics, such as **low variable costs, high fixed costs and strong network effects**, that result in **high market shares** for a small number of firms.

What are the Challenges Associated with the Competition in Digital Markets?

- **Market Dominance and Anti-Competitive Practices:**
 - A few powerful players can control a large share of the market, stifle innovation, and limit consumer choice. This dominance can lead to **anti-competitive practices** like:
 - **Self-preferencing:** A platform **prioritises its own products or services** over competitors in search results or promotions.
- **Example: Google allegedly favouring its own shopping results over other platform.**
 - **Tying and Bundling:** Forcing users to **purchase unwanted products** or services alongside desired ones.
- **Example: iPhones** offer a smooth user experience when paired with other Apple products like iPods and Apple Music. This **tight integration** forces the users to **stay within the Apple ecosystem**, potentially limiting their options with other brands.
 - **Exclusive Deals:** Locking suppliers or distributors into exclusive agreements, **hindering competition.**
- **Example:** A streaming platform like Hotstar, Jio Cinema etc securing **exclusive rights to shows, limiting viewer options.**

Note:

- **Network Effects and Winner-Take-All Dynamics:**
 - The value of a platform increases as more users join, creating a **snowball effect** that makes it **difficult for new entrants** to compete.
 - For **example**: Social media platforms like WhatsApp, Instagram etc. become more valuable with more users. This can lead to:
 - **High Switching Costs**: Users become addicted due to **accumulated data, network connections, or sunk costs**, making it hard to switch to a competing platform.
 - **Reduced Innovation**: Dominant players may have less incentive to innovate as they hold a strong market position.
- **Data Advantage and Privacy Concerns:**
 - Digital companies collect **vast amounts of user data**, giving them an advantage in **personalisation, targeted advertising, and product development**. This raises concerns about:
 - **Consumer Privacy**: The method through which **user data is collected**, stored, and used can be opaque, leading to privacy violations.
 - **Unequal Playing Field**: New entrants may struggle to compete with established players **who have a rich data set to leverage**.
- **Regulatory Challenges:**
 - The fast-paced nature of digital markets can make existing regulations ineffective. Regulators struggle to define and address:
 - **Antitrust Issues**: Defining and proving **anti-competitive behaviour** in complex digital ecosystems can be difficult.
 - **Determining a dominant firm** is also a substantial challenge.

What are Possible Solutions to Monitor the Digital Markets Competition?

- **Proactive Measures:**
 - **Designation of Systemically Important Digital Intermediaries (SIDIs)**: Identification of dominant players with **significant market power** (based on user base, and revenue) and subject them to **stricter regulations**.
 - **Prohibition of Anti-Competitive Practices**: Explicitly **banning practices** like self-preferencing and exclusive dealing that stifle competition.

- **Example**: A platform can't prioritise its own **products over competitors** in search results.
- **Data Sharing and Interoperability**: Mandating **data sharing or platform interoperability** to some particular extent to allow users to move data or services between platforms more easily.
 - **Example**: Allowing users to transfer their online shopping cart from one platform to another.
- **Strengthening the Competition Commission of India (CCI):**
 - **Enhanced Resources and Expertise**: Providing the CCI with **additional powers, resources and personnel** to effectively monitor digital markets and investigate potential anti-competitive practices.
 - **Example**: The **53rd Parliamentary Standing Committee Report** recommended strengthening the CCI to address competition concerns in digital markets.
- **Promoting Innovation with Data Protection:**
 - **Regulatory Sandbox**: A **regulatory framework for startups** in digital markets should be established **to test innovative products and services** in a controlled environment with reduced regulatory burdens.
 - **Transparency and User Choice**: Detailed regulations requiring platforms to be transparent about data collection practices and providing users with meaningful control over their data should be framed.
 - **Example**: The **Personal Data Protection Bill, 2023** aims to empower users with greater control over their personal data.

Reforming India's Informal Labour Market

Why in News?

- India's labour market** is characterised by a vast informal sector, with over **400 million workers** operating outside the formal employment structure.
- The informal workforce contributes to over half of the country's GDP. However, the prevalence of **lower-income and semi-skilled workers** highlights the urgent necessity for a structural shift towards formalisation and equitable opportunities.

Note:

Note:

- **Labour Supply:** It refers to the number of persons willing to work at different wage rates. It depends upon the existing wage rate and is measured in terms of **man-days**.
- **Labour Force:** It refers to the number of persons actually **working or willing to work**.
 - It does not depend upon the wage rate and is measured in terms of **number of days**.
- **Workforce:** It refers to the number of **persons actually working**.
 - This measure does **not include those persons who are willing to work but are not getting work**.

What is the Difference Between Formal and Informal Labour Market?

Aspect	Formal Labour Market	Informal Labour Market
Definition	Organised sector with Legal Recognition and Regulation	Unorganised sector lacking Formal Recognition and Regulation with minimal adherence to Labour Laws
Employment Type	Fixed Working Hours, Permanent, Contractual Agreements, or Temporary jobs. (Also includes Part-time Work and Self-Employment)	Casual, Domestic Workers, Daily-wage, Part-time Workers or Self-employment.
Job Security	Generally higher job security due to labour laws.	Lower job security; vulnerable to layoffs.
Wages and Benefits	Fixed wages, benefits (e.g., provident fund, insurance)	Variable wages, limited benefits.
Social Security	Eligible for social security schemes (e.g., pensions)	Limited access to social security programs.
Work Conditions	Better working conditions (e.g., safety standards).	Often poor working conditions (e.g., lack of safety measures)
Trade Unions	Active trade unions and collective bargaining.	Limited unionisation and weaker bargaining power.
Sector Examples	Manufacturing, IT, finance, government jobs.	Street vendors, domestic workers, agriculture.

What is the Current State of the Labour Market?➤ **Global State of Informal Economy:**

- Over **60% of the global workforce and 80% of enterprises** worldwide function in the informal economy.
- More than **2 billion workers earn their livelihoods through informal employment**.
- Informal employment represents:
 - 90% of total employment in low-income countries.
 - 67% of total employment in middle-income countries.
 - 18% of total employment in high-income countries.

- From 2010 to 2016, informal work contributed approximately 40% of **GDP** in Sub-Saharan Africa, Europe, Central Asia, Latin America and the Caribbean.

➤ **In India:**

- India's **informal labour market** accounts for almost **85%** of the country's **workforce**.
 - More than **90%** of this informal workforce works as **self-employed or casual labourers**.
- The informal sector generates **more than half of India's GDP**.
- Over 94% of 27.69 crore informal sector workers registered on the **e-Shram portal** have a monthly income of Rs 10,000 or below and over 74% of the enrolled workforce belongs to **Scheduled Castes (SC)**, Scheduled Tribes (ST) and **Other Backward Classes (OBC)**.

Note:

- The proportion of the General Category workers is 25.56%.
- Around 94% of the registered informal workers have a monthly income of Rs 10,000 or below, while 4.36% have a monthly income between Rs 10,001 and Rs 15,000.

What are the Challenges Posed by the Informal Labour Market?

- **Precarious Employment:** Agricultural labourers and street vendors face **seasonal unemployment** and **low wages** due to a lack of regulation and bargaining power, leading to income inequality and increased **poverty**.
- **Sustainable Livelihoods:** Ensuring sustainable livelihoods and equitable opportunities for the informal workforce is challenging.
- **Social Vulnerability:** Large family sizes place a burden on agricultural labourers, while low incomes trap home-based workers and street vendors in cycles of low social status. This results in limited access to social security, healthcare, and other basic rights.
- **Occupational Hazards:** Waste pickers and recyclers face health risks due to poor working conditions and inadequate safety measures. Child labour is also prevalent in this sector.
- **Institutional Challenges:** Informal workers lack proper legal protection and are vulnerable to harassment by authorities.

What are the Government Schemes for Informal Labourers?

- [Pradhan Mantri Jeevan Jyoti Bima Yojana \(PMJJBY\)](#)
- [Pradhan Mantri Shram Yogi Maan-dhan \(PM-SYM\)](#)
- [Atal Pension Yojana](#)
- [eShram Portal](#)
- Additional Schemes for Unorganized Workers:
 - [Mahatma Gandhi National Rural Employment Guarantee Act \(MGNREGA\)](#)
 - [Deen Dayal Upadhyay Gramin Kausal Yojana](#)
 - [Mahatma Gandhi Bunkar Bima Yojana](#)
 - [Deen Dayal Antyodaya Yojana](#)
 - [Pradhan Mantri Kaushal Vikas Yojana](#)
 - [PM SVANidhi: Micro Credit Scheme for Street Vendors](#)
- The government is **simplifying labour laws** by consolidating them into 4 codes, which are **not yet implemented**.

- [Code of Wages, 2019](#)
- [Industrial Relations Code, 2020](#)
- [Social Security Code, 2020](#)
- [Occupational Safety, Health and Working Conditions Code, 2020](#)

Unorganised Workers' Social Security Act, 2008

- **Coverage:** The Act defines and aims to support informal workers who lack regular employment and social security benefits.
- **Benefits:** The Act empowers central and state governments to **design schemes** offering various benefits like **life insurance, disability coverage, healthcare, maternity support**, and even assistance with education and housing.
- **Governance:** **National and State Social Security Boards** are established to advise and monitor the implementation of these schemes, ensuring proper execution.
- **Registration:** The Act mandates registration of informal workers by the district administration. This creates a record and facilitates delivering benefits.
- **Accessibility:** Worker facilitation centres are envisioned to provide information and help workers access the various schemes offered under the Act.

India's Service Sector

Why in News?

Business activity in India saw robust expansion in May 2024 driven by the dominant **services sector**, with the **HSBC's flash India Composite purchasing managers' (PMI) Index** compiled by **S&P Global** indicating **record export growth** and the highest job addition rate in nearly 18 years.

Purchasing Managers Index

- It is a **survey-based measure** that asks the respondents about changes in their perception of key **business variables** as compared with the previous month.
- The purpose of the PMI is to **provide information** about current and future business conditions to company decision-makers, analysts, and investors.
- It is **calculated separately for the manufacturing and services sectors**, and then a **composite index** is also constructed.

Note:

- The PMI ranges from **0 to 100**, with scores **above 50 indicating expansion**, below 50 indicating contraction, and exactly 50 signifying no change.
- Released at the **start of each month** and considered a leading indicator of economic activity, the **PMI, compiled by IHS Markit (part of S&P Global)** for over 40 economies, reflects insights from a global leader in information and analytics.
- The PMI is a **key economic indicator**, with high readings signalling strong manufacturing and services sector performance and economic growth, while low readings suggest sector struggles and potential economic downturns.
- **Flash Manufacturing PMI** is an estimate of manufacturing for a country, **based on about 85% to 90% of total Purchasing Managers' Index (PMI) survey responses** each month.

What is the Service Sector?

- **About:**
 - The service sector includes **industries offering intangible services**, such as finance, banking, insurance, real estate, telecommunications, healthcare, education, tourism, hospitality, IT, and BPO.
- **Contribution of India's Service Sector:**
 - The services sector **contributes over 50% to India's GDP**.
 - While the **Covid-19** pandemic has hurt most sectors of the economy, the services sector has been the worst affected, as its share in India's Gross value added (**GVA**) declined from 55% in 2019-20 to 53% in 2021-22.
 - India is the **export hub** for software services. The **Indian IT outsourcing service** market is expected to grow 6–8% between 2021 and 2024.
 - In September 2023, India retained its **40th rank** in the **Global Innovation Index (GII)**, due to successful advancements in services that are technologically dynamic and can be traded internationally.
 - The Indian services sector was the **largest recipient of FDI inflows** worth USD 108 billion between April 2000 and December 2023.

What are the Key Highlights of India's Flash Composite PMI?

- **Composite PMI Increase:** The **Flash Composite**

Purchasing Managers' Index (PMI) for India rose to 61.7 in May 2024 from 61.5 in April 2024 indicating robust economic activity.

- **Steep Job Expansion:** May 2024 saw the **sharpest expansion in private sector jobs** since September 2006, driven by strong increases in new orders and capacity pressures.
- **Export Orders:** Both the manufacturing and services sectors saw a record rise in new export orders, **achieving the fastest pace** since the series started in September 2014.
- **Input Costs and Prices:** There was a **faster increase in input costs**, which pushed up the prices charged for Indian goods and services, leading to margin squeezes, particularly for service providers.

What Are the Challenges Related to India's Services Industry?

- **Inadequate Physical Infrastructure:** Inadequate **transport networks** lead to delays and higher expenses (**logistics costs in India constituting 14% of GDP**), double the average in developed nations.
- **Digital Infrastructure:** Limited high-speed **internet access** in rural areas and concerns about **cybersecurity** and data protection affecting customer trust and international compliance standards.
 - For example, In 2019, a **major data breach** at the Indian Railways Catering and Tourism Corporation (**IRCTC**) exposed the personal information of millions of users.
- **Skill Development:** Educational curricula's misalignment with industry needs and insufficient vocational training exacerbate workforce shortages (as per **World Bank**, 22% of graduates are deemed unemployable due to skill mismatches).
- **Employment Practices:** Rigid **labour laws** hinder hiring and firing flexibility, while many service jobs offer **low wages and lack job security**, sometimes leading to mass layoffs.
- **Taxation Issues:** Multiple taxes and **compliance requirements** increase businesses' administrative burden, and although the **Goods and Services Tax (GST)** aimed to simplify the system, its implementation has been challenging for many service providers.
- **Domestic Competition:** Intense competition among numerous SMEs limits profitability, while the **unorganised sector** in the services industry results in **inconsistent service quality** and standards.

Note:

- Moreover, the Indian service sector devoid of clear upstream-downstream distinctions and indigenous origins, risks resembling foreign setups instead of embodying local cultural and economic characteristics.
- **International Competition:** The presence of **established global companies** in sectors such as IT and finance elevates competition for local firms, while **protectionist measures** abroad can restrict market access for Indian service exporters.
 - **For example, the US imposes H-1B visa quotas**, making it difficult for Indian IT companies to send skilled workers to work on projects in the US.
- **Access to Finance:** Limited access to **affordable finance** constrains growth and expansion for service providers, hampering investment in research and development, and thus impacting **innovation** and **competitiveness**.
 - It exacerbates disparity in competitiveness and **market reach between traditional physical establishments and their digital counterparts**.

What are the Potential Opportunities for India in the Service Sector?

- **IT-BPO (Business Process Outsourcing)/ Fintech:** This sector is a **major employer and GDP contributor** in India, with growth potential bolstered by a large pool of skilled IT professionals and government support for the fintech industry.
- **Healthcare & Tourism:** India's rapidly growing healthcare sector is fueled by an ageing population, rising disposable incomes, and a burgeoning **medical tourism industry** offering high-quality care at lower costs compared to developed countries.
- **Logistics & Transportation:** India's **underdeveloped logistics sector** has significant growth potential, bolstered by government infrastructure investments that will create opportunities for logistics and transportation companies.
- **Education:** India's large young population and growing demand for quality education are creating opportunities for companies offering **online education** and vocational training services.
- **Professional Services:** India's **vast pool of skilled professionals** in fields like accounting, law, and consulting is generating opportunities for companies offering professional services to businesses.

Political and Economic Reforms in 1991

Why in News?

As India gears up for the 2024 general election, it is important to reflect on the pivotal **1991 Indian general elections**, which marked a significant turning point in the country's history.

- These elections led to profound political and economic changes, driven by the leadership of **PV Narasimha Rao** and the impactful electoral reforms spearheaded by T N Seshan.

What were the Key Electoral Reforms Introduced by T. N. Seshan?

- Tirunellai Narayana Iyer Seshan (T N Seshan) was appointed the **Chief Election Commissioner (CEC)** from 1990 to 1996 and spearheaded a series of groundbreaking reforms that significantly transformed the Indian electoral process.
- **Key Reforms:**
 - **Voter ID cards:** Widely known as **EPIC (Electors Photo Identity Card)**, this was introduced in his tenure to prevent impersonation and bogus voting.
 - **Strict enforcement of MCC:** The **Model Code of Conduct (MCC)**, existing since 1960, outlines guidelines for political parties during elections. Seshan rigorously enforced it, **curbing misuse of power and unfair advantages**.
 - **Curbing electoral malpractices:** The **Election Commission** under Seshan's leadership listed 150 malpractices.
 - He cracked down on **vote buying, bribing, intimidation of voters, booth capturing, and the use of muscle power**.
 - He also banned excessive spending and public displays during campaigns.
 - **Independent and impartial elections:** Seshan ensured deployment of central police forces to maintain order and prevent violence. He also **advocated for autonomous status for the Election Commission**.
- **Seshan's Reforms Impact on the 1991 Elections:**
 - The 1991 elections were conducted with unprecedented integrity and transparency, setting new standards for future elections.

Note:

- Despite the prevailing political instability, a **turnout of 56.73%** was recorded. This was lower than the 61.95% in 1989 but reflected a **more genuine participation compared to previous elections marred by irregularities.**
- **Long-term Impacts:**
 - Transformed the Election Commission from a **passive observer to an active enforcer of electoral laws.**
 - Strengthened the **autonomy and integrity** of the Election Commission, ensuring free and fair elections.
- **Recognition:**
 - Seshan's efforts in electoral reforms earned him the prestigious **Ramon Magsaysay Award in 1996**, highlighting his impact on global standards of electoral integrity.

- Following **Rajiv Gandhi's** death, PV Narasimha Rao was sworn in as Prime Minister on 21st June 1991.

How did Economic Reforms Unfold Under Rao's Government?

- **Economic Crisis:** India was on the verge of a **sovereign default** due to depleted **foreign exchange reserves**, exacerbated by the **Gulf War (1991)** which led to increased oil prices and reduced remittances from overseas workers.
 - The fiscal deficit soared to **8% of GDP**, and the **current account deficit** was **2.5% of GDP**. **Inflation rates** were in double digits, further burdening the population.
 - **Forex reserves plummeted to less than USD 6 billion**, barely enough to cover two weeks' worth of imports.
- **Immediate Measures to Mitigate the Crisis:**
 - **Rupee Devaluation:** On 1st July 1991, the **rupee was devalued by 9% against major currencies**, followed by an additional 11% devaluation two days later. This was aimed at making Indian exports more competitive.
 - Rao chose a phased devaluation to manage the political and economic shock.
 - **Pledging Gold Holdings:** The **Reserve Bank of India (RBI)** pledged gold with the Bank of England in July 1991, raising around USD 400 million.
 - In May 1991, during national elections, 20 tonnes of gold were sold to the Union Bank of Switzerland, raising approximately USD 200 million.

ELECTORAL REFORMS IN INDIA

ELECTORAL REFORMS ARE CHANGES MADE TO IMPROVE THE ELECTION PROCESS AND ENSURE FAIRNESS

Electoral Reforms Before 1996

- ⊕ **Model Code of Conduct (1969):** Guidelines to regulate political parties and candidates prior to elections
- ⊕ **61st Constitutional Amendment Act (1988):** Lowering of the voting age from 21 to 18 years
- ⊕ **Electronic Voting Machines (EVMs) (1989):** Switched from individual colored ballot boxes to ballot papers, and later to EVMs
- ⊕ **Booth Capturing (1989):** Provision for adjournment of poll or countermanding of elections in such cases
- ⊕ **Elector's Photo Identity card (EPIC) (1993):** Electoral roll is the basis to issue EPIC to registered electors
- ⊕ **ECI- A Multi-member Body (1993):** Election commissioners were appointed in addition to CEC

Electoral Reforms of 1996

- ⊕ **Time-limit for By-elections:** Elections must occur within 6 months of any vacancy in a legislative house
- ⊕ **Listing of Names of Candidates:** Contesting candidates categorized into 3 groups for listing
 - ⊕ Recognised & registered-unrecognised political parties
 - ⊕ Other (independent)
- ⊕ **Disqualification for Insulting the National Honour Act, 1971:** Leads to election disqualification for 6 years upon:
 - ⊕ Insulting the National Flag, Constitution of India or preventing the singing of National Anthem

Electoral Reforms After 1996

- ⊕ **Vote Through Proxy (2003):** Service voters in Armed Forces & forces under Army Act can vote by proxy
- ⊕ **Allocation of Time on Electronic Media (2003):** Equitable sharing of time on electronic media during elections to address the public
- ⊕ **Introduction of Braille Signage Features in EVMs (2004):** To facilitate the visually impaired voters to cast their votes without an attendant

Electoral Reforms Since 2010

- ⊕ **Voting Rights to Indian Citizens Living Abroad (2010)**
- ⊕ **Online Enrollment in Electoral Roll (2013)**
- ⊕ **Introduction of NOTA option (2014)**
- ⊕ **VVPAT Voter Verified Paper Audit Trail (2013):** Introduction of VVPAT with EVMs to conduct free and fair elections
- ⊕ **Photos of Candidates on EVMs and Ballot Papers (2015):** To prevent confusion in constituencies with namesake candidates
- ⊕ **Introduction of Electoral bonds (2017 Budget):** An alternative to cash donations for political parties
 - ⊕ Declared as unconstitutional by SC (2024)
- ⊕ **Launch of Electronic EPIC (2021)**
- ⊕ **Home Voting for People with Disabilities & Those Above 85 years of Age (2024)**

IMPORTANT COMMITTEES/ COMMISSION		
Committees/ Commission	Year	Purpose
■ Tarkunde Committee	1974	■ By Jaya Prakash Narayan (JP) during the "Total Revolution" movement.
■ Dinesh Goswami Committee	1990	■ Electoral Reforms
■ Vohra Committee	1993	■ On the Nexus between Crime and Politics
■ Indrajit Gupta Committee	1998	■ State Funding of Elections
■ Second Administrative Reforms Commission of India	2007	■ Report on Ethics in Governance (Headed by Veerappa Moily)
■ Tankha Committee (Core Committee)	2010	■ To look into the whole gamut of the election laws & electoral reforms.

What was the Political Context of the 1991 Elections?

- In May 1991, Rajiv Gandhi was assassinated by a suicide bomber from the **Liberation Tigers of Tamil Eelam (LTTE)** leading to a politically charged and fractured environment during the elections.

Note:

- Earlier in the year, the government secured about USD 2 billion in emergency loans from the **International Monetary Fund (IMF)**.
- **LPG Reforms:**
 - **PM Rao** along with **Finance Minister Manmohan Singh**, initiated the **LPG reforms (Liberalization, Privatization, and Globalization)** that were introduced as a cornerstone of India's economic strategy to overcome the crisis and promote sustainable growth.
 - Liberalisation:
 - **New Trade Policy:** Introduced to boost exports by revamping the licensing process and linking non-essential imports to exports.
 - **Exim Schemes:** The government removed export subsidies and instead introduced **tradeable exim schemes** for exporters based on the value of exports.
 - The policy ended the monopoly of state-owned firms over imports, enabling the private sector to import goods independently.
 - **Ending Licence Raj:** The new industrial policy dismantled the licence raj, **relaxing Monopolies and Restrictive Trade Practices Act** provisions to facilitate business restructuring and mergers.
 - The policy abolished industrial licensing for all but 18 industries, irrespective of investment levels.
 - **Privatisation:**
 - **FDI Reforms:** Automatic approval for **foreign direct investment (FDI)** up to 51% was introduced, compared to the previous cap of 40%.
 - **Public Sector Monopoly Restriction:** Restricted public sector monopoly to sectors critical for national security.
 - **Opening Markets:** These changes made it easier to do business in India, attracting a deluge of foreign goods and investments in subsequent years.
 - **Globalisation:**
 - **Economic Policies:** The reforms aimed at integrating India's economy with the global market, encouraging international trade and investment.
 - **Boosting Exports:** With the massive devaluation of the rupee and new trade policies, Indian exports became more competitive globally.

➤ **Impact of LPG Reforms:**

- The LPG reforms in India led to high economic growth, with GDP increasing from USD 270 billion in 1991 to USD 2.9 trillion in 2020.
 - FDI inflows also increased significantly, reaching USD 82 billion in 2020-21 from USD 97 million in 1991.
 - The reforms dismantled the License Raj, promoting industrial growth in sectors such as IT, telecom, and automobiles.
 - While the reforms created jobs and reduced poverty, there are **still concerns about job quality and income inequality**.
 - The reforms also integrated the Indian economy into the global economy, increasing trade and investment flows, with India's share in global trade rising from 0.5% in 1991 to around 2% in 2022.

Rising Debt Strained Household Savings

Recently, there has been debate on the issue of drastic **fall in Household Net Financial Savings compared to GDP Ratio** during 2022-23 due to **higher Borrowing to GDP ratio**.

- The **Chief Economic Advisor (CEA)** to the Government of India interpreted this as a **mere shift in the composition of household savings**, where households incurred greater borrowing (or reduced net financial savings) solely to finance higher physical savings (investment).
- However, some **experts disagree**. They think there might be bigger economic reasons behind the trend, not just people's spending habits.

Chief Economic Adviser (CEA) to the Government of India

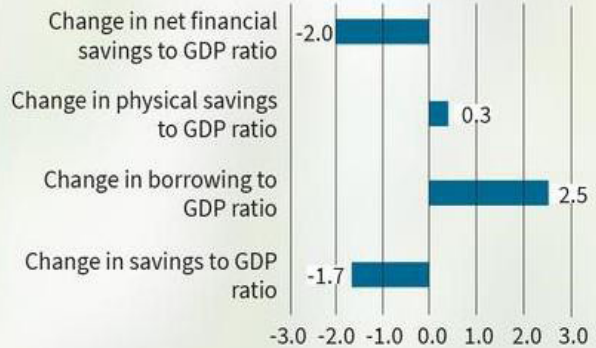
- He advises the government on economic matters and is responsible for the preparation of the **Economic survey** of India tabled in **Parliament** before the Union budget of India is presented.
- CEA is head of **Economic Division of the Department of Economic Affairs**, Ministry of Finance, Government of India
- He holds the rank of a **Secretary** to the Government of India.

Note:

Note:

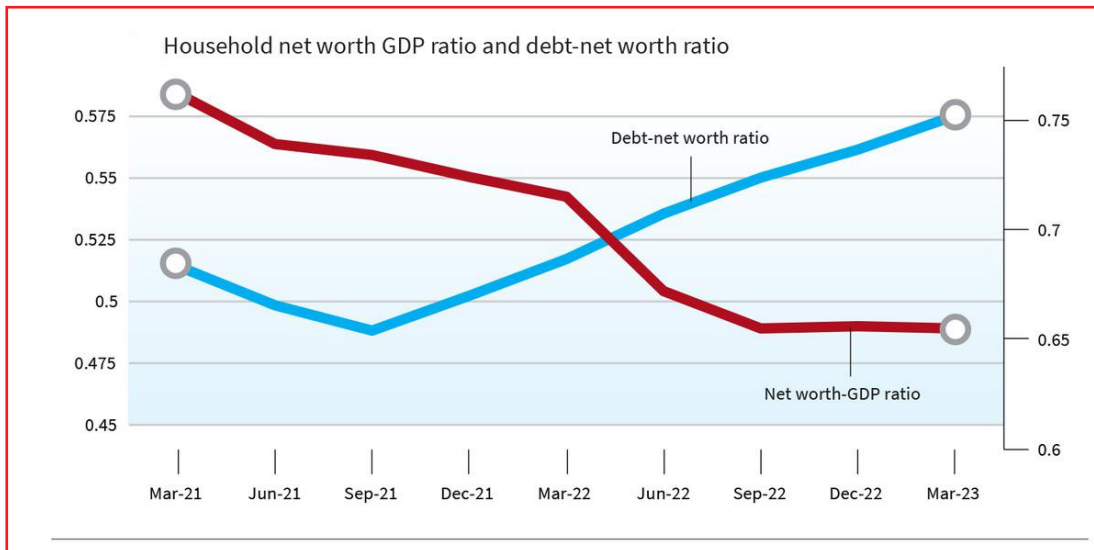
- **Household Net Financial Savings:** It refers to the **portion of household income** that is **saved and invested** in financial assets, such as bank deposits, stocks, bonds, and other financial instruments, **after accounting for financial liabilities** like loans and mortgages.
 - It represents the **net change in financial assets** held by households over a period.
 - Higher Net financial Savings indicates higher economic stability.
- **Household Savings to GDP Ratio:** The **household savings to GDP ratio** is the sum of its **net financial savings to GDP ratio, physical savings to GDP ratio and gold and ornaments**.
 - In mathematical expression form: **Household Savings=Net Financial Savings+Physical Savings+(Gold and Ornaments)**.

- This **contradicts the government view** that greater borrowing (reduced net financial savings) has led to higher physical savings.
- The **household savings to GDP ratio declined by 1.7% points** while the gold savings to GDP ratio remained largely unchanged.

Deciphering trends: Changes in the components of the savings to GDP ratio in FY21-FY23**What are the Current Changes in the Saving Pattern?**

- **Increased Borrowing And Asset Stagnation:**
 - There has been a **greater borrowing (2.5 % points)**, leading to **reduced net financial savings (-2.0% points)**, but **physical savings and investment has not increased much (only 0.3% points)**.

- **Decline in Household Financial Wealth to GDP Ratio:**
 - Households are **getting poorer relative to the overall economy**, while also borrowing more money. This is because the **ratio of household financial wealth to GDP has fallen sharply**, while the **debt-to-net-worth ratio has risen**.



- **Rise in Interest Payment Burden:** Interest payment burden is the product of interest rate and **debt-income (DTI) ratio** at a given interest rate.
 - The **debt-to-income (DTI) ratio** is a financial metric that compares an **individual's monthly debt payments to their gross monthly income**.

Note:

- A **higher debt-to-income ratio** indicates that a **person may be at risk of defaulting on their loans**, while a lower ratio demonstrates that they have more disposable income to cover their debt obligations.
- The recent period has been associated with a sharp rise in both these variables (DTI and interest payment).
- The **debt-income ratio** of households can change due to two factors.
 - **Higher net borrowing-income ratio**, where net borrowing is the difference between total borrowing and interest payments.
- Household's stock of debt would rise at any given level of income if they decide to increase their net borrowing for financing higher investment or consumption.
 - **Increase in interest rates or reduction in nominal income growth rate.**
- If the growth in interest payments outweighs income growth, the debt-income ratio will continue to grow. Such mechanisms can be described as **"Fisher dynamics" (phenomenon of rising debt-income ratio in terms of changes in interest rate and nominal income growth rate).**
- **Household Income Growth Lags Behind Lending Rate:**
 - For the period 2019-20 to 2022-23, the average value of the **growth rate of household disposable income** (8% in 2019-20 to 2021-22 and **9.3%** in 2019-20 to 2022-23) has been **lower** than the **weighted average lending rate (WALR)** (9.3% in 2019-22 and **9.4%** in 2019-23).
 - The average value of the lending rate for this period is constructed from the **Reserve Bank of India's** quarterly figures.
- **Decline in Savings and Investment Between 2003-08 and 2019-22:**
 - From 2003-04 to 2007-08, **Average Gross National Income (GNI) growth rate** (14.5%) was **greater** than the **average lending rate** (11.5%).
 - This implied that **incomes were growing faster than the cost of borrowing.**
- **Fisher Dynamics at Play Since 2019-20:**
 - It is the phenomenon of **rising debt-income ratio** due to changes in **interest rate and nominal income.**
 - Since the economic slowdown in 2019-20, the Indian economy has shown signs of **Fisher dynamics.**
 - After, **Covid-19** there has been a **sharp increase in the amount of debt compared to income for households**, mainly due to lower nominal income growth rate.

	2019-20 to 2021-22	2019-20 to 2022-23
Avg. lending rate (RBI)	9.3	9.4
Average household GDI [^] growth rate	8.0	9.3
Average household GDI growth rate minus Average WALR*	-1.3	-0.1

	2003-04 to 2007-08	2019-20 to 2021-22
Average Lending rate (IMF)	11.8	8.8
Average GNI** growth rate	14.5	8.7
Average GNI growth rate minus Avg lending rate	2.7	-0.1

Note:

- With the emergence of the Fisher dynamics, there are **2 unique challenges that confront the Indian economy**.
 - **Increasing Income-Debt Gap:** It can lead to higher interest payments for households.
 - **Reduced Consumption:** Higher debt prompts households to cut back on spending. The consumption to GDP ratio dropped in 2023-24, showing this trend.

What are the Macroeconomic Implications of Rising Household Debt Burden?

- **Debt repayment:** It can become difficult if interest rates rise faster than income growth. This can **strain the financial sector as they receive less interest income** from households struggling to repay debt. This in turn **can lead to reduced credit availability for businesses**.
- **Consumption Demand:** It can also be reduced by high household debt. If **households feel financially insecure, they may save more and spend less**, slowing down the overall economy.
- **Higher Interest Rates to Fight Inflation:** If interest rates are raised to combat inflation, this can **worsen household debt burdens and push them into a debt trap**. This is because higher interest rates will **increase the amount of money that households have to pay on their debts**.
- **Financialisation of the economy:** The shift towards financial assets in household balance sheets suggests that the economy is becoming more financialised. This means that **a larger share of economic activity is focused on financial markets rather than on the production of goods and services**. This can make the economy more fragile and prone to financial crises.
 - Financialisation refers to a trend in economies where financial markets take **precedence over production, with individuals turning to financial assets like stocks and bonds to accumulate wealth**.

India's Critical Mineral Acquisition Plans in Africa

Why in News?

India is stepping up its **critical mineral acquisition plans in Africa**, challenging China's dominant position in the region.

- The race for critical minerals is a key focus, with India securing mining collaborations and access agreements with several African nations.

Why is India Stepping Up its Critical Mineral Acquisition Plans in Africa?

- **Resource Securitisation:** Ensure a stable and reliable supply of critical minerals for India's domestic industries, particularly the **growing electric vehicle (EV) and renewable energy sectors**.
 - **Reduce dependence on imports** and mitigate potential supply chain disruptions.
 - Support the country's push towards **self-reliance and strategic autonomy** in critical sectors.
- **Countering China's Dominance:** China is estimated to control over 5% of cobalt processing facilities in the **Democratic Republic of Congo (DRC)**.
 - Chinese companies are estimated to own 80% of the **Tenke Fungurume mines**, which produce nearly 12% of the world's cobalt resource.
 - China has also made substantial investments in securing lithium resources in Zimbabwe.
 - India aims to establish a stronger presence in the African mining sector to counterbalance China's influence.
- **Access to High-Quality Reserves:**
 - Africa holds significant reserves of critical minerals like cobalt, **copper, lithium**, and **rare earth elements**.
 - **Over 30% of the world's critical mineral deposits are found in Africa**, presenting an opportunity for African countries to become major global suppliers and trade among themselves.
 - Acquire access to high-quality and economically viable mineral deposits to meet India's growing demand.
 - Leverage Africa's mineral wealth to support India's industrial and technological aspirations.
- **Strengthening Bilateral Ties:** India is leveraging **government-to-government (G2G)** negotiations to secure mining collaborations and access **agreements with African nations**.
 - India has signed MoUs with South Africa, Mozambique, Congo, Tanzania, Zambia, Malawi, the Republic of Cote d'Ivoire, and Zimbabwe.
 - This helps India build stronger diplomatic and economic ties with countries in the region.

Note:

- A **Confederation of Indian Industry (CII)** report stated that **Indian investments in Africa could reach USD 150 billion by 2030**. It noted that since April 1996, India has invested USD 74 billion in Africa.

Sl. No.	Critical Mineral	Percentage (2020)	Major Import Sources (2020)
1.	Lithium	100%	Chile, Russia, China, Ireland, Belgium
2.	Cobalt	100%	China, Belgium, Netherlands, US, Japan
3.	Nickel	100%	Sweden, China, Indonesia, Japan, Philippines
4.	Vanadium	100%	Kuwait, Germany, South Africa, Brazil, Thailand
5.	Niobium	100%	Brazil, Australia, Canada, South Africa, Indonesia
6.	Germanium	100%	China, South Africa, Australia, France, US
7.	Rhenium	100%	Russia, UK, Netherlands, South Africa, China
8.	Beryllium	100%	Russia, UK, Netherlands, South Africa, China
9.	Tantalum	100%	Australia, Indonesia, South Africa, Malaysia, US
10.	Strontium	100%	China, US, Russia, Estonia, Slovenia
11.	Zirconium(zircon)	80%	Australia, Indonesia, South Africa, Malaysia, US
12.	Graphite(natural)	60%	China, Madagascar, Mozambique, Vietnam, Tanzania
13.	Manganese	50%	South Africa, Gabon, Australia, Brazil, China
14.	Chromium	2.5%	South Africa, Mozambique, Oman, Switzerland, Turkey
15.	Silicon	<1%	China, Malaysia, Norway, Bhutan, Netherlands

The net import reliance for critical minerals of India (2020) (Source: A report on 'Unlocking Australia-India Critical Minerals Partnership Potential' by Australian Trade and Investment Commission, July 2021)

What are India's Other Overseas Critical Mineral Acquisition Plans?

- **Khanij Bidesh India Ltd (KABIL)**: It is a joint venture of National Aluminium Company Ltd (NALCO), Hindustan Copper Ltd (HCL), and Mineral Exploration and Consultancy Ltd (MECL) the **Central Public Sector Enterprises (CPSEs)** under the **Ministry of Mines**.
 - It aims to source and process strategic minerals from foreign sources, particularly focusing on battery minerals for supply in India.
- **Coal India Limited (CIL)**: It is targeting the acquisition of lithium, cobalt, and nickel assets abroad, as it aims to diversify its operations beyond its core coal business.
 - **CIL** has amended its Memorandum of Association to **include non-ferrous and critical minerals**.

- **Minerals Security Partnership (MSP)**: India joined the **Mineral Security Partnership (MSP)** in June 2023, making it the 14th member alongside countries like the United States, Australia, Canada, and others.
 - India seeks to leverage this framework to aid **Indian public sector undertakings (PSUs)** in acquiring critical mineral assets abroad.
 - Established in 2022, MSP aims to build reliable supply chains through collaboration between governments and industry, providing diplomatic and financial aid for strategic projects along the value chain.
- **Supply Chain Resilience initiative (SCRI)**: Collaboration with Australia and Japan aimed at ensuring supply chain resilience for critical minerals.

Note:

- **Australian Partnership:** India signed the Critical Minerals **Investment Partnership with Australia** to invest in critical minerals projects.
- **Global Collaborations:** India is collaborating with countries like Chile, Argentina, and Bolivia, known for their significant lithium resources.
 - **India is in talks with Sri Lanka to acquire a graphite mine block**, as part of its plan to secure critical mineral supplies globally.
 - Graphite is crucial for India as it is used in battery manufacturing. The **Sri Lankan graphite is considered among the purest in the world**, with over 98% carbon content.

What Initiatives have Prompted India to Secure Critical Minerals?

- **Panchamrit Vision:** India's commitment to **climate change** mitigation includes growing **non-fossil fuel energy capacity to 500 GW by 2030** and achieving **Net Zero emissions by 2070**.
- **Strategic Initiatives:**
- **Planning Commission (2011):** Highlighted the need for strategic mineral resources.
- **Expert Committee (2019):** Focused on cobalt and lithium sourcing from Australia, Argentina, and Bolivia.
- **Geological Survey of India (GSI):** Focused on finding new resources through advanced exploration techniques.
- **MMDR Amendment Act, 2023:** The **Mines and Minerals (Development and Regulation) Amendment Act, 2023**, amend the Mines and Minerals (Development and Regulation) Act, 1957, to strengthen the exploration and **extraction of critical minerals essential for India's economic development and national security**.
- **Offshore Area Minerals (Development And Regulations) Amendment Act, 2023:** It regulates the **mining of minerals in the maritime zones of India**, categorising activities into reconnaissance, exploration, and production.

Critical Minerals

- **About:** Critical minerals are those minerals that are **essential for economic development and national security**, the lack of availability of these minerals or even the concentration of existence, extraction or processing of these minerals in a few geographical locations may lead to supply chain vulnerability and disruption.

- In June 2023, India published its first detailed report on critical minerals, identifying 30 essential minerals.
 - These minerals are Antimony, Beryllium, Bismuth, Cobalt, Copper, Gallium, Germanium, Graphite, Hafnium, Indium, Lithium, Molybdenum, Niobium, Nickel, PGE, Phosphorous, Potash, REE, Rhenium, Silicon, Strontium, Tantalum, Tellurium, Tin, Titanium, Tungsten, Vanadium, Zirconium, Selenium and Cadmium.
- **Significance:** These minerals are crucial for manufacturing mobile phones, computers, batteries, EVs, solar panels, and wind turbines.
 - The **Indian Economic Survey 2022-23** highlighted the significance of rare earth elements and critical minerals as potential future geopolitical battlegrounds, akin to crude oil over the past 50 years.
 - The shift to clean energy technologies is rapidly increasing the demand for critical minerals.
 - India's domestic EV market is projected to grow at a **compounded annual Growth Rate (CAGR) of 49% from 2022 to 2030**, with an anticipated annual sales volume of 1 crore by 2030, driving demand for advanced chemistry cell (ACC) batteries.

Need for New Agriculture Export-Import Policy

Why in News?

Recently, **Department of Commerce data** revealed that **India's agricultural exports** declined by 8.2% in 2023-24, primarily due to government curbs on various commodities. Meanwhile, agricultural imports dropped by 7.9% due to lower edible oil prices.

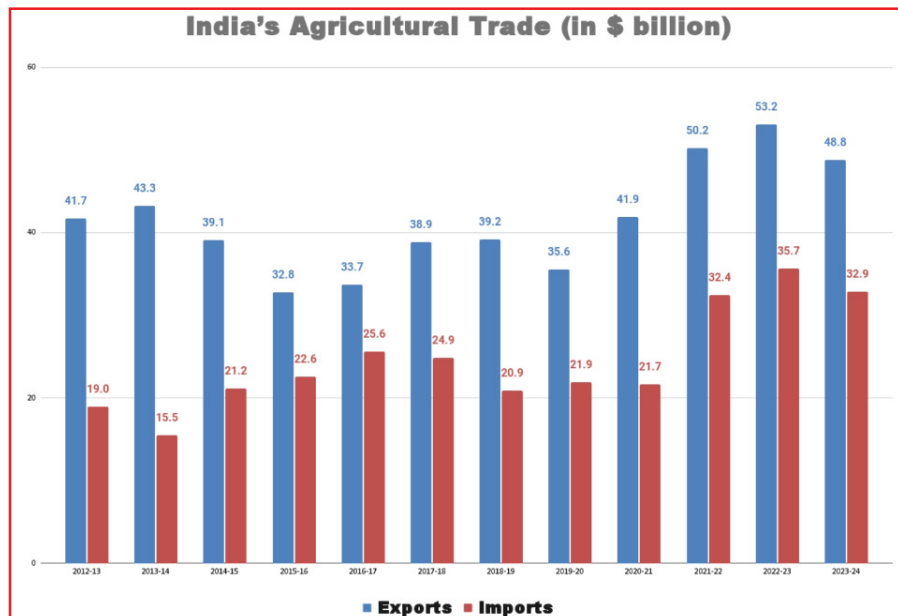
- These trends underscore the **need for a balanced agriculture export-import policy** to stabilise the agricultural sector and ensure both domestic availability and market growth.

What is the Current State of Indian Agricultural Exports and Imports?

- **Agricultural Exports:**
 - India's **agricultural exports** witnessed a substantial decline of 8.2% in the fiscal year 2023-24, totalling USD 48.82 billion.

Note:

- This drop comes after a record-breaking performance of USD 53.15 billion in the previous fiscal year 2022-23.
- **Declined Commodities:**
 - **Sugar Exports:** No **sugar exports** were allowed from October 2023, reducing exports to USD 2.82 billion in 2023-24 from USD 5.77 billion in the previous year.
 - **Non-Basmati Rice Exports:** Concerns over **domestic availability and food inflation triggered** a ban on all white non-**basmati rice exports** from July 2023.
- Currently, only parboiled grain shipments are permitted within the non-basmati segment, attracting a 20% duty.
- These restrictions have pulled down overall non-basmati exports from a record USD 6.36 billion in 2022-23 to USD 4.57 billion in 2023-24.
 - **Wheat Exports:** Exports stopped in May 2022, plummeting to USD 56.74 million in 2023-24 from USD 2.12 billion in 2021-22.
 - **Onion Exports:** In May 2024, the Centre lifted a ban on **onion exports**. Simultaneously, a floor price of USD 550 per tonne (below which no exports can take place) and a 40% duty were imposed.
- Official data reveals onion exports at only 17.08 lakh tonnes (lt), worth USD 467.83 million, during April-February 2023-24, as against 25.25 lt (USD 561.38 million) for the whole of 2022-23.
 - **Growth in Other Commodities:**
 - Basmati rice and spices exports saw growth, with basmati rice reaching USD 5.84 billion and spices crossing the USD 4 billion mark for the first time.
 - Exports of **marine products**, castor oil, and other cereals (mainly maize) also posted growth, contributing to the overall export basket.
- **Agricultural Imports:**
 - **India's agricultural imports witnessed a 7.9% dip** during the fiscal year 2023-24, reflecting the impact of global market conditions and domestic demand.
 - **Reduced Edible Oil Imports:**
 - The significant decline in overall agricultural imports was largely due to a **single commodity: edible oils**.
 - India's imports of vegetable fats topped USD 20 billion in 2022-23, a year immediately after the **Russia-Ukraine war** when global prices for vegetable oils were at their peak.
 - However, in 2023-24, the average **FAO vegetable oil sub-index eased to 123.4 points**, indicating lower global prices.
 - As a result, the vegetable oil import bill fell below USD 15 billion during the last fiscal year.
 - **Surge in Pulse Imports:**
 - Imports of pulses almost doubled to USD 3.75 billion in 2023-24, the highest since the USD 3.90 billion and USD 4.24 billion levels of 2015-16 and 2016-17, respectively.
 - The surge in pulse imports highlights the continued dependence on foreign sources to meet domestic demand for this essential commodity.



Note:

What are the Key Factors Influencing India's Agricultural Exports and Imports?

- **Export Restrictions:** The government has imposed curbs on the export of commodities like rice, wheat, sugar, and onions due to concerns over domestic availability and food inflation.
 - These restrictions have led to a significant decline in the exports of these commodities.
- **Global Price Movements:** The [UN Food and Agriculture Organization's \(FAO\) food price index \(base: 2014-16=100\)](#) is used as a reference to track global agri-commodity prices.
 - The FAO food price index dipped from an **average of 119.1 points in 2013-14 to 96.5 points between 2013-14 and 2019-20**, reflecting a crash in global agri-commodity prices.
 - This crash in global prices reduced the cost competitiveness of India's agricultural exports.
 - However, the global price recovery following the [Covid-19 pandemic](#) and the [Russia-Ukraine war](#) led to the FAO index soaring to 140.8 points in 2022-23.
 - This spike in global prices resulted in India's farm exports and imports zooming to all-time highs in 2022-23, before dropping in the fiscal year 2023-24.
 - In 2023-24, the average FAO index eased to 121.6 points, while the vegetable oil sub-index fell to 123.4 points, leading to a decline in India's edible oil import bill.
- **Government Policies:** The government's decision to maintain low or zero import duties on pulses and edible oils contradicts its goal of boosting domestic production.
 - This policy favours **imports over domestic cultivation**, potentially discouraging farmers from diversifying crops. Ultimately, it undermines long-term agricultural development and self-sufficiency.

What is Agricultural Export Policy?

- **About:** An [agricultural export policy](#) consists of a collection of government rules, actions, and encouragements aimed at **regulating and boosting** the export of agricultural goods from a specific nation.
 - The policy encompasses [export subsidies](#), [tariff reductions](#), quality standards, market access agreements, financial incentives, and trade promotion initiatives to **boost agricultural producers'** and exporters' **access to international markets** and enhance their **competitiveness**.

- **India's Agriculture Export Policy, 2018:** In December 2018, the government implemented a **comprehensive agriculture export policy** aimed at leveraging India's agricultural export potential using appropriate policy measures to establish India as a **leading force in global agriculture** and increase the income of farmers.
 - **Objective:** It aimed at **doubling agricultural exports** from USD 30+ billion to over USD 60 billion by 2022.
 - It was expected that farmers would get the benefit of export opportunities in the overseas market.
 - It would **promote ethnic, organic**, traditional, and non-traditional Agri products exports.
 - To establish a **monitoring framework** to oversee the implementation of the Agricultural Exports Policy.
 - Elements:
 - **Strategic:** Policy measures, infrastructure, and logistics; supporting a **holistic approach** to boost exports; greater involvement of state governments in agricultural exports.
 - **Operational:** Focus on clusters, promoting value-added exports, marketing and promotion of **"Brand India,"** attracting private investments into production and processing, establishing a strong quality regime, and research & development.

What are the Challenges to the Agri-Export Policy of India?

- **Policy Instability and Double Standards:** Frequent **changes in export policies**, often aimed at protecting domestic consumers from price hikes, can adversely affect farmers and traders. Sudden bans and restrictions, such as those on wheat and onions, **disrupt market stability and long-term trade relationships**.
- **Conflicting Goals:** The government's reduced import duties on pulses and low tariffs on edible oils aim to **ensure consumer affordability but conflict with promoting domestic crop diversification** to less water-intensive and import-substituting crops.
- **Subsidy Centric Schemes:** Populist measures during election seasons, like increased consumer food and farmer [fertilizer subsidies](#), [loan waivers](#), and free power, though politically popular, undermine fiscal discipline and the agricultural sector's financial health.
- **Inadequate R&D Investment:** India's investment in agricultural R&D is around 0.5% of agricultural GDP, **insufficient for substantial growth**, and needs to be doubled or tripled to enhance production and exports.

Note:

- **Quality and Standards:** Ensuring **consistent quality and compliance** with international sanitary and phytosanitary (SPS) standards is a significant challenge for Indian agricultural exports due to pests and diseases.
- **Competitiveness:** India faces competition in **pricing and quality** in its agricultural exports, whereas exchange rate fluctuations also influence competitiveness.

Government Schemes to Promote Agri-Export in India

- **Operation Greens**
- **Market Access Initiative (MAI)**
- **National Horticulture Mission (NHM)**
- **APEDA (Agricultural and Processed Food Products Export Development Authority)**
- **Setting up of Agri Export Zones (AEZs)**

US Federal Reserve Keeps Rates Steady as Inflation Persists

Why in News?

Recently, the **US Federal Reserve** maintained interest rates in a target range between **5.25%-5.5%** and indicated that borrowing costs are likely to stay higher. Annual inflation in the US is currently at **3.5%**, compared to **3.2%** in the UK and **2.4%** in the **eurozone**.

INFLATION AND RELATED TERMS

INFLATION

- ◆ Rise in goods/services prices; corresponding decline in purchasing power
- **Creeping Inflation:** Mild/moderate inflation where price level persistently rises over a period of time at a mild rate (single digit inflation rate)
- **Galloping Inflation:** Occurs when mild inflation is not checked/controlled (inflation in double/triple digits - 20/100/ 200% annually)
- **Hyperinflation:** Prices rise a million or even a trillion percent annually (witnessed by Germany in 1920s)

CORE INFLATION

- ◆ Change in costs of goods/services but **excluding those from food/energy sectors** (due to price volatility)

HEADLINE INFLATION

- ◆ **Headline Inflation** - Change in value of all goods in the basket (including food and energy)

$$\text{Core} = \text{Headline} - \text{Food \& fuel items}$$

STAGFLATION

- ◆ When **inflation, unemployment and economic stagnation/recession** occur simultaneously; **most difficult type of inflation** to manage
- Witnessed by developed countries in the **1970s (US, UK)** when world oil prices rose dramatically

DEFLATION

- ◆ **Reverse of inflation** - a sustained decline in price of goods/services
- Here, **annual inflation rate falls below 0%** resulting in an increase in the real value of money (Japan suffered for almost a decade in **1990s**)
- **Can worsen into recession/depression;** hence, more dangerous than inflation

DISINFLATION

- ◆ When inflation rate decelerates
- Implies that prices are rising (**inflation is happening**) but at a **slower rate** each passing month

Deflation is decline in prices, whereas disinflation is a decline in inflation rate



REFLATION

- ◆ Typically **follows deflation**
- Policymakers try to **stimulate economic activity by producing inflation** (more govt spending, reduced interest rates etc.)

SKREWFLATION

- ◆ **Skewness of inflation** among different sectors of the economy - **some sectors facing huge inflation** while some **none** and some even deflation

GREEDFLATION

- ◆ Where (corporate) **greed is fuelling inflation;** companies increasing their prices beyond just covering costs to maximise profits

SHRINKFLATION

- ◆ **Hidden form of inflation;** often leads to **customer frustration/dissatisfaction**
- Practice of **reducing the size of a product** while maintaining its sticker price



What are the Reasons Behind the Recent US Federal Reserve Decision?

- **Inflationary Pressures:**
 - The US inflation rate peaked in 2021 and 2022 at 7.0% and 6.5% respectively, and then declined at the end of 2023 but it still remains stubbornly **high at 3.5%**.
 - This is significantly above the **US Fed's target of 2%**.
 - This persistent inflation suggests that previous measures, like raising interest rates, haven't brought inflation down as quickly as hoped.
- **The Wait-and-See Approach:**
 - Earlier in the year, the **fed anticipated inflation would decline** and projected rate cuts. However, the current situation has forced them to reconsider.
 - By holding rates, the **US Fed** buys itself time to gather more data. They'll be closely monitoring inflation metrics, employment figures, and consumer spending patterns.
 - This data will guide their future decisions on whether to raise rates to combat inflation or leave them unchanged to support economic growth.

Note:

Why do Central Banks Resort to a Rate Hike?

- The central bank may increase interest rates to control **inflation**.
- This is being done to **reduce the amount of money available for borrowing**, which can help to cool down the economy and prevent prices from rising too quickly.
- With **higher borrowing costs**, people and companies may be **less willing to borrow**, which can slow down economic activity and growth.
 - Businesses may **take fewer loans**, hire fewer people, and **reduce production** in response to the increased costs of borrowing.

How do US Fed Rates Impact the Indian Economy?

- **Capital Outflows:**
 - The Fed's rate hikes make **US dollar-denominated assets** (bonds, treasuries) **more attractive**. This triggers a phenomenon called the "carry trade."
 - Investors borrow money in low-interest-rate countries like India and invest it in the US to earn higher returns. This outflow of capital (capital flight) from other countries can:
 - **Slow Economic Growth:** Reduced foreign investment can hinder the growth of Indian companies and the overall economy.
 - **Impact on stock markets:** The sudden withdrawal of foreign investment can lead to stock market volatility and potentially decreased valuations.
- **Inflation:**
 - Changes in the **US Fed rates** can have significant effects on capital flows and the exchange rate which can **result in inflation**.
 - By **adjusting domestic interest rates** and liquidity measures, the RBI can try to mitigate the inflationary impacts of a weaker rupee.
- **Weaker Rupee:**
 - When **foreign investors pull their money** out of India due to the higher US returns, it **reduces the supply of USD in India** and increases the supply of INR. This imbalance **weakens the Indian rupee**.
 - This has a **double-edged effect**:
 - **Imported Inflation:** Cheaper rupees make **imports more expensive**, especially for crucial resources like oil. This can push up the overall cost of living in India.

- **Potential Export Boost:** A weaker rupee can **make Indian exports cheaper** in the global market, potentially increasing their competitiveness.

➤ Higher Borrowing Costs:

- The **Reserve Bank of India (RBI)** might raise interest rates in India to match the Fed's move to:
 - **Control Inflation:** Higher interest rates **discourage borrowing** and spending, potentially helping to curb inflation.
 - **Stem Capital Flight:** The RBI aims to **prevent further outflow of capital from India** by making domestic investments more attractive

➤ Stock Market Fluctuations:

- As **investors chase higher US returns**, the Stock Indian stock market might experience:
 - **Decreased Demand:** Reduced foreign investment can lead to **lower demand for Indian stocks**, potentially causing a decline in their prices.

➤ Increased Debt Burden:

- A **weaker rupee** can make it **more expensive for India to service its external debt**, which is mostly denominated in US dollars. This can:
 - **Strain Public Finances:** The government may need to spend more to pay off its debts, impacting other crucial developmental plans.

➤ Benefits for Banks:

- The **banking industry gets benefits** from the interest rates rise, as banks re-price their loan portfolio much quicker than their deposit rates, which helps them to increase their net interest margin.

How can India Reduce the Impact of the US Federal Reserve Decisions on its Economy?

➤ Balancing Interest Rates:

- **Raising Rates:** The **Reserve Bank of India (RBI)** can replicate the US Fed's hike to:
 - **Attract Foreign Investment:** Higher interest rates can make **Indian bonds and other investments more attractive** to foreign investors, potentially increasing **demand for the rupee** and **stabilizing its value**.
 - **Control Inflation:** Increased interest rates can **deter borrowing and spending**, potentially aiding in the control of inflation, particularly when coupled with a depreciating rupee.

Note:

- **Diversifying the Reserve Basket:**
 - **Reducing Dollar Dependence:** India can diversify its foreign exchange reserves by increasing holdings of other major currencies like the Euro, Yen, or Yuan.
 - This reduces India's vulnerability to **US dollar fluctuations**. However, managing a diversified reserve basket can be complex.
- **Expanding Trade Horizons:**
 - **Exploring Export Markets:** Identifying and entering new markets for Indian exports can help diversify India's trade base and reduce its reliance on US markets.
 - **Trade Agreements:** Negotiating bilateral trade agreements with other countries can reduce trade barriers and boost trade flows with non-US countries.
- This reduces dependence on the US Dollar.
- **Stimulating Domestic Consumption:**
 - **Boosting Demand:** If the **US Fed** hike slows down the economy, the government can implement measures to encourage domestic consumption:
 - **Tax Cuts:** Reducing taxes can put more money in people's pockets, potentially increasing spending and stimulating economic activity.
- In 2020, the Indian government increased the tax rebate for income tax payers in the lower tax brackets. This aimed to boost consumption spending during the COVID-19 pandemic.
 - **Subsidies:** Targeted subsidies for essential goods and services can help ease the burden on consumers and maintain purchasing power. **Public Distribution System (PDS), Pradhan Mantri Ujjwala Yojana (PMUY)** are examples of such governmental initiatives.
- **Reducing Reliance on Oil:**
 - **Embracing Renewables:** A strong dollar often leads to higher oil prices. India can mitigate this by investing in solar, wind, and other renewable energy sources.

It can reduce dependence on imported oil and shield the economy from oil price fluctuations.

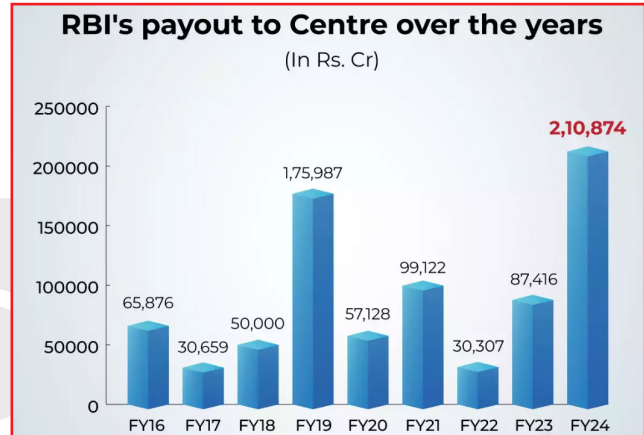
 - **Exploring Biofuels:** Developing biofuels like ethanol can provide an alternative fuel source, reducing reliance on imported oil.

RBI Surplus Transfer to Government

Why in News?

The **Reserve Bank of India (RBI)** has approved a significant **surplus transfer of Rs 2.11 lakh crore to the Central Government** for the accounting year 2023-24.

- This transfer marks a substantial increase from the previous year's dividend, showcasing a notable rise in surplus income.



How does the RBI Determine the Allocation of Dividends?

- The surplus calculation was based on the **Economic Capital Framework (ECF)** recommended by the **Bimal Jalan committee**, which advised the RBI to maintain a **Contingent Risk Buffer (CRB)** between 5.5% and 6.5% of its balance sheet.
 - This risk provisioning is made primarily from retained earnings and **only then is the surplus income transferred to the government as dividends.**
 - This range includes provisions for **monetary and financial stability risks as well as credit and operational risks.**
 - RBI transfers its surplus, which is the excess of income over expenditure, to the government as per **Section 47 of the Reserve Bank of India Act, 1934.**
- **Reasons for the Increase in RBI's Surplus:** As of March 2024, the RBI had USD 646 billion in **foreign exchange reserves**, with USD 409 billion parked in top-rated sovereign securities.
 - The RBI's gross dollar sales were lower in FY24 (USD 153bn) compared to FY23 (USD 213 bn).

Note:

- Despite lower dollar sales in FY24 compared to FY23, the RBI's management of foreign currency assets ensured continued high revenue.
- Income from **Liquidity Adjustment Facility (LAF)** operations also contributed to the overall surplus.

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

Bimal Jalan Committee Recommendations

➤ Formation:

- The RBI in 2018 constituted a six-member committee, **chaired by former governor Dr Bimal Jalan**, to review the current **economic capital framework (ECF)**, after the Ministry of Finance asked the central bank to follow global practices.

➤ Recommendations:

- The panel proposed a clear separation of **RBI's economic capital into two parts: Realised equity and Revaluation balances.**
 - Revaluation reserves include unrealised gains/losses in foreign currencies, gold, securities, and a contingency fund.
 - Realised equity, or CRB, is funded by retained earnings to cover risks and losses.
- The committee suggested that the RBI should maintain a **CRB within the range of 6.5% to 5.5% of the RBI's balance sheet.**
 - This would provide an adequate buffer against market risks, credit risks, and operational risks.
- The committee recommended that the **RBI should transfer its surplus funds to the government only after maintaining the CRB** within the suggested range.
 - This would ensure that the RBI's financial resilience is not compromised while supporting the government's fiscal needs.
- The panel also suggested that the **RBI's ECF should be reviewed every five years.**

Note:

- The RBI Board's technical Committee, led by **Y H Malegam in 2013**, recommended a **higher transfer of reserves and surplus to the government**, which typically averages around **0.5% of the Gross Domestic Product (GDP)** with a few exceptions.

Note:

Consumption Comparison of India-China

Why in News?

In 2023, India became the world's most populous country (with a population of around 1.44 Billion), surpassing China. It has significant **consequences on domestic consumption in the two countries.**

- This was due to China's declining **birth rate** (6.4 births per 1,000 people) and **total fertility rate (~1%)**, leading to a **negative population growth rate** for the first time in six decades. As a result, China is facing a **rising dependency ratio.**
- In contrast, India's population is expected to continue growing and reach its peak around 2060, despite reaching **replacement levels** with a **total fertility rate of 2.1.**

United Nations Department of Economic and Social Affairs (UNDESA)

- It was formed in 1948. It is a **pioneer of the Sustainable Development Goals (SDGs).**
- It brings the global community together to **work towards common solutions to the world's most pressing problems.**
- It helps countries translate their **global commitments into national action** in the economic, social and environmental spheres.

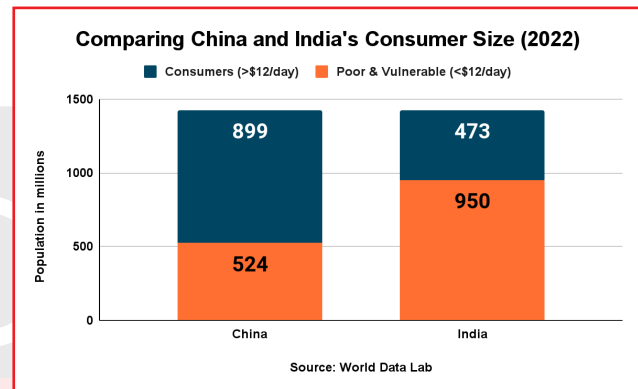
Key Terms

- **Birth Rate:** It is a demographic measure that indicates the **number of live births occurring during a given year per 1,000 people** in a population.
- **Total Fertility Rate (TFR):** It is the **average number of children a woman would be expected to have over her lifetime**, given current age-specific fertility rates.
 - Unlike the **birth rate**, which is a **measure of births per 1,000 people in a population per year**, the TFR provides a broader perspective on reproductive behaviour and potential population growth.
- **Dependency Ratio:** It compares the proportion of **individuals who are typically not in the labour force (dependents)** to those who are **usually in the labour force (the working-age population).**

- **Replacement Level Fertility:** It refers to the **number of children a woman needs to have in order to replace herself and her partner**, ensuring that the **population size remains stable** from one generation to the next, without considering migration.
 - The commonly cited figure for replacement level fertility is approximately **2.1 children per woman.**

What are the the Consumption Comparison Between Indian and China?

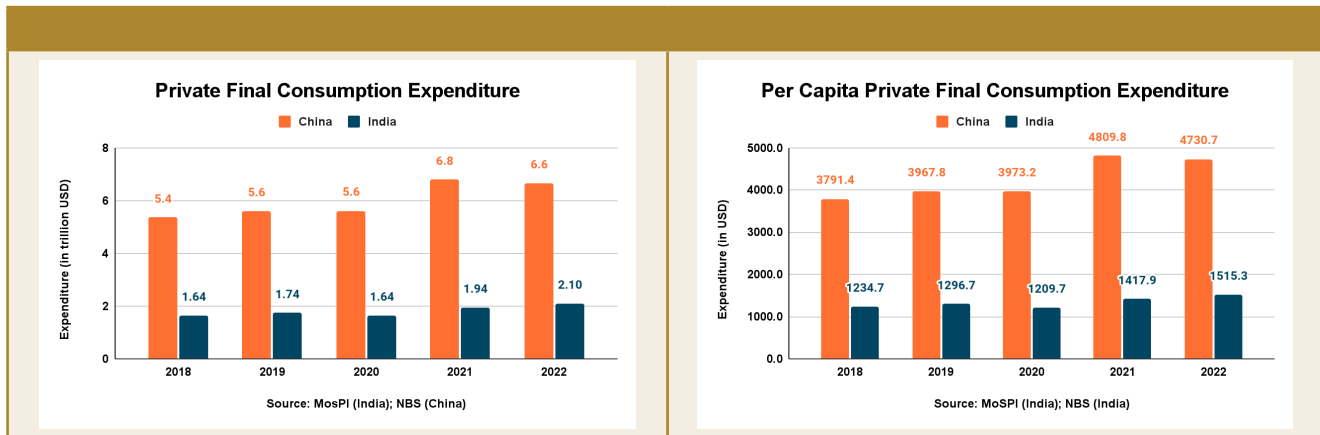
- **Consumer Size:**
 - Both India and China have a large consumer base. A consumer is anyone who spends more than **USD12 a day**, as per the **Purchasing Power Parity (PPP).**



- **Addition to Consumer Base:**
 - According to the **World Data Bank**, China's consumer base increased by 31 million in 2024, whereas India saw an addition of 33 million consumers.
 - Projections for 2025 suggest that China will add 32 million consumers, while India is expected to add 34 million.
- **Private Final Consumption Expenditure (PFCE):** It contributes more than **58% to India's GDP**, while it contributes only **38% to China's economy.**
 - **PFCE** is a major component of India's **Gross Domestic Product (GDP)** and reflects consumer spending, which is a critical driver of economic activity.
 - **PFCE** is a key economic indicator that measures the total value of all goods and services consumed by **households and non-profit institutions serving households (NPISHs)** within a country during a specific period.
 - **NPISHs** are organisations that provide non-commercial services to individuals and families. Examples include religious institutions, charities, and social clubs.

Note:

- **Final consumption**, including government consumption expenditure, constitutes **68% of India's GDP** and **53% of China's GDP**.
 - This implies that the government is a much bigger consumer in China than in India.
 - **Final Consumption Expenditure (FCE)** is obtained by adding **Government Expenditure** and **Private Final Consumption Expenditure (PFCE)**.
- The **percentage of consumption expenditure** is steadily increasing in India, while it has been on a decline in China.



➤ **Differences in Consumption Patterns and Economic Development:** India spends a higher proportion of their income on consumption.

- China's economic size (**USD 17.8 trillion**) is around **5 times** that of India's (**USD 3.5 trillion**) in **Nominal terms** and **PPP terms**, China's GDP is approximately **2.5 times of India's**.
- In **Nominal terms**, China's PFCE (USD 6.6 trillion) is only about **3.5 times** higher than India's (USD 2.1 trillion) and in **PPP terms**, China's PFCE is approximately **1.5 times** that of India.
- Thus, consumption plays a more significant role in India's GDP compared to China.
- **India will reach the same level of consumption as China at a much lower GDP figure** (around USD 10 trillion for India compared to USD 17 trillion for China in nominal terms).

➤ **PFCE Trends between 2018 and 2022:**

- **China's consumer spending has grown significantly in the past four years** (USD 5.4 trillion in 2018 to USD 6.6 trillion in 2022), despite concerns.
 - On the other hand, **India's figures have steadily increased** from USD 1.64 trillion in 2018 to USD 2.10 trillion in 2022.
- **In 2022, China's spending went down slightly**, both overall (from USD 6.8 trillion to USD 6.6 trillion) and per person (from USD 4,809 to USD 4,730).

Meanwhile, **India's spending inched up in both categories.**

- The **difference in the expenditure** between the two countries has **widened** from **USD 3.8 trillion in 2018** to more than **USD 4.5 trillion in 2022**.

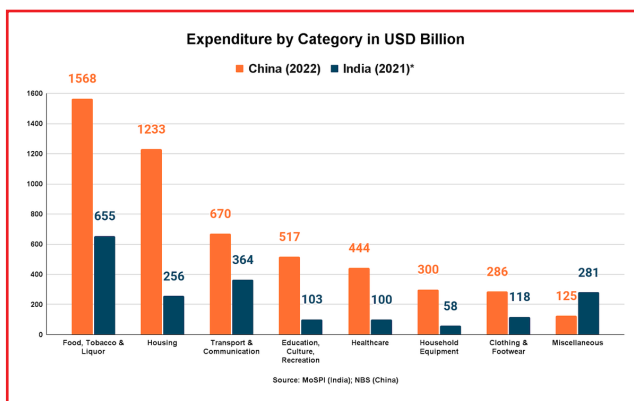
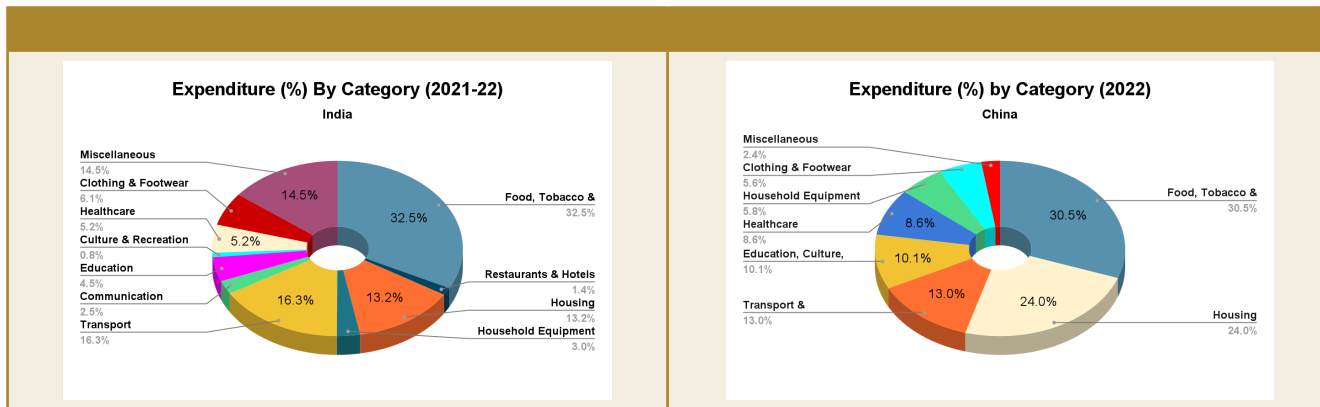
➤ **Expenditure by Categories:**

- **Indian consumers allocate a larger portion of their spending towards basic needs** like food, clothing, footwear, and transportation.
 - This spending pattern reflects a **developing economy** where households **prioritise necessities over discretionary spending**.
- On the contrary, **China's consumption basket reflects a market that is relatively advanced**.
 - While **food and beverages make up the largest portion of China's consumption**, their share of total consumption expenditure is **decreasing**, indicating a market that is becoming more mature.
 - Also, it spends a **larger proportion of its budget on housing**, white goods, recreation, education, and healthcare compared to India.
 - In advanced economies like the **US, Japan, EU, Germany, and the UK**, food expenditure is **not** the highest category.
- **India spends about half as much as China on food, transport, communication, and clothing**. Even though India's economy is only one-fifth the size of China's,

Note:

the total expenditure in these sectors represents a similar percentage of their respective economies.

- As per **Monthly Per Capita Consumption Expenditure (MPCE)** report, both in rural and urban areas of India, the **share of food in total expenses reduced and that in non-food expenses increased in 2022-23** compared with 2011-12.



What are the Factors Responsible for Difference in Consumption Pattern between India and China?

➤ Demographic Dividend:

- According to the **World Bank** Report, as of 2022, the **median age in India is 28.4 years** compared to **China's 38.4 years**.
 - A younger population is likely in its early career stages, with rising income and a greater tendency to spend on establishing a household (housing, durables, transportation).

➤ Income Levels and Disposable Income:

- **China has a larger and more established middle class** with higher disposable incomes, enabling greater spending beyond essentials.
- In contrast, **India's middle class is smaller**, with more income directed towards basic necessities like food and transportation, resulting in less discretionary spending.

- **Gross National Income(GNI) per capita** in China for the year 2022 was USD 12,8501 and in India USD 2,5473.

➤ Stage of Economic Development:

- India is categorised as a **Lower-middle-income country** and China as an **upper-middle-income country** according to the **World Bank** .
- **China's economy has transitioned from agriculture to manufacturing** and then to services, driven by rapid industrialization, export-oriented growth, and infrastructure investment.
- **India has moved more directly from agriculture to services**, with significant growth in IT, finance, and professional services, while its **manufacturing sector is still developing**.

➤ Access to Credit:

- According to World Bank data, **China has a much higher level of credit penetration** compared to India.
 - Nearly **half of the adult population in China has a credit card**, while only around 12% do in India.
- A significantly larger portion of the **Chinese population (over 85%) has access to loans** from financial institutions compared to India (around 57%).

➤ Urbanisation:

- While **urbanisation is increasing in India**, it **lags behind China**. This limits the reach of **discretionary products** and keeps consumption patterns focused on necessities.

Note:

- In 2020, 63.8% of China's population was urban, compared to 34.5% of India's population, according to the World Bank.

Indian Manufacturing Needs Product Sophistication

Why in News?

Recently, the **Finance Minister** stated that the Indian manufacturing sector should focus on developing more sophisticated products, and the government is ready to provide policy support to achieve this goal.

What is the Status of India's Manufacturing Sector?

- The **manufacturing sector** contributes **17% of India's GDP** and employs over **27.3 million workers**, playing a significant role in the country's economy.
 - The Indian government **aims to increase** the manufacturing sector's contribution to **25%** of the economy's output by **2025** (goal of **Make in India**).
- The increasing significance of manufacturing is driven by the strong performance of important sectors such as **automotive, engineering, chemicals, pharmaceuticals, and consumer durables**.
- **Manufacturing exports** reached a record high of **USD 447.46 billion** in FY23, showing a **6.03%** growth compared to the previous year (FY22) when exports were USD 422 billion.
- **India's key industrial sectors (8 core industries)** saw a slowdown in January 2024, experiencing their slowest growth in 15 months. Growth slipped to 3.6%, a significant decline from December 2023 (4.9%) and January 2023 (9.7%).
- The **Index of Industrial Production (IIP)** from April-October 2023 stood at **143.5**, which signifies a growth of **43.5% compared to the base year (2011-12)**.
 - IIP is a composite indicator of the general level of industrial activity in the economy. It is calculated and published by the **Central Statistical Organisation (CSO)** every month.
- **Capacity utilisation** for the manufacturing sector increased to **68.3%** in Q2 (2021-22) from 60.0% in the previous quarter due to the easing of the second wave of the **Covid-19** pandemic.

- **Capacity utilization** refers to the manufacturing and production capabilities that are being utilised by a nation or enterprise at any given time.
- Sectors like **Drugs and Pharmaceuticals (+46%)**, **Food Processing Industries (+26%)**, and **Medical Appliances (+91%)** witnessed increased **FDI inflows**.
- As per **the Economic Survey 2021-22**, in spite of **Covid**-related disruptions, there is a trend of positive overall growth of **Gross Value Addition (GVA)** in the manufacturing sector.
 - The total **employment** in this sector has increased from 57 million in the year 2017-18 to **62.4 million** in the year 2019-20.

What are the Opportunities for Manufacturing Sector in India?

- **Broad Domestic Market and Demand:** The Indian manufacturing sector has seen strong demand for their goods from both domestic and external clients.
 - **PMI** in May 2024 (**58.8**), shows expansion in India's manufacturing sector.
- **Sectoral Advantage:** Key manufacturing sectors in India, such as **chemicals, pharmaceuticals, automotive, electronics, industrial machinery, and textiles**, have experienced significant growth in recent years.
 - In India, pharmaceutical manufacturing costs are 30%–35% lower than US and Europe.
- **Outreach to the Market of Global South: As per the UN, Indian manufacturing is shifting in Global Value Chains (GVC) from Europe to Asia.** The share of foreign value-added (FVA) in India's domestic final demand from Global Southern partners rose from 27% in 2005 to 45% in 2015.
 - This shift presents opportunities for Indian firms to establish their own GVCs and for **India to become a regional growth pole**.
- **Rise of MSME:** MSMEs currently contribute approximately 30% to **GDP**, playing a crucial role in driving economic growth and contributing nearly **45% of India's total exports**.
- **Robust demand:** India's manufacturing products are experiencing **rising demand**, both domestically and internationally.
 - The manufacturing sector of India has the potential to reach **USD 1 trillion by 2025**.

Note:

- **Competitive Advantage:** Growth in India's manufacturing sector, driven by increased production capacity, **cost advantages, supportive government policies, and private investment**, is setting the stage for sustained economic growth in the coming years..

Government Policy for the Manufacturing Sector

- **Make in India 2.0**
- **PLI schemes**
- **Liberalised foreign direct investment (FDI)**
- **Start-up India**
- **Atmanirbhar Bharat Campaign**
- **Special Economic Zones**
- **MSME Innovative Scheme**
- **Ease of Doing Business**
- **Goods and Services Tax (GST)** and Reduction in **Corporate tax**

What are the Challenges to the Manufacturing Sector in India?

- **Reliance on outdated technology and inadequate infrastructure** hinders the ability of Indian manufacturers to compete globally and meet international quality standards.
- **Shortage of Skilled Workforce:** As per **World Bank**, only **24%** of India's workforce possesses the skills required for complex manufacturing jobs in contrast to 52% in the US and 96% in South Korea.
- **High Input Cost:** As per **RBI (2022)** states that **logistics costs** in India are **14%** higher compared to the global average which impacts the overall competitiveness of Indian manufacturing industry.
- **Complex Regulatory Environment:** It acts as deterrent for businesses looking to set up manufacturing units in India.
 - Land Acquisition is a complex process in India, **NITI Aayog** suggests Land Titling Act yet to pass by legislature.
- **Competition from China and Import Dependence:** In 2023-24, **China accounted for almost 42% of India's textiles and clothing imports**, 40% of machinery, and 38.4% of electronics imports.
 - As per **WTO**, China remains the world's leading manufacturer, accounting for nearly **30%** of global manufacturing output in 2022.

Regional Economic Outlook for Asia And Pacific Report: IMF

Why in News?

Recently, the **International Monetary Fund (IMF)** has released its **Regional Economic Outlook for Asia And Pacific Report** April 2024, which stated that India was the source of repeated positive growth surprises, supported by resilient domestic demand. Also, **Public Investment** is a significant factor in driving India's economy.

What are the Key Highlights of the Report?

- **Growth in Asia-Pacific:** Asia-Pacific's growth in late 2023 surpassed expectations at 5.0%, with varying inflation rates across economies.
 - Projections for 2024 suggest a **slight growth slowdown to 4.5%**, balancing near-term risks.
 - In emerging markets, growth was supported primarily by strong private demand.

Economic forecasts: Asia and the Pacific

(real GDP growth; year-over-year percent change)

	PROJECTIONS			CHANGE FROM OCT 2023 WEO	
	2023	2024	2025	2024	2025
Asia	5.0	4.5	4.3	0.3	0.0
Advanced economies	1.7	1.6	1.8	-0.1	0.2
Australia	2.1	1.5	2.0	0.3	0.0
Hong Kong SAR	3.2	2.9	2.7	0.0	-0.2
Japan	1.9	0.9	1.0	-0.1	0.4
Korea	1.4	2.3	2.3	0.1	0.0
New Zealand	0.6	1.0	2.0	0.0	-0.1
Singapore	1.1	2.1	2.3	0.0	-0.2
EMDEs	5.6	5.2	4.9	0.4	0.0
Bangladesh	6.0	5.7	6.6	-0.3	0.0
Brunei Darussalam	1.4	2.4	2.5	-1.1	-0.3
Cambodia	5.0	6.0	6.1	-0.1	-0.3
China	5.2	4.6	4.1	0.4	0.0
India	7.8	6.8	6.5	0.5	0.2
Indonesia	5.0	5.0	5.1	0.0	0.1
Lao P.D.R.	3.7	4.0	4.0	0.0	-0.1
Malaysia	3.7	4.4	4.4	0.1	0.0
Mongolia	7.0	6.5	6.0	2.0	2.5
Myanmar	2.5	1.5	2.0	-1.1	-0.5
Nepal	0.8	3.1	5.2	-1.9	0.0
Philippines	5.6	6.2	6.2	0.3	0.1
Thailand	1.9	2.7	2.9	-0.5	-0.2
Vietnam	5.0	5.8	6.5	0.0	-0.4
Pacific island countries	3.3	4.0	3.5	0.2	0.0

Sources: IMF, World Economic Outlook database; and IMF staff calculations.
Note: EMDEs = Emerging markets and developing economies. EMDEs exclude Pacific island countries and other small states. India's data are reported on a fiscal year basis. Its fiscal year starts from April 1 and ends on March 31. Pacific island countries aggregate is calculated using simple average, all other aggregates are calculated using weighted average.

IMF

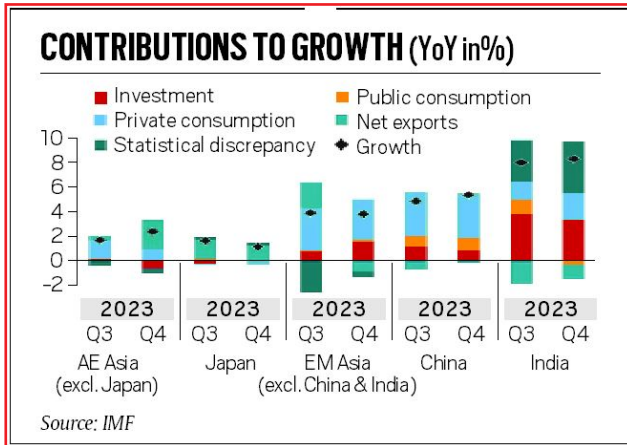
- **India's Growth Forecasts:** It raised India's growth forecast for the financial year **2024-25 to 6.8%** from 6.5% earlier and retained the growth forecast for **2025-26 at 6.5%**.

Note:



drishti

- It stated that **India and the Philippines** have been the source of repeated positive growth surprises, supported by **resilient domestic demand**.
- In China and, especially, **India, public investment made an important contribution**.



- **Forecast for China:** The Chinese Economy is expected to grow at the rate of **4.6%** in 2024, slower from 5.2% in 2023 and expected to remain at 4.1% in 2025.
 - The IMF sees China as a source of both upside and downside risks.
 - Policies addressing stresses in the **property sector** and **boosting domestic demand** will benefit China and the region, as this sector is under stress due to concerns about a potential **housing bubble** (rapid rise in prices) and **high levels of debt**.
 - However, sectoral policies leading to excess capacity in certain industries, such as **steel and aluminium**, will harm China and the region.
- **Inflation Forecast:** The IMF stated that **inflation** is currently at or near the desired level in emerging markets, but there are different factors contributing to inflation in the future.
 - **Core inflation** is expected to stay low, but some economies may see a decrease in **headline inflation** due to lower energy prices.
 - However, in countries like **India, food prices**, particularly for rice, can increase **headline inflation**.
 - **Inflation**, as defined by the **International Monetary Fund**, is the **rate of increase in prices** over a given period, encompassing a broad measure of overall price increases or for specific goods and services.

- **Headline Inflation:** It considers the price changes of all the goods and services. This basket includes everything from food and energy to clothing, rent, and entertainment.
- **Core Inflation:** This is change in price of goods and services **excluding food and energy** sectors (as they are volatile).
- **Core Inflation= Headline Inflation- Food and Fuel Items**
- **Geoeconomic Fragmentation:** IMF has highlighted **Geoeconomic fragmentation** as a significant risk.
 - Geoeconomic fragmentation refers to the **risk of increasing economic and trade tensions between countries**, which can have negative impacts on global economic growth and stability.
 - Global disputes increase the trade risks, as shown by ships being redirected around Africa to bypass the **Red Sea**, leading to higher shipping expenses.
 - IMF suggested that policymakers should be cautious to not aggravate trade frictions themselves.

How Public Investment is Key to Growth of India?

- **About: Public investment** refers to the allocation of government funds towards critical sectors such as infrastructure, education, healthcare, and technology.
 - It plays a pivotal role in shaping a nation's economic trajectory.
- Public Sector as Key to India's Growth:
 - **Infrastructure Development:** Public investment is vital for building and maintaining critical infrastructure, such as roads, highways, railways, ports, airports, and power plants, which are essential for economic growth and productivity.
 - This sector will require estimated investments of **USD4.5 trillion by 2030**, which underscores the need for increased public investment in this sector.
 - **Job Creation and Poverty Alleviation:** Public investment in infrastructure projects, social welfare schemes, and rural development initiatives can create employment opportunities and contribute to poverty alleviation.
 - The **Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)**, for instance, has generated billions of person-days of employment since its inception.

Note:



- **Human Capital Development:** Public investment in education, healthcare, and skill development is crucial for building a skilled and productive workforce, which is essential for sustained economic growth.
 - Also, public investment ensures balanced development across regions. It reduces disparities and promotes inclusive growth.
- **Crowding-in Private Investment:** Public investment in infrastructure and other productive sectors can create a favourable environment for private investment by **reducing the cost of doing business** and enhancing overall productivity.

What is IMF?

- **About:** The International Monetary Fund (IMF) is an international organisation that provides financial assistance and advice to member countries.
 - It was conceived during the **Bretton Woods Conference** in **July 1944**.

HOW MANY COUNTRIES ARE IMF MEMBERS?	700 19th St NW, Washington, DC 20431	HOW MUCH MONEY DOES THE IMF HAVE TO LEND?	Most money comes from its members who contribute based on their size and economic position
190 member countries	WHERE IS THE HEADQUARTERS OF THE IMF?	About SDR 707 billion, or around US \$1 trillion	WHERE DOES THE IMF GET ITS MONEY?

- **Objectives:**
 - Foster global monetary cooperation and stability.
 - Ensure financial stability and provide crisis assistance.
 - Facilitate international trade with stable currencies.
 - Promote sustainable growth and employment through effective policies.
- **Board of Governors:** The **Board of Governors** of the IMF includes one Governor and one Alternate Governor from each member country.
- In the case of India, the **Finance Minister** serves as the **ex-officio Governor** on the Board of Governors, and **Governor of the Reserve Bank of India** acting as India's Alternate Governor.
- **Special Drawing Rights:** The IMF issues an international reserve asset known as **Special Drawing Rights**, that can supplement the official reserves of member countries.

- Total global allocations are currently about **USD 293 billion**. IMF members can voluntarily exchange SDRs for currencies among themselves.
- Reports Published by IMF:
 - [World Economic Outlook \(WEO\)](#)
 - [Global Financial Stability Report \(GFSR\)](#)
 - Fiscal Monitor (FM)
 - [Regional Economic Outlooks](#) What is the Significance of the IMF for India?
- **About:** India joined the IMF as a founding member in **December 1945**, even before gaining independence.
 - Currently, India holds a **2.75% Special Drawing Rights** quota and 2.63% of votes in the IMF.
 - **SDR** is one of the components of the **Foreign Exchange Reserves (FER)** of India
- **IMF** has made an allocation of Special Drawing Rights 12.57 billion to India. (approx USD 17.86 billion).
- **Significance:**
 - **Independence of the Indian Rupee:** Before the establishment of the IMF, the **Indian rupee was linked with the British Pound Sterling**.
 - But the Indian rupee has become independent after the establishment of the IMF. Its value is expressed in terms of gold.
 - It means that the Indian rupee is easily convertible into the currency of any other country.
 - **Availability of Foreign Currencies:** The Government of India has been purchasing foreign currencies from the Fund from time to time to meet the requirements of development activities.
 - From the inception of the IMF up to **31st March, 1971**, India purchased foreign currencies of the value of Rs. 817.5 crores from the IMF, and the same have been fully repaid.
 - Since 1970, the assistance that India, as other member countries of the **IMF**, can obtain from it has been increased through the setting up of the **Special Drawing Rights** (SDRs created in 1969).
 - **Help During Emergency:** India has got a large amount of financial assistance from the Fund to solve its economic crisis arising due to natural calamities like flood, earthquakes, famines etc.
 - In 1981 India was able to procure a massive loan of Rs. 5000 crores from IMF to overcome the **balance of payments** problem faced by it.

Note:

Which Sunrise Sectors in India are Seeking Substantial Public Investments?

- **Carbon Capture, Utilization, and Storage (CCUS):** **CCUS** technologies can play a crucial role in mitigating greenhouse gas emissions, particularly from industries like steel, cement, and power generation.
 - However, public investment in research, development, and deployment of CCUS projects in India is currently limited.
- **Cybersecurity and Data Protection:** With the increasing **digitalization of the economy** and the rise of cyber threats, public investment is needed to enhance India's cybersecurity infrastructure, develop robust data protection frameworks, and build a skilled workforce in this domain.
- **Biotechnology and Precision Medicine:** Public investment in **biotechnology** research, particularly in areas like **genomics, synthetic biology, and precision medicine**, can help India develop cutting-edge healthcare solutions and position itself as a leader in this field.
- **Circular Economy and Waste Management:** While some initiatives have been taken, more public investment is required to develop a comprehensive **circular economy** framework, including infrastructure for waste collection, recycling, and resource recovery.
- **Blue Economy and Marine Research:** With India's vast coastline, public investment in marine research, sustainable ocean exploration, and the development of a blue economy focused on sectors like **offshore wind energy, marine biotechnology, and coastal tourism** could unlock significant economic opportunities.

India's Target of USD 1 Trillion Goods Exports by 2030

Why in News?

Recently, the commerce Ministry has initiated an exercise to **identify required infrastructure needs, potential sectors, and clusters** which would help the country achieve the USD 1 trillion merchandise exports target by 2030.

- However, a major future challenge lies in ensuring sustainable practices throughout the supply chain. This comes in the backdrop of another environmental

law passed recently by the **European Union (EU)** - **Corporate Sustainability Due Diligence Directive (CSDDD)**.

What is the Current Status of India's Exports?

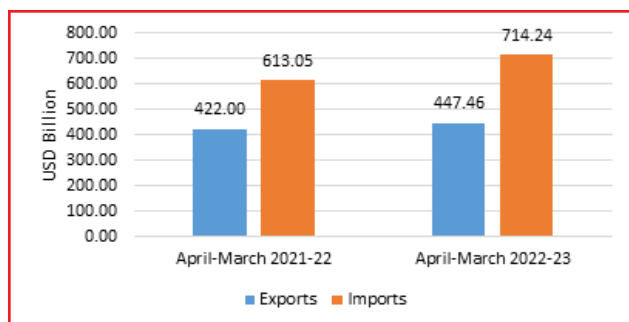
- The **Foreign Trade Policy (FTP) 2023** aims to boost **India's exports to USD 2 trillion by 2030**. It focuses on emerging **areas of export**, such as **high-tech manufacturing, pharmaceuticals, and e-commerce**.
- India's **merchandise exports** increased from **USD 314 billion** in 2013-14 to **USD 451 billion** in 2022-23, growing at an **average annual rate of 5%**.
- In terms of **export destinations** for Indian goods and services, the **United States** and the **United Arab Emirates (UAE)** have remained key markets, with India diversifying in terms of export destinations to Bangladesh, Indonesia and the Netherlands.
 - However, **India's trade deficit** has more than doubled in the last decade, reaching **over USD 50 billion in 2022-23**.

What are the Emerging Sustainability Related Hurdles for Indian Exports?

- **Stricter Environmental Regulations in Importing Countries:**
 - Indian exporters, like those in sectors like **textiles industry** (water-intensive cotton and jute farming) and others, might struggle to comply with these evolving regulations if they don't adopt sustainable practices.
 - **Example:** The **European Union (EU)** recently passed the **Corporate Sustainability Due Diligence Directive (CSDDD)**.
 - This law requires companies operating in the EU to ensure their **entire supply chain** (from raw material sourcing to production) adheres to **environmental regulations** and follows sustainable practices.
- **Growing Consumer Demand for Sustainable Products:**
 - Indian exporters in sectors like apparel, footwear, or home goods can lose market share if their products **aren't perceived as sustainable**. Consumers might choose alternatives from competitors with a stronger sustainability focus.
 - **Example:** Globally, consumers are **increasingly choosing eco-friendly** products. Fashion brands are facing pressure to **use recycled materials** like organic cotton or polyester.

Note:

- **Supply Chain Transparency Requirements:**
 - Indian exporters who **cannot demonstrate a transparent and sustainable supply chain** may face difficulties accessing some export markets.
 - **Example:** Many countries are demanding greater transparency in supply chains. This means ensuring **ethical labour practices** (fair wages, safe working conditions) and **environmentally responsible sourcing** throughout the production process.
- **Carbon Pricing Mechanisms:**
 - Indian exporters, particularly those in **heavy industries like steel or cement** production, may face **increased costs** due to their high carbon footprint. This could make their products less competitive in the global market compared to those with lower emissions.
 - **Example:** Groups like the **European Union (EU)** are implementing **carbon pricing mechanisms** like **Carbon Border Adjustment Mechanism (CBAM)** to reduce carbon emissions.
- **Lack of Infrastructure and Awareness:**
 - India might face challenges due to a lack of infrastructure for sustainable practices like **efficient waste management** or readily available **renewable energy sources**.
 - Additionally, there may be a need to raise awareness among businesses about the importance of sustainability and best practices to achieve it.



How does EU's Environmental Regulations Impact India's Export Targets?

- **Sustainability Issues for India's Export:**
 - India's major exports to the EU, such as **iron ore and steel**, are facing a significant threat due to the **carbon levies ranging from 19.8% to 52.7%**.

- The proportion of **coal-fired power in India is close to 75%**, which is much higher than the EU (15%) and the global average (36%).
- **Increased Costs and Compliance Burden:**
 - Over 1/4th of India's exports of iron, steel, and aluminium are destined for the European Union. However, industry fears that potential EU tariffs could increase the cost of these exports by **20 to 35%**.
 - Additionally, Indian companies will need to **implement stricter due diligence practices** throughout their supply chains. This could **involve audits, monitoring, and risk assessments** to ensure no forced labour or environmental damage occurs. These measures will likely add to operational costs.
- **Market Access Challenges:**
 - Companies that fail to comply with CSDDD standards may face difficulties exporting to the EU. The directive **allows for civil liability claims and potential exclusion** from the EU market for non-compliance.
- **Risk to Export Competitiveness:**
 - **CBAM**, initially, is likely to affect a few sectors but **may expand to other sectors** in the future, such as refined petroleum products, organic chemicals, pharma medicaments, and textiles, which are among the top 20 goods imported from India by the EU.
 - Since **India has no domestic carbon pricing scheme** in place, this poses a greater risk to export competitiveness, as other countries with a carbon pricing system in place might have to pay less carbon tax or get exemptions.

What Steps Can Be Taken By India To Counter the Sustainability Related Hurdles?

- **Global Supply Chain (GVC) Integration:**
 - India needs to increase its presence in the vast network of **global supply chains**, which account for 70% of global trade, is a significant growth opportunity.
 - Cross-country estimates suggest that a **1% increase in GVC participation can boost per-capita income by more than 1%**, particularly when countries engage in limited and advanced manufacturing.

Note:

➤ Infrastructure Boost:

- India should focus on upgradation of ports, airports, and railways is crucial to handle the projected surge in exports and imports.
- The Indian government has partnered with the **Asian Development Bank (ADB)** for collaboration that will identify promising sectors for export growth and pinpoint the necessary infrastructure upgrades to handle the projected \$2.5 trillion increase in total trade volume by 2030 - A step in the right direction.

➤ Voicing Collective Challenges :

- India should raise developing countries' collective challenges related to the CBAM and CSDDD in international forums like the **World Trade Organisation (WTO)**, asserting that it undermines the crucial principle of 'Common but differentiated responsibility.'
 - By imposing restrictions on the developing world's ability to industrialise, CBAM challenges the equity envisioned in international climate agreements.

➤ Consideration of Export Tax:

- As a strategic response, India is contemplating imposing a similar tax on its exports to the EU. While this could subject producers to a **comparable tax burden**, the **funds generated offer a unique opportunity to reinvest** in environmentally friendly production processes.
 - This not only **mitigates the impact of current taxes** but also positions India favourably for potential future reductions.
 - The success of this countermeasure hinges on navigating these uncertainties and securing international cooperation.

What are the Major Government Initiatives to Promote Export Growth?

- **Trade Infrastructure for Export Scheme (TIES)**
- **PM Gati Shakti National Master Plan (NMP)**
- **Duty Drawback Scheme**
- **Remission of Duties or Taxes on Export Product (RoDTEP)**
- **Rebate of State and Central Taxes and Levies**

Global Trade Update: UNCTAD

Why in News?

Recently, the **United Nations Conference on Trade and Development (UNCTAD)** has released its **Global Trade Update 2024**, which highlights that, after facing declines over several quarters, international trade is poised for a rebound in 2024.

- Recently, **UNCTAD** has officially rebranded as "UN Trade and Development" as part of its 60th-anniversary celebrations.
 - The organisation will **adopt its new name and logo** across all official channels, including communication materials in the **six official languages of the United Nations**.

What are the Key Highlights of the Global Trade Update?

- **2023 as a Challenging Year for Trade:**
 - Global trade dipped 3% to USD 31 trillion in **2023 after peaking in 2022**. The downturn was driven by **less demand in developed economies** and weaker trade in East Asia and Latin America.
 - The downturn was driven by a **5% fall in trade in goods**. Meanwhile, trade in services bucked the negative trend, growing by 8%.
 - The sector was fuelled by a **nearly 40% surge in tourism** and travel-related services.
- **Developing Countries Facing More Issues:**
 - Developing countries **experienced a sharper decline in trade**, with their imports and exports falling by **5% and 7%, respectively**, compared to a **4% drop in imports and 3%** in exports for developed nations.
 - Most regions saw **negative trade growth in 2023**. The exception was a significant increase in intra-regional trade in Africa.
- **Electric Cars Drove Trade in Environmental Goods:**
 - Despite the overall decline, 2023 saw a 2% rise in trade for environmental products, driven primarily by soaring **Electric Car** sales. E.g. Trade in electric vehicles grew by 60%.
- **End 2023 shows Signs of Stabilisation:**
 - The **final quarter of 2023 brought signs of stabilisation**, particularly in developing regions.
 - Most sectors saw a rebound, **although trade in apparel** (clothing and clothing accessories) continued to contract, **falling by 13%**.

Note:

➤ Looking ahead to 2024:

- The forecast for 2024 is broadly positive, with **GDP (Gross Domestic Product)** growth expected to continue at around 3%.
- However, the logistical challenges such as shipping disruptions in the **Red Sea, Black Sea** and **Panama Canal** cast shadows over the optimistic outlook, threatening to raise costs and disrupt supply chains.
- Ongoing geopolitical tensions and regional conflicts **could also renew volatility in energy and agricultural markets.**
 - Additionally, the growing need to secure access to minerals critical for the energy transition could affect prices and add to market volatility for these commodities.



➤ Political Proximity of Trade:

- During the last two years, the geographical proximity of international trade has remained **relatively constant**, showing minimal nearshoring or far-shoring trends.
- However, since the latter part of 2022, there has been a **noticeable rise in the political proximity of trade.**
- This indicates that bilateral trade patterns have been favouring trade between countries with **similar geopolitical stances.** Concurrently, there has been an increasing concentration of global trade to **favour major trade relationships, although** this trend has softened in the last quarter of 2023.

UNCTAD:

- **United Nations Conference on Trade and Development (UNCTAD)** is a permanent intergovernmental body of the United Nations.
- It was **established in 1964** and is **headquartered in Geneva, Switzerland.**

- It aims to promote **sustainable development**, particularly in developing countries, through **international trade, investment, finance, and technology transfer.**
- UNCTAD's work focuses on **four main areas:**
 - Trade and development,
 - Investment and enterprise
 - Technology and innovation
 - Macroeconomics and development policies.

What are the Key Highlights of the Report Related to India?

➤ Key Observations:

- Despite India's efforts to reduce dependency on China through the implementation of its flagship **Production-Linked Incentive (PLI) scheme** and **Quality Control Orders (QCOs)**, there was still an increase in imports from China.
- UNCTAD's estimates revealed a significant **trade reorientation** caused by the Russia-Ukraine conflict.
 - Russia's trade dependency on China increased by 7.1% and decreased by 5.3% with the EU, primarily due to a **shift in Russian oil exports** from the EU to China and India.

➤ Government of India's Stand:

- The **Ministry of Commerce and Industry** stated that although the growing trade dependence of India may seem negative, detailed analysis revealed **favourable trade dynamics.**
- **India's imports from the EU** rose by 9.7% in 2023, with a significant share consisting of capital goods (35% in 2022) and **intermediate goods and raw materials** (50% in 2022) used as inputs.
- India's **export of smartphones** have risen 98.42% in 2023 at USD 14.27 billion from USD 7.19 billion in 2022.
- Therefore, in 2023, India's trade performance significantly improved with the EU and China.

India's E-commerce Market

Why in News?

According to a recent report by **Invest India**, an Investment Promotion and Facilitation Agency, India's **E-Commerce Sector** is projected to reach **USD 325 billion by 2030.**

Note:

- This will position India as the **3rd largest** online retail market globally by scale.

What is the Status of the E-Commerce Sector in India?

- **About: E-commerce**, short for **Electronic Commerce**, encompasses the buying and selling of goods and services over the internet.
 - It eliminates geographical barriers, allowing transactions to occur seamlessly across borders.
 - It includes a wide range of activities, from online retailing to **digital payments**, and continues to evolve with advancements in technology and changes in consumer behaviour.
- **Types:**

Major Types of E-commerce

TYPE OF E-COMMERCE	EXAMPLE
B2C—Business to Consumer	Amazon.com is a general merchandiser that sells consumer products to retail consumers.
B2B—Business to Business	eSteel.com is a steel industry exchange that creates an electronic market for steel producers and users.
C2C—Consumer to Consumer	eBay.com creates a marketplace where consumers can auction or sell goods directly to other consumers.
P2P—Peer to Peer	Gnutella is a software application that permits consumers to share music with one another directly, without the intervention of a market maker as in C2C e-commerce.
M-commerce—Mobile commerce	Wireless mobile devices such as PDAs (personal digital assistants) or cell phones can be used to conduct commercial transactions.

- **Key Statistics:**
- Between 2019 and 2026, number of online shoppers in India will reach:
 - **88 million in Rural India**, showing a **Compound annual growth rate (CAGR) of 22%** and
 - **263 million in Urban India** showing a **CAGR of 15%**.
- In the fiscal year 2022-23, **Government e-marketplace (GeM)** achieved its highest-ever Gross Merchandise Value of **USD 2011 billion**.
- As of 2023, the e-commerce sector in India is valued at **USD 70 billion**, constituting approximately **7%** of the country's total retail market.
 - As of 2022, Top 3 countries in the e-commerce market are : **China, USA and Japan**.
 - As of 2022, India ranked **7th** in the e-commerce Market.
- **Driving Factors:**
 - **Smartphone and Digital Penetration:** The rise in smartphone usage has been a significant catalyst for e-commerce growth in India. It has democratised access to online platforms.

- **1.18 billion** people, representing over **80%** of India's population, will have access to smartphones **by 2026**.
- The **Unified Payments Interface (UPI)** has emerged as a significant player in digital transactions, facilitating transactions worth **USD 1.5 trillion in 2022**.
- **Affordability of Cheap Internet:** It plays a pivotal role in India's internet penetration.
 - Now one gigabyte of data is priced at approximately **USD 0.17 (Rs 13.5)**, which gives incentive to a substantial number of the population to opt for online activities
 - India ranks 7th on the list of countries with cheapest mobile data.
 - Also, **internet penetration** is expected to grow to **87% by 2025**.
- **Improved Logistics and Supply Chain:** The growth of e-commerce in India has been supported by the development of efficient logistics and supply chain networks.
 - Government initiatives such as the **National Logistics Policy** streamlines deliveries to the last mile, enhancing logistical efficiency and cost-effectiveness.
- **Rising Middle-Class Population and Disposable Incomes:** India's growing

Note:

middle-class population and increasing disposable incomes have fueled the demand for e-commerce.

- According to the World Economic Forum, nearly **80% of households in 2030 will be middle-income** in India.
- **Convenience and Time-Saving:** E-commerce offers consumers the convenience of shopping from the comfort of their homes or on-the-go, saving time and effort.
 - **Example:** Food delivery platforms like **Zomato and Swiggy** have gained immense popularity due to the convenience they offer to consumers, allowing them to order meals without leaving their homes or offices.
- **Wider Product Assortment and Competitive Pricing:** E-commerce platforms provide consumers with a vast array of product choices and competitive pricing options, making it easier to find desired products at affordable rates.
 - This has been a significant draw for consumers, particularly in smaller cities and rural areas **where product availability and pricing can be limited.**
- **Rising Focus on Rural E-Commerce:** Recent reports highlight the growing prominence of **Rural-Centric E-Commerce.**
 - It expects a significant portion of demand to originate from **tier 2-4 towns and rural areas by 2026.**
 - This trend is further reinforced by government initiatives and the emergence of quick commerce.
- **Challenges:**
 - **Counterfeit and Intellectual Property Infringement:** Cases of counterfeit and substandard goods being sold on popular e-commerce platforms have been reported in India.
 - It can undermine consumer trust and lead to legal and financial consequences for e-commerce companies.
 - **Infrastructural Challenges:** Internet penetration remains relatively low in certain areas. **Postal addresses are not standardised**, affecting logistics.
 - Due to lack of supply chain integration, high delivery charges, more time taken to deliver product
 - **Lack of Clear Regulatory Framework:** Clear legislation is needed to regulate e-commerce

practices domestically and internationally.

- The **rise of social commerce**, where consumers can make purchases directly through social media platforms, poses a potential challenge to the traditional regulatory framework.
- **Technological Disruptions and Cybersecurity Threats:** The e-commerce industry is susceptible to technological disruptions, such as the **emergence of new business models, advancements in artificial intelligence**, and cybersecurity threats like data breaches, hacking, and phishing attacks.
 - Customers are sceptical of paying by credit card due to the increasing **threat of fraud** by hackers

What are the Government Initiatives Related to the E-Commerce Sector in India?

- **FDI Policy:** 100% FDI is allowed in B2B e-commerce. Also, 100% FDI under the automatic route is permitted in the marketplace model of e-commerce.
- **National E-Commerce Policy:** The Indian government is set to introduce a national e-commerce policy that aims to create a favourable environment for the development of the sector and drive exports.
- **Key Features:**
 - **Aim:** Establish a regulatory framework that facilitates ease of doing business in the sector.
 - **Boosting Exports:** Recognizes India's significant e-commerce export potential. Aims to capitalise on global cross-border e-commerce growth.
 - **Regulatory Body and FDI:** Considers establishing a regulator for the e-commerce sector. Advocates for transparency in rules governing FDI.
 - **Addressing Trader Concerns:** Clarifies issues related to deep discounts and preferences given to select sellers.
- **Open Network for Digital Commerce (ONDC):** This initiative fosters an open-source e-commerce network that connects consumers, platforms, and retailers, promoting transparency and interoperability.
- It will provide equal opportunities for Micro, Small, and Medium Enterprises (MSMEs) to thrive in digital commerce.
- **The Consumer Protection (e-commerce) Rules, 2020.** The Rules directed the e-commerce companies to display the country of origin alongside the product listings.

Note:

- In addition, the companies will also have to reveal parameters that go behind determining product listings on their platforms.
- **Digital India initiative:** The **Digital India initiative** has provided solid impetus to other government-led initiatives, including **UMANG**, **Start Up India** and **Aatmanirbhar Bharat**, which have great potential to translate into global success.
- **India Stack:** This initiative comprises a set of open **APIs (Application Programming Interfaces)** that enable government agencies, businesses, and developers to leverage digital infrastructure for various services, including e-commerce.
- **BharatNet Project:** Aims to provide internet connectivity in local bodies (Panchayats), increasing e-commerce reach in rural areas.
 - Heavy investment is being made by the Government for rolling out a **fibre network for 5G** that will help boost e-commerce in India.

What Measures can be Adopted to Boost the E-Commerce Sector?

- **Robust Infrastructure Development:** Investing in improving logistical infrastructure, including transportation networks and warehousing facilities is needed to enhance last-mile delivery and reduce fulfilment costs.
 - Utilising **AI technology, data analytics and automation** to optimise logistics and supply chain management.
- **Strong Payment System:** As E-commerce heavily relies on online payment, it is necessary to build a secure payment system to build trust and facilitate transactions.
 - It is important to ensure that the payment gateway complies with the **PCI DSS** for security.
 - The **Payment Card Industry Data Security Standard (PCI DSS)** is a set of security standards designed to protect credit card data.
 - It is required by all organisations that process, store, or transmit credit card information.
- **Regulatory Framework for E-commerce:** It is needed to ensure that consumer rights are safeguarded through a clear framework, which includes accurate product descriptions, transparent pricing, fair return and exchange policies, and effective grievance redressal mechanisms.

- **Creating Awareness:** It is crucial to create awareness among people to promote and increase the growth of this industry.
 - It can be done through several ways such as:
 - **Education and training** can help in gaining a better understanding of the benefits and opportunities offered by e-commerce exports.
 - **Networking events** which can serve as a platform for businesses and individuals to connect and share ideas.
 - **Marketing campaigns** can also play a crucial role in creating awareness about e-commerce exports.

Employment Trends in India

Why in News?

India has been witnessing a **significant surge in employment** in recent years, with the creation of over **80 million additional jobs between 2017-18 and 2022-23**.

- This rapid growth has sparked a debate, with narratives emerging around the underlying causes and the sustainability of this trend.

What are the Key Trends in Employment Growth?

- **Historical Growth:** Analysis using **National Sample Survey Office (NSSO)** data from 1983 to 2023 shows consistent growth in principal employment across all sub-periods.
- **Consistent Growth: Principal employment**, which measures those working for the bulk of the year, has grown consistently since 1983.
 - Principal employment **refers to the main job worked for the majority of the year**, while subsidiary employment is **typically part-time, of shorter duration, and in addition to the main job**.
 - Every sub-period under consideration has seen growth in principal employment, with no instances of jobless growth.
- **Significant Increase (2017-2023):** The period from 2017-18 to 2022-23 saw the fastest increase, with about 80 million additional jobs, translating to an **annual growth rate of 3.3%**.

Note:



➤ Labour Market Indicators:

- Despite long-term deterioration since 2000, recent years have seen improvements in key labour market indicators such as **labour force participation rate**, **workforce participation rate**, and **unemployment rate**.
 - These improvements coincided with **economic distress periods, notably before and during the Covid-19 pandemic**.

➤ Broad-Based Growth: Employment growth has been well-distributed across rural and urban sectors, and various industries (**manufacturing, agriculture, construction, services**).

➤ Women and Older People: The employment growth has been highest for women, at over 8% annually.

- Employment among those **aged 60 and above has also grown at around 4.5% annually**.
- There are various reasons for this trend, including **increasing distress, improved access to resources like water and energy**, and greater flexibility in care-related work.
 - The employment of older people has been increasing since the 1980s, possibly due to longer lifespans.

➤ Employment Condition Index:

- The index is based on **seven labour market outcome indicators**, including the percentage of workers in regular formal work, casual labourers, self-employed workers below the poverty line, work participation rate, average monthly earnings of casual labourers, the unemployment rate of educated youth, and youth not in employment and education or training.
 - The "**employment condition index**" has improved between 2004-05 and 2021-22.
 - However, some states (**Bihar, Odisha, Jharkhand, UP**) have remained at the bottom throughout this period.
 - Other states (Delhi, Himachal Pradesh, Telangana, Uttarakhand, Gujarat) have stayed at the top.

How has Employment Quality Evolved?

➤ Rise in Informal Employment:

- Around 50% of jobs in the formal sector are **informal**.
- Approximately **82% of the workforce is engaged in the informal sector**.

➤ Nearly 90% are informally employed.

➤ Dominance of Self-Employment:

- A large part of the employment growth (44 million) is in the form of own-account workers and unpaid family workers.
 - This could be a result of government schemes like **Pradhan Mantri MUDRA Yojana (PMMY)**, which have provided significant funding to this segment

➤ **Self-employment** is the primary source of employment, constituting 55.8% in 2022.

➤ **Casual employment (hiring employees on a work-as-needed basis)** accounts for 22.7%, and regular employment for 21.5%.

What is the Trend in Wages and Salaries?

- Aggregate **wages** and salaries have seen relative stagnation in recent years.
- From 2017-18 to 2022-23, the average annual growth of salaries and wages was **6.6% in nominal terms but only 1.2% after accounting for inflation**.
- While there is no apparent wage distress, there is also no significant improvement in living conditions.
 - Possible reasons include the dampening of wages due to a large influx of workers and stagnating labour productivity.

What are the Trends in Youth Employment?

- **Youth employment and underemployment** increased between 2000 and 2019 but declined during the pandemic years.
 - However, unemployment among youths, especially those with **secondary-level or higher education, has intensified over time**.
- In 2022, the share of unemployed youths in the total unemployed population was 82.9%, and the share of educated youths among all unemployed people increased to 65.7% from 54.2% in 2000.
- The unemployment rate among educated youths was **six times greater for those with secondary education or higher (18.4%)** and nine times higher for graduates (29.1%) than for persons who could not read or write (3.4%) in 2022.
 - This was **higher among educated young women (21.4%) than men (17.5%)**, especially among female graduates (34.5%) compared to men (26.4%).

Note:

What are the Concerns Regarding Employment in India?

- **Growth of Informal Sector:** While the economy is growing, many new jobs are informal, lacking security, benefits, or minimum wage.
- **Quality of Jobs for Youth:** Though the unemployment rate might not be high, youth **employment is often of poorer quality.**
 - This means young people might be over-educated for the available jobs or find themselves in precarious situations like the **gig economy.**
 - Challenges for gig or platform workers include **lack of job security, irregular wages, and uncertain employment status.**
- **Gender Gap:** Women's participation in the workforce hasn't grown as expected. Many end up in unpaid family work or low-paying self-employment instead of formal jobs.
- **Skill Mismatch:** The **education system** might not be aligned with the current job market needs.
- **Formalisation Challenges:** A significant portion of the Indian workforce remains in the informal sector.
 - This translates to **lower tax revenue for the government and limited social security benefits for workers.**
- **Job Automation:** As with many countries, automation poses a threat to certain sectors in India. This can lead to job displacement in industries like manufacturing.
 - The rise of **artificial intelligence (AI)** may impact employment, particularly in the outsourcing industry in India, where some back-office tasks could be taken over by AI.
- **Vulnerability to Economic Shocks:** Many of the workforce relies on informal or casual employment. This makes them **highly vulnerable to economic downturns or external shocks**, as seen during the Covid-19 pandemic.
- **High Demand for Government Jobs:** There is a significant demand for government jobs due to the lack of job creation in the private sector.
 - This situation underscores the appeal of stable employment provided by the government.

Government's Initiatives Related to Employment

- **Support for Marginalised Individuals for Livelihood and Enterprise (SMILE).**
- **PM-DAKSH (Pradhan Mantri Dakshta Aur Kushalta Sampann Hitgrahi).**

- **Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA).**
- **Pradhan Mantri Kaushal Vikas Yojana (PMKVY).**
- **Start-Up India Scheme.**
- **Rozgar Mela.**
- **Indira Gandhi Urban Employment Guarantee Scheme- Rajasthan.**
- **Direct Benefit Transfer Scheme.**
- **Pradhan Mantri Mudra Yojana.**

Factors Shaping Global Gold Prices

Why in News?

A recent econometric study has found that there is a **direct relationship** between **crude oil prices and gold prices**, and an **inverse relationship** between the **value of the U.S. dollar and gold prices.**

What are the Major Findings of the Study?

- **Findings:** There is a **positive correlation** between global **Crude Oil price** and the international price of gold and a **negative correlation** between the external value of the U.S. Dollar and the International price of Gold .
 - In other words, when crude oil prices shoot up, prices of gold increase, and when value of the US Dollar increases, the price of gold decreases.
- **Reasons:** Rise in international **crude oil** prices lead to global **Inflation**, which leads to an increase in the demand for gold as a **Hedge** against **Inflation**, as gold is a real asset and not subject to loss of value.
 - Assuming other conditions are the same, when the U.S. dollar is strong, gold prices tend to remain low and steady.
 - However, if the **dollar weakens, demand for gold rises**, leading to an increase in its price.
 - This shift occurs because a strong dollar boosts confidence in its value, reducing the need for gold investment, while a weaker dollar prompts concerns about value loss, driving people towards gold as a safer asset.

What are the Factors that Affect Gold Prices Worldwide?

- **Gold Production:** On the supply side, the gold prices depend on its production and mining cost.

Note:

- Since most of the available gold has already been mined, new production will involve digging deeper into the earth, which is expensive.
 - So when the prices of **crude oil and natural gas** rise, it contributes to the rise in the price of gold.
 - Top 5 gold producing countries are: China, Australia, Russia, Canada and the US.
- **Demand by Central Banks:** Institutional demand, particularly from central banks, drives gold prices to record levels.
 - They purchase gold to strengthen reserve assets, given its **value retention**.
 - With **rising crude oil prices and geopolitical tensions**, central banks globally are increasing their gold reserves to mitigate risks associated with foreign currency reserves.
 - As of March 2024, the **Reserve Bank of India** held a total of **822 metric tonnes** of gold, with 408 metric tonnes held within the country.
- **Investor Demand:** Whenever **stock markets, real estate and bonds** fall across the world, investors turn to gold to park their funds.
 - It is considered as a safe haven for investors during periods of uncertainties because gold is highly liquid and carries no default risk.
 - Also individual and institutional investors like to invest in physical gold or their **financial derivatives** and **exchange traded funds (ETFs)** as a component of their investment portfolio with the aim of diversification of risk and safety of investment.
 - **Financial Derivatives** are a financial instrument which derives its value/price from the underlying assets.
- **Consumer Demand:** It arises from individuals as well as jewellers.
 - In both China and India, the largest consumers and importers of gold, it is bought as a **traditional store of wealth** and as **ornaments** for special occasions.
 - However, consumer demand is mostly seasonal.
- **Industrial Demand:** Industrial demand is influenced by **technology**. Gold as a metal is preferred by industry for its **intrinsic properties** like malleability and conductivity.
 - It is used in various industries such as:
 - In the **electronics industry** for its excellent conductivity and corrosion resistance. It's commonly found in connectors, circuit boards, and various electronic components.

- In **dentistry** for making crowns, bridges, and other dental prosthetics due to their biocompatibility and durability.
- In **aerospace applications**, such as coating spacecraft components and satellites, due to its reflective properties and resistance to corrosion in harsh environments.
- In **medical devices**, such as implants and diagnostic equipment, due to its biocompatibility and inertness within the human body.

What is the Status of the Gold Industry in India?

- **Gold Reserves in India:** As per **National Mineral Inventory**, total reserves/resources of gold ore in India estimated at 501.83 million tonnes as of 2015.
 - Largest resources of gold ore located in Bihar (44%), followed by Rajasthan (25%), Karnataka (21%), West Bengal (3%), Andhra Pradesh (3%), Jharkhand (2%)
 - **Karnataka** commands around 80% of the nation's total gold output. The **Kolar Gold Fields (KGF)** in the Kolar district is **one of the world's oldest and deepest** gold mines.
- **India Gold Import:** India is the world's **second-largest gold consumer**. India's **gold imports increased by 30% in 2023-24**, reaching **USD 45.54 billion**.
 - However, there was a significant decline of 53.56% in gold imports observed in March 2024.
- **Sovereign Gold Bond Scheme:** It was introduced by the Government in November 2015 as part of the **Gold Monetisation Scheme**.
 - The objective was to **decrease the demand for physical gold** and encourage a portion of domestic savings, typically used for buying gold, to be invested in financial savings instead.

What is the Gold Standard?

- The **Gold Standard (GS)** is a **voluntary carbon offset program** focused on progressing the **United Nations Sustainable Development Goals (SDGs)** and ensuring that project's benefit their neighbouring communities.
- It was developed under the leadership of the **World Wildlife Fund (WWF)**, **HELIO International**, and **SouthSouthNorth**, with a focus on offset projects that provide lasting social, economic, and environmental benefits.

Read More: [Increase in Gold Prices](#)



Note:

International Relations

Highlights

- *Dag Hammarskjöld Medal and International Day of UN Peacekeepers*
- *Socio-Economic Factors Fueling Unrest in PoK*
- *BIMSTEC Charter*
- *Arrest Warrants Against Israel and Hamas Leaders*
- *India's Contribution to Counter-Terrorism Efforts*
- *Chabahar Port Agreement*

Dag Hammarskjöld Medal and International Day of UN Peacekeepers

Why in News?

Indian peacekeeper **Naik Dhananjay Kumar Singh**, who served with the **United Nations Stabilisation Mission in the Democratic Republic of Congo (MONUSCO)**, will be posthumously awarded the prestigious **Dag Hammarskjöld medal** for his service and sacrifice.

Note:

- Naik Dhananjay Kumar Singh served under the **United Nations (UN)** flag as part of MONUSCO. He lost his life in the line of duty, demonstrating unwavering commitment to peacekeeping efforts.
- MONUSCO took over from a previous U.N. peacekeeping mission in the African country in 2010.
- MONUSCO aims to **protect civilians, humanitarian personnel and human rights defenders** from the imminent threat of physical violence and to support the government of the country in its stabilisation and peace consolidation efforts.

What is the Dag Hammarskjöld Medal?

- The Dag Hammarskjöld medal was established in December 2000 as a **posthumous award to members of peacekeeping operations who lost their lives during service** with a peacekeeping operation under the operational control and authority of the United Nations.
 - It is named after former **UN Secretary-General Dag Hammarskjöld**, who died in a plane crash while on a peacekeeping mission in 1961.
- Each year on **Peacekeeper's Day (29th May)**, this medal is awarded to any Member State who has lost one or

more military or police peacekeepers at a ceremony at headquarters of the UN.

International Day of UN Peacekeepers

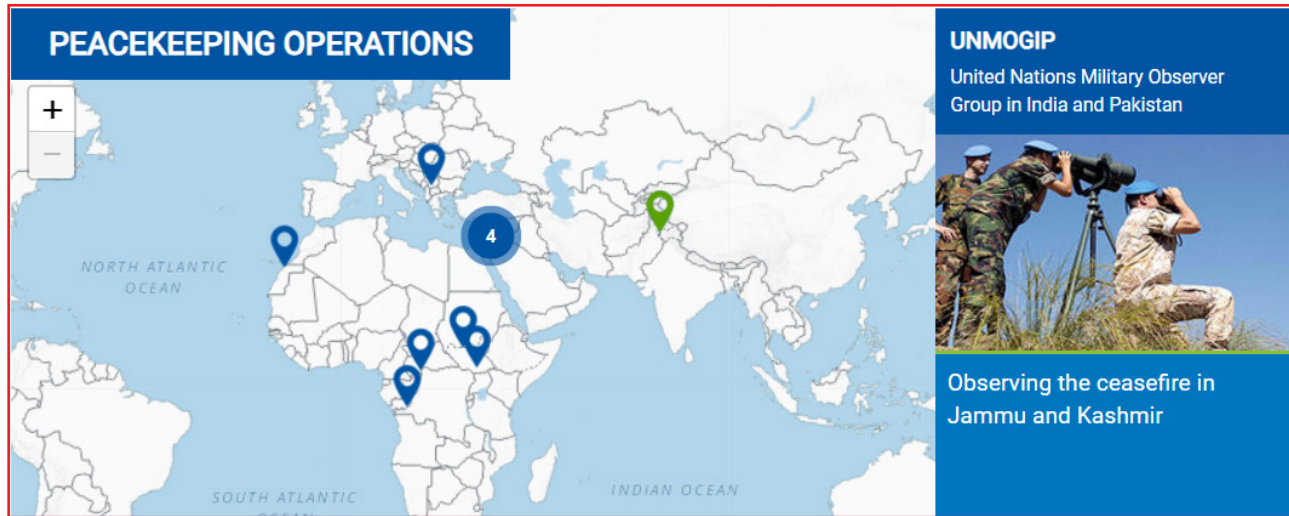
- The **International Day of UN Peacekeepers** was established by the UN General Assembly in 2002, to pay tribute to all men and women serving in peacekeeping, and to honour the memory of those who have lost their lives in the cause of peace.
 - **2024 Theme: 'Fit for the future, building better together'**, emphasises the evolution and adaptability of UN Peacekeeping to address future conflicts.

What is the U.N. Peacekeeping Mission?

- The U.N. Peacekeeping mission is a joint effort between the **Department of Peace Operations and the Department of Operational Support** and aims to assist host **countries to transition from situations of conflict to peace**.
- UN Peacekeeping was established during the **Cold War** when the Security Council was often paralysed by rivalries.
- The first two peacekeeping operations deployed by the UN were the **UN Truce Supervision Organization (UNTSO), in 1948** to monitor the Armistice Agreement between Israel and its Arab neighbours and the **UN Military Observer Group in India and Pakistan (UNMOGIP), in 1949**.
- More than two million peacekeepers from 125 countries have served in 71 operations around the world. Today, about 76,000 women and men are serving in 11 conflict zones across Africa, Asia, Europe, and the Middle East.
- The three main principles guiding the U.N. Peacekeeping missions are **Consent of the parties, Impartiality, and the Non-use of force except in self-defence and defence of the mandate**.

Note:





What is India's Contribution to UN Peacekeeping?

- **Contribution:** India is the **second largest contributor of uniformed personnel to UN Peacekeeping.**
 - Over 200,000 Indians have served in 49 U.N. Peacekeeping missions since 1948.
 - Presently, the **Indian Armed Forces** are deployed across nine countries in peacekeeping missions. 160 Indian Army soldiers have made the ultimate sacrifice for global peace.
 - The Indian Army has established a **Centre for UN Peacekeeping (CUNPK)** in New Delhi to impart niche training in peacekeeping operations. This Centre trains more than 12,000 troops every year.
 - The UN has mandated targets to **increase women peacekeepers' participation as part of its gender parity drive** to better address local women's concerns in missions.
 - India has deployed **Female Engagement Teams (FETs)** in the Democratic Republic of Congo and Abyei, the **second-largest Indian women contingent after Liberia.**
 - **Major Radhika Sen** has been selected for the **"Military Gender Advocate of the Year 2023"** award by the UN Headquarters, showcasing the positive contribution of Indian women in UN peacekeeping initiatives.
 - In 2007, India deployed an **all-women Formed Police Unit to the UN Operation in Liberia (UNMIL)**, making it the **first country to send an all-women contingent to a UN Peacekeeping mission.**

- **India's Displeasure with UNMOGIP:** Despite its presence in several countries as part of the Peacekeeping missions, India has routinely expressed its displeasure at the UNMOGIP mission headquartered in Srinagar and Islamabad. The UNMOGIP was established in 1949 to supervise the ceasefire between India and Pakistan.
 - UNMOGIP has remained in the region to observe hostilities between the neighbouring countries and report ceasefire violations along **the Line of Control (LoC).**
 - India has reiterated that the mission has "outlived its relevance" after the **Simla Agreement was signed by India and Pakistan in July 1972 and the establishment of the LoC.**

Read more: [India's Commitment to UN Peacekeeping, Peacebuilding Through The United Nations](#)

Socio-Economic Factors Fueling Unrest in PoK

Why in News?

- Protests have intensified in **Pakistan-occupied Kashmir (PoK)** due to soaring prices and economic woes. The region's unrest has led to violent clashes, causing deaths. Pakistan's economic crisis, marked by **high inflation**, has worsened living conditions.
- Trade in PoK suffered after **India hiked customs duties on Pakistani goods post the 2019 Pulwama attack**, exacerbating the financial strain.

Note:

Why is Pakistan's Economy Struggling?

- **High Inflation:** **Consumer inflation** has been above 20% since May 2022, reaching 38% in May 2023.
- **Energy Costs:** The cost of energy in Pakistan has risen significantly, contributing to the overall inflation. This has a cascading effect on the prices of goods and services across the economy.
- **Trade Disruptions:** After the **Pulwama attack in 2019**, India accused Pakistan and revoked its **Most Favored Nation (MFN) status**, imposing a **200% import duty on Pakistani products** such as dry dates, rock salt, cement, and gypsum.
 - Following Pulwama, India also accused Pakistan of **cross-border terrorism, smuggling, and money laundering**, leading to the suspension of trade across the **Line of Control (LoC)**.
 - This led to a sharp decline in Pakistan's exports to India, from an average of USD 45 million per month in 2018 to only USD 2.5 million per month between March and July 2019.
 - The significant reduction in exports to India has severely impacted traders, particularly in regions like PoK, contributing to economic instability.
 - The revocation of **Article 370 by India** further complicated the situation, as Pakistan sees it as an attack on the disputed territory.
 - High tariffs imposed by India act as a significant barrier to resuming normal trade activities.
 - In 2021, Pakistan attempted to normalise trade relations with India, but domestic pressures and the Kashmir issue halted progress.
 - The **current status of trade ties between India and Pakistan remains suspended from 2019**.

Why doesn't India Want to Resume Trade Relations with Pakistan?

- India's trade with Pakistan has always been a **minor part of its overall foreign trade**, accounting for less than **1% of its exports and imports**.
 - Political instability, fewer foreign reserves, strict visa policies, and Pakistan's small market size compared to India's make trade with Pakistan a risky proposition for India.
- Some in India believe that the **minimal threat from Pakistan's military**, which is preoccupied with its western borders, reduces the need for confidence-building measures through trade.

India-Pakistan Trade Before Ban

- Since 1996, Pakistan has had MFN status but maintained a **Negative List of 1,209 products not allowed to be imported from India**.
 - Only 138 products were allowed through the **Wagah-Attari border**.
- Despite this, **India had a significant trade surplus over Pakistan**, exporting more goods and services to Pakistan than it imported from Pakistan.
 - Political tensions between India and Pakistan significantly affected trade volume, often resulting in trade restrictions and reduced activity.
- **Indian Export to Pakistan:** In 2018-19, half of Indian exports to Pakistan were **cotton and organic chemicals**. Other significant items included plastic, tanning/dyeing extracts, nuclear reactors, boilers, machinery, and mechanical appliances.
- **Indian Import From Pakistan:** In 2018-19, India imported mineral fuels and oils, edible fruits and nuts, salt, sulphur, stone, slag, and ash, and leather from Pakistan.
 - After the ban, many imports decreased significantly. The only increase has been in **pharmaceutical products**, as Pakistan imported drug products and organic chemicals to ensure an adequate supply of medicines during the **Covid-19 pandemic**.

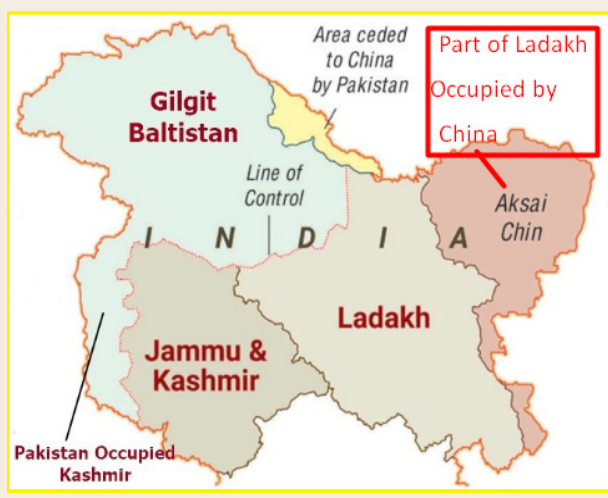
What are the Prospects for Future India-Pakistan Trade Negotiations?

- Historically, successful India-Pakistan negotiations have occurred in private settings, and the post 2024 Indian general election environment in both countries may provide an opportunity for quiet diplomacy.
 - The sustained **ceasefire along the LoC** and the absence of spectacular acts of terrorism since Pulwama provide a favourable premise for restarting **India-Pakistan relations**.
- Business-to-business links and the potential for Pakistan to facilitate **Indian trade to Afghanistan and Central Asia** through its territory could be leveraged to advocate for bilateral trade.
- Improved India-Pakistan trade relations could also boost India's regional influence, which has been declining due to **China's growing influence and India's focus on the Indo-Pacific**.

Note:

What is Pakistan Occupied Kashmir (PoK)?

- **Historical Context:** PoK was historically part of the princely state of Jammu and Kashmir, which acceded to India in 1947 after the Partition.
 - However, the region was illegally occupied by Pakistan in 1947 following an invasion by **Pashtun tribesmen and the Pakistani Army**.
- **Geographical Extent:** PoK covers an area of 13,297 sq km and has a population of over 40 lakh people. It is divided into 10 districts, with the capital being Muzaffarabad.
 - In 1963, Pakistan ceded over 5,000 sq km of this land to China in the **Shaksgam area**.
- **Gilgit Baltistan:**
 - **Gilgit Baltistan (GB)** is a separate region to the north of PoK and east of the Pakistani province of Khyber Pakhtunkhwa.
 - **GB was leased to the Dogra ruler of Jammu by the British** and later handed over to Pakistan in 1947.
- **Administrative Status:** Neither PoK nor GB are officially listed as part of Pakistan's four provinces.
 - Both are considered **"autonomous territories" ruled directly from Islamabad**, a fiction maintained by Pakistan to **avoid damaging its international position on the Kashmir dispute**.
- **India's Position:** For India, **PoK and GB are part of the state of Jammu and Kashmir**, which is an integral part of the country as per the **1994 Parliamentary resolution**.



BIMSTEC Charter

Why in News?

Recently, **Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC)** has recently achieved an important milestone with the charter of the grouping coming into force on 20th May 2024.

What is the BIMSTEC Grouping?

- **About:**
 - BIMSTEC is a **regional organisation** comprising **7 member states - Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka, and Thailand**.
 - It was formed in **1997** with the aim of promoting multifaceted technical and economic cooperation among the countries of the **Bay of Bengal** region.
 - The region covered by BIMSTEC is home to around **1.5 billion people**, with a combined GDP of over **USD 3.8 trillion**.
- **Origin:**
 - The sub-regional organisation was established in **1997** with the adoption of the **Bangkok Declaration**.
 - Initially consisting of 4 Member States, it was known as **'BIST-EC' (Bangladesh, India, Sri-Lanka and Thailand Economic Cooperation)**.
 - In **1997**, it was renamed **'BIMST-EC'** after Myanmar joined.
 - The admission of **Nepal and Bhutan** in **2004** led to another name change to the **'Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation'** (BIMSTEC).

What are the Key Features of the BIMSTEC Charter?

- **International Recognition:** BIMSTEC gains **official standing as a legal entity**, allowing it to interact directly with other international organisations on matters of diplomacy and cooperation.
- **Shared Goals:** The Charter **outlines BIMSTEC's objectives**, which focus on building trust and friendly relations among member states, and accelerating economic development and social progress in the Bay of Bengal region.
- **Structured Organisation:** A clear framework is established for BIMSTEC's operation, **outlining regular meetings at the Summit, Ministerial, and Senior Officials' levels**.

Note:

BIMSTEC
Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation

Members: 7
Formation: 6th June 1997 (Bangkok Declaration)
Significance: Hosts 22% of the world population, accounts for 3.8 trillion of GDP
Secretariat: Dhaka, Bangladesh

BHUTAN

- India is Bhutan's largest trade partner
- Mutually Beneficial Hydropower Cooperation: Mangdechhu, Kholongchhu, Chukha hydropower Projects
- India's grant assistance to Gyalsung Project
- Integration of Bhutan's DrukRen with India's National Knowledge Network

NEPAL

- Shares border with 5 Indian states (Uttarakhand, Uttar Pradesh, West Bengal, Sikkim and Bihar)
- Bharat Gaurav Tourist Train connecting India's Ayodhya and Nepal's Janakpur
- Major Issues: Territorial Disputes (Kalapani, Limpiyadhura and Lipulekh)
- Military Exercise: Surya Kiran (Army)

MYANMAR

- Only Southeast Asian country that shares a land border with north-eastern India
- The 2021 coup returned Myanmar to military rule
- India's Development Assistance: India-Myanmar-Thailand Trilateral Highway, Kaladan Multi-Modal Transit Transport (KMMTT), Sittwe port
- Major Issue: Rohingya Crisis

SRI LANKA

- India is Sri Lanka's third largest export destination
- India is the first country to officially back Sri Lanka's debt restructuring programme at IMF
- Major Issue: Fishermen crossing maritime boundary
- Important Exercises: Mitra Shakti (Army), SLINEX (Naval)

BANGLADESH

- Shares the longest border of over 4,096 km with India
- Largest trading partner in South Asia
- Water Sharing Agreements: Kushiyara river (2022), Ganga Water Treaty (1996)
- Major Issues: Teesta River Water Dispute
- Military Exercises: SAMPRITI-X (Military Training), Bongosagar (Naval)

THAILAND

- Thai language is written in script derived from Southern Indian Pallava alphabet
- Hinduism, Buddhism – both religions of Indian origin being popular in Thailand
- Convergence of India's 'Act East' policy with Thailand's 'Act West' policy
- Military Exercises: MAITREE (Army), SIAM BHARAT (Air Force), Indo-Thai CORPAT (Naval)

Drishti IAS

- **Expanding Membership:** The Charter paves the way for future growth by allowing new countries to join BIMSTEC and for other nations to participate as observers.
- Re-constitution and reduction in the number of sectors of cooperation to 7 and each member-state will serve as a lead for a sector.
 - Bangladesh in Trade, investment and development; Bhutan in environment and climate change; India in security, including energy; Myanmar in agriculture and food security; Neopal in people-to-people contacts; Sri Lanka in science, technology and innovation and Thailand in connectivity.

Note:

What is the Significance of BIMSTEC?

- **Aligned with Act East Policy:** BIMSTEC is more aligned with India's **Act East Policy**. It helps India gain trade and security prominence in the **Indian Ocean region and the Indo-Pacific**.
- **Alternative to SAARC:** Following India's efforts to isolate Pakistan at the 2016 **South Asian Association for Regional Cooperation (SAARC)** summit in response to the **Uri attacks**, BIMSTEC has emerged as a preferable regional cooperation platform, offering an alternative to SAARC in South Asia.
- **As a counter to China:** As China expands its **Belt and Road Initiative (BRI)** across South and Southeast Asia, India views this growing presence as a challenge to its regional dominance.
 - To counter this, India is taking a leading role in BIMSTEC, promoting it as an alternative platform for regional cooperation.
- **Promotion of Intangible Culture:** Initiatives like India's **Centre for Bay of Bengal Studies (CBS)** at Nalanda University, Bihar for research on art, culture and other subjects related to the Bay of Bengal can bring new insight and research in intangible heritage of the region.
- Platform for **Regional Cooperation:** It brings together countries from South Asia and Southeast Asia, providing a platform for **enhanced regional cooperation**.
 - It has promoted deepening cooperation in security matters and management of **Humanitarian Assistance and Disaster Relief (HADR)**.

How is BIMSTEC Different from SAARC?

Criteria	BIMSTEC	SAARC
Established	Originated by Bangkok Declaration in 1997	Originated by Adoption of Charter by Members in 1985 in Dhaka
Member Countries	Bangladesh, Bhutan, India, Myanmar, Nepal, Sri Lanka, Thailand	Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka
Geographical Focus	Interregional (South Asia and South East Asia)	Regional (South Asia)
Intra-Regional Trade	Increased around 6% in a decade	Around 5% since inception
Key Strengths	Connects SAARC countries with ASEAN , reasonably friendly relations among members, practical cooperation in 14 sectors	Long-standing regional forum, numerous agreements signed
Secretariat Location	Dhaka, Bangladesh	Kathmandu, Nepal
Leadership	Balancing of power with the presence of Thailand and India on the bloc	India perceived as 'Big Brother' by smaller members

What are the Challenges to BIMSTEC?

- **Lack of Efficiency and Slow Progress:** BIMSTEC faces challenges due to inconsistent policy-making, infrequent operational meetings, and a lack of adequate financial and human resources for its Secretariat.
- **Limited Intra-Regional Trade and Connectivity:** The **BBIN connectivity project** of Bangladesh, Bhutan, India and Nepal is yet to be finalised.
 - Despite signing **Free Trade Agreement (FTA)** in 2004, BIMSTEC stands far away from this goal. Of the seven constituent agreements needed for the FTA, only two are in place as of now.
 - Despite BIMSTEC's goal of economic cooperation, **regional trade remains low**. In 2020, India's trade with BIMSTEC countries only accounted for **4%** of its total foreign trade. **India-Myanmar border called as "Asia's least open."**
 - BIMSTEC members trade more with non-members than with each other.

Note:

- **Challenges in Maritime Trade and Fisheries: The Bay of Bengal is a rich fishing ground**, boasting an annual fish catch of 6 million tonnes (7% of the world's total) and extensive coral reefs.
 - According to the **FAO**, the **Bay of Bengal is one of Illegal, Unreported and Unregulated (IUU) fishing hotspots in the Asia-Pacific.**
- Other Issues Among Member States:
 - **Rohingya refugee** crisis between Bangladesh and Myanmar.
 - **India-Nepal border issues.**
 - Myanmar's domestic political instability after the military coup.

Arrest Warrants Against Israel and Hamas Leaders

Why in News?

Recently, the **International Criminal Court (ICC)** prosecutor has requested arrest warrants against leaders of Hamas and the Prime Minister and Defence Minister of Israel for the war crimes in Palestine.

Note:

- Israel is **not a member of the ICC**, so even if the arrest warrants are issued, the concerned leaders do not face any immediate risk of prosecution. However, if the threat of arrest further deepens Israel's isolation will make it difficult for the Israeli leaders to travel abroad.
- The ICC accepted **"The State of Palestine" as a member in 2015.**

What is the International Criminal Court?

- **About ICC:**
 - It is the **world's first permanent international criminal court** governed by an international treaty called **'The Rome Statute'**.
 - In 1998, the Rome Statute was **adopted by 120 States** in the direction of creating a more just world.
 - In 2002, Rome Statute **took effect upon ratification by 60 states**, officially establishing the ICC. Since it has **no retroactive jurisdiction**, the ICC deals with crimes committed on or after this date.
 - **India is not a party to the Rome Statute** along with the US and China.
 - **124 countries** are States Parties to the Rome Statute of the International Criminal Court with **Malaysia** being the last one.
- **Jurisdiction and Working:**
 - It investigates and, wherever warranted, **tries individuals**

ISRAEL-PALESTINE CONFLICT

The Israel-Palestine conflict is a long-standing geopolitical dispute over territory and self-determination in the Middle East.

|| BEGINNING

- 📌 UN adopted **Resolution 181** - the Partition Plan in 1947
- 📌 State of Israel created in 1948, sparking the **first Arab-Israeli War** (Israel won)
 - Palestinians displaced
 - Division of territory into - State of Israel, West Bank and Gaza Strip

|| INITIAL TENSIONS AND CONFLICTS (1956-1979)

- 📌 **Suez Crisis** and Israeli **invasion of Sinai Peninsula** in 1956
- 📌 **Six-Day War (1967)** - Israel gained control over Sinai Peninsula, Gaza Strip, West Bank, East Jerusalem and Golan Heights

Controversy over Jerusalem as Capital

- **Israel view:** Complete and united Jerusalem
- **Palestinians view:** East Jerusalem future capital

- 📌 **Yom Kippur War (1973)** - Surprise attack by Egypt and Syria
- 📌 **Camp David Accords (1979)** b/w Egypt and Israel

Intifada (Arabic for 'shake off')

- **First Intifada** - 1987 to 1993
 - ◆ Led to the foundation of Hamas (1987) - a Palestinian political party designated as a foreign terrorist org by US
 - ◆ Response - **Madrid Conference 1991** (chaired by the US and Russia)
- **Second Intifada** - 2000-2005
- The latest escalation (2023) is being called the beginning of "Third Intifada"

📌 Second (1995)

- Expanded on Oslo I Accords
- Mandated **complete Israeli withdrawal** from several cities and towns in **West Bank**

|| POST 2000 CONFLICT AND RESPONSES

- 📌 **2013** - US-led peace process began
- 📌 **2014-18** - Gaza Conflict (2014)
 - Palestine announced break from territorial divisions under Oslo Accords (2015)
- 📌 **2018-20** - US Cancelled funding for Palestinian refugees under UN Relief and Works Agency (UNRWA)
 - US proposed **"Peace to Prosperity"** plan
- 📌 **2020** - **Abraham Accords**
- 📌 **2022-2023:**
 - Israel raids on **Jenin refugee camp**
 - Hamas launched **"Operation Al-Aqsa Flood"** and Israel launched **"Operation Iron Swords"** (both in 2023)
 - ◆ Israel declared a **State of War**
 - **India's Stand:**
 - ◆ Supports a **Two State solution** for Israel and Palestine
 - ◆ **Condemned the recent attack** by Hamas on Israel.

Considered occupied territory by most of the international community

GOLAN HEIGHTS, LEBANON, DAMASCUS, SYRIA, HEBRON, TEL AVIV, WEST BANK, RAMATHAN, JERUSALEM, GAZA STRIP, ISRAEL, JORDAN, EGYPT, SAUDI ARABIA

30 miles



DRISHTI IAS

Note:

charged with the gravest crimes of concern to the international community: **genocide, war crimes, crimes against humanity and crimes of aggression**. Also:

- The crimes are committed by a State Party national, in the territory of a State party, or in a State that has accepted the jurisdiction of the court.
- The crimes are referred to the **International Criminal Court Prosecutor** by the **United Nations Security Council (UNSC)** pursuant to a resolution adopted under Chapter VII of the UN Charter.
- The ICC is **intended to complement, not to replace, national criminal systems**.
 - It prosecutes cases only when States are unwilling or unable to do so genuinely.
 - ICC is **not a UN organisation** but it has a cooperation agreement with the UN.
- When a situation is not within the Court's jurisdiction, the **UNSC can refer** the situation to the International Criminal Court granting it jurisdiction.
 - Several countries like Israel, the US, Russia and China. don't accept the court's jurisdiction over war crimes, genocide and other crimes.

➤ Difference between ICC and ICJ:

Differences between the ICJ and the ICC		
	 ICJ International Court of Justice	 ICC International Criminal Court
Established	1945	2002
UN-relationship	Highest court of the UN	Not part of the UN
Location	The Hague, the Netherlands	The Hague, the Netherlands
Jurisdiction	UN member-states	Individuals
Types of cases	Legal disputes between states and requests for advisory opinions on legal questions	Prosecutes individuals for the most serious crimes as per the Rome Statute
Appeals	No	Yes
Enforcement power	None - relies on the UN Security Council to uphold judgements, with permanent members having veto power	None - relies on cooperation from member states to enforce its decisions

What is a War Crime?

- **About:**
 - War crimes are defined as **serious violations of humanitarian laws** during a conflict; the taking of hostages, **willful killings, torture or inhuman treatment of prisoners of war**, and forcing children to fight are some of the more obvious examples.

- It is based on the idea that individuals can be held liable for the actions of a state or its military.

➤ War Crime vs Crime Against Humanity:

- The United Nations Office on Genocide Prevention and the Responsibility to Protect (or **Genocide Convention**) separates war crimes from genocide and crimes against humanity.

- **War crimes** are defined as occurring in a domestic conflict or a war between two states.

- While **genocide and crimes against humanity** can happen in peacetime or during the unilateral aggression of a military towards a group of unarmed people.

➤ Geneva Conventions on War Crime:

- The **Geneva Conventions (1949)** and their Additional Protocols are international treaties that contain the most **important rules limiting the barbarity of war**.

- They **protect people who do not take part in the fighting** (civilians, medics, aid workers) and those who can no longer fight (wounded, sick and shipwrecked troops, prisoners of war).

- The **first Geneva Convention** protects wounded and sick soldiers on land during war.

- The **second Geneva Convention** protects wounded, sick and shipwrecked military personnel at sea during war.

- The **third Geneva Convention** applies to **prisoners of war**.

- The **fourth Geneva Convention** affords protection to civilians, including in occupied territory.

- **India is a party** to all the four Geneva Conventions.

India's Contribution to Counter-Terrorism Efforts

Why in News?

Recently India has made a **significant financial contribution** to the **United Nations Counter-Terrorism Trust Fund (CTTF)**, marking a pivotal moment in its ongoing commitment to combating terrorism on a global scale.

- With its current contribution, India's cumulative financial support to the trust fund now stands at \$2.55 million.

Note:

What is the UN Counter-Terrorism Trust Fund?

- **About:**
 - The **UN Counter-Terrorism Trust Fund (UNCTTF)** aims to **support global efforts** in countering terrorism.
 - It was **established in 2009** and incorporated into the **UN Office of Counter-Terrorism (UNOCT) in 2017**.
 - The fund focuses on **enhancing the capacity** of member states, particularly in **Eastern and Southern Africa**, to **tackle significant challenges** such as financing terrorism and curtailing the movement and travel of terrorists.
- Global Programs Supported by UNCTTF:
 - **Capacity Building:** The Trust Fund assists member states in strengthening their **ability to combat terrorism** effectively.
 - This assistance includes **training for law enforcement agencies**, improving legal structures, and enhancing the technical expertise of counter-terrorism personnel.
 - **Countering the Financing of Terrorism (CFT):** The Trust Fund is vital for **preventing and countering terrorism financing** by **strengthening regulatory frameworks**, enhancing financial tracking capabilities, and promoting international cooperation.
 - **Countering Terrorist Travel Programme (CTTP):** This program seeks to prevent terrorist movements by enhancing border security, utilising advanced passenger information, and promoting international information exchange and best practices.
 - The **Trust Fund** also supports balanced implementation of the **four pillars** of the **UN Global Counter-Terrorism Strategy**; addressing terrorism's root causes, combating terrorism, building state capacity, and ensuring human rights are respected.

United Nations Office of Counter-Terrorism (UNOCT)

- The **United Nations General Assembly** established the United Nations Office of Counter-Terrorism (UNOCT) in 2017.
- It was created to provide leadership on the General Assembly's counter-terrorism mandates and to **enhance coordination and coherence** across the UN system's counter-terrorism activities.
- The UNOCT supports Member States in implementing the **UN Global Counter-Terrorism Strategy**,

What is India's Contribution to Global Counter-Terrorism Efforts?

- **Bilateral:**
 - India conducts meetings of the **Joint Working Groups** with the United Kingdom, **France**, and the **United States** on counter-terrorism.
- **Multilateral:**
 - **BRICS:** India has been actively pursuing the issue of terrorism in multilateral forums including **BRICS** which has yielded positive results including the formation of five sub-working groups under BRICS focusing on terrorist financing, online terrorism, radicalization, foreign terrorist fighters, and capacity-building.
 - **UNSC CTC:** In 2022, India hosted a special meeting of the **UNSC's Counter Terrorism Committee (CTC)** to discuss terror-financing through crypto-currency and use of drones in the new-age terrorism. India listed five points for the consideration of the CTC:
 - Effective and sustained efforts to counter terror-financing.
 - Normative efforts of the UN need to be coordinated with other fora like the **Financial Action Task Force (FATF)**.
 - Make sure that the Security Council's sanctions regime is not rendered ineffective because of political reasons.
 - International cooperation and concerted actions against terrorists and their sponsors including the dismantlement of terrorist safe havens, etc. are critical imperatives.
 - Recognise these **linkages and strengthen multilateral efforts** to break against terrorism's nexus with a **transnational organised crime** like arms and illicit drug trafficking.
 - **India's Contribution to UNCTTF:** India has been actively supporting programs aimed at combating the threat of terrorism thus underscoring its dedication to supporting multilateral efforts in the fight against terrorism.
 - The financial aid is aimed at bolstering UNOCT's initiatives, such as the **Countering Financing of Terrorism (CFT)** and the **Countering Terrorist Travel Programme (CTTP)**.

Note:

➤ Significance:

- India's collaborative efforts help in **enhancing the capacities** of countries' to combat terrorism financing and prevent the movement of terrorists across borders.
- By addressing the **growing threat of terrorism in Africa** (via UNCTTF), India aims to assist African nations in their efforts to counter terrorism and promote regional stability.
 - The steps align with India's emergence as a Global South leader and with India's priority of zero tolerance for Terrorism.

Other Initiatives to Counter Terrorism

➤ International:

- [Terrorism Prevention Branch \(TPB\) of the United Nations Office on Drugs and Crime \(UNODC\)](#)
- [Financial Action Task Force \(FATF\)](#)
- [India's Annual Resolution on Counter-Terror](#) (adopted in UNGA)

➤ Indias-specific:

- [National Investigation Agency](#)
- [Unlawful Activities \(Prevention\) Amendment Act](#)
- [National Intelligence Grid \(NATGRID\)](#)
- [National Security Guard](#)

What are the Challenges Related to Terrorism?

- **No Global Definition of Terrorism:** The absence of universally accepted definitions for terrorism makes classifying specific activities difficult, granting terrorists an advantage and enabling certain countries to block action at global institutions.
- **Expanding Web of Terrorism:** The internet offers terrorists an unregulated platform to craft and spread propaganda, tailoring messages to recruit new members and advance their cause across numerous websites and social media platforms.
- **Terror Financing:** Criminals launder an estimated two to nearly four trillion dollars annually, according to the IMF and World Bank, while terrorists conceal fund movements through charities and alternative remittance systems.
- **Cyber Attack:** The world is becoming digitally interconnected, with data as a valuable resource, where terrorists exploit cyber attacks to intimidate or coerce governments and societies for their goals.

Chabahar Port Agreement

Why in News?

- Recently, **India and Iran** signed a **10-year** contract for operating the **Chabahar port** in Iran.
- This long-term agreement was signed between **Indian Ports Global Ltd. (IPGL)** and **Port and Maritime Organisation (PMO)** of Iran, enabling operation of the **Shahid-Beheshti terminal**.
 - Signing of a long-term contract with Iran is part of India's strategic and economic vision for **Central Asia** and beyond.



Why is the Chabahar Port Important for India?

➤ About:

- Chabahar is Iran's oceanic port nearest to India. It is situated in **Sistan and Baluchistan Province**, on the **Makran coast**. It lies in the **Gulf of Oman**.
- Chabahar Port project has two main ports called the **Shahid Kalantari Port** and the **Shahid Beheshti Port**.
 - Iran had offered India the project of developing the **Shahid Beheshti port** which was well received by India.

➤ Progress and Updates Regarding the Chabahar Port Deal:

- India signed a **memorandum of understanding (MoU)** for the development of the **Chabahar port** in **May 2015**.
- In May 2016, **India, Iran, and Afghanistan** signed a **trilateral agreement** to establish the **International Transport and Transit Corridor**, also known as the **Chabahar Agreement**.

Note:

- This agreement aimed to **improve transportation and trade connectivity** between the three countries by utilising the port of Chabahar in Iran as a key transit point.
 - However, the finalisation of the long-term agreement has been delayed by several factors including differences on some clauses in the pact.
 - The point of **disagreement was the location of arbitration for disputes**. India preferred a neutral country, while Iran insisted on its own courts or a favourable one.
 - Now, both parties have agreed on a compromise that satisfies their respective interests. The contract stipulates that any disagreements should be settled through **open communication and cooperation between the leaders** of both countries.
 - This fresh long-term agreement aims to supersede the initial contract, spanning a duration of 10 years with **automatic renewal** provisions.
- **Significance of Chabahar Port:**
 - **Alternative Trade Route:** Historically, India's access to Afghanistan and **Central Asia** has been largely dependent on transit routes through Pakistan.
 - Chabahar Port offers an **alternative route that bypasses Pakistan**, reducing India's reliance on its neighbour for trade with Afghanistan and beyond.
 - Also, Chabahar port will boost India's access to Iran, the key gateway to the **International North-South Transport Corridor (INSTC)** that has sea, rail and road routes between India, Iran, Russia, Central Asia and Europe.
 - **Economic Benefits:** Chabahar will play a crucial role in India's efforts to enhance **connections with the resource-rich Central Asian countries and Afghanistan**.
 - It will allow India to **diversify its trading routes** and gain enhanced **access to the markets** of Russia, Eurasia and Europe, apart from Iran and Afghanistan.
- Cargo movement through **INSTC route is expected to save 30% in cost and 40% in transportation time**, ensuring quick turnaround at a competitive cost.
 - **Central Asian nations**, rich in resources but without direct access to the sea like Kazakhstan

and Uzbekistan, have **shown interest** in utilising Chabahar to **connect to the Indian Ocean Region** and tap into the Indian market.

- **Humanitarian Assistance:** Chabahar Port can serve as a crucial entry point for **humanitarian assistance** and reconstruction efforts in Afghanistan.
 - Port has played a crucial role in **supplying humanitarian aid**, notably during the **Covid-19** pandemic.
 - 2.5 million tonnes of **wheat** and 2,000 tonnes of **pulses** have been trans-shipped from India to **Afghanistan** via Chabahar port.
 - In 2021, India provided 40,000 liters of the eco-friendly **pesticide malathion** to Iran through the port to combat **locust attacks**.
- **Strategic Influence and Regional Stability:** By developing and operating Chabahar Port, India can enhance its strategic influence in the **Indian Ocean region**, thus strengthening India's geopolitical position.
 - The Chabahar port will act as a **counter to China's development of the Gwadar port in Pakistan**.
 - Also, India can effectively respond to cases of **sea piracy** and serve as a first line of defense in the Arabian Sea, due to the docking facilities available at Chabahar.

What are the Challenges in Realising Potential of Chabahar Port?

- **Concern of US with Iran:**
 - The **United States** warned India of "**potential risk of sanctions**" after it signed a long-term main contract for the development of Chabahar Port of Iran.
 - The US has imposed restrictions on activities with Iran under various legal authorities since 1979, following the seizure of the **US Embassy in Tehran**.
 - Earlier in 2018, the **US granted India an exemption from specific sanctions** in order to support the advancement of the Chabahar port and the building of a railway link to connect it with Afghanistan.
- **Houthi-Red Sea Crisis:**
 - The Houthi rebels can disrupt sea lanes of communication, **which will affect traffic at the Chabahar port as well**.

Note:

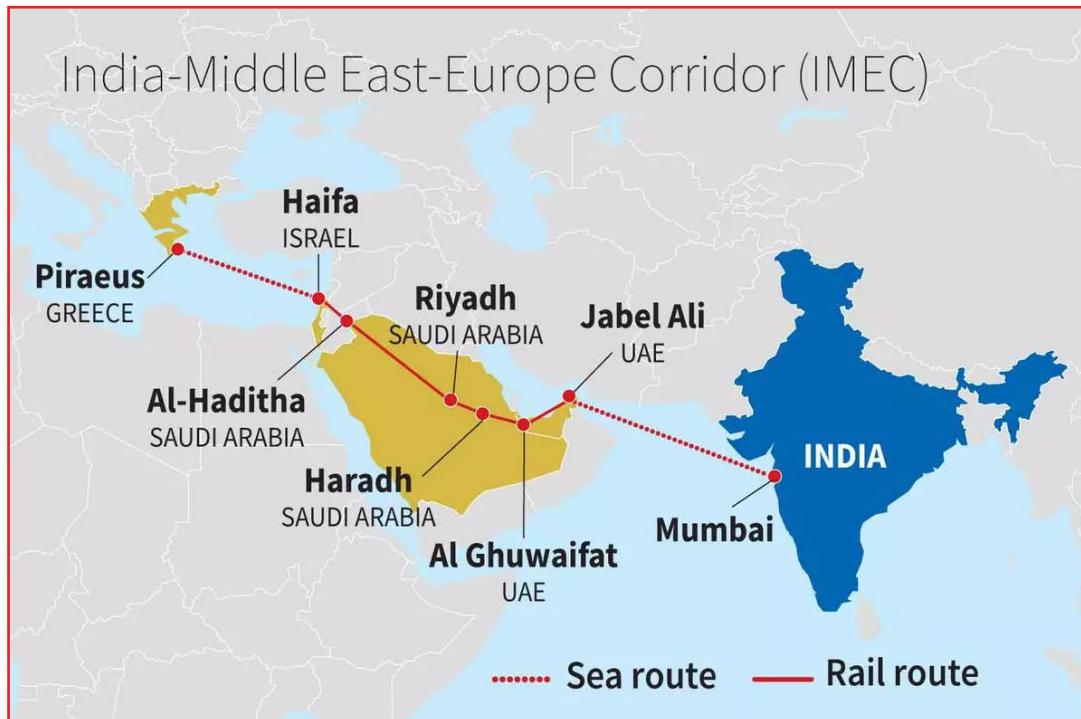
➤ **Security Concerns, Regional Tensions:**

- The **US exit from Afghanistan** and the return of the Taliban there, have created an **unstable situation** there which has **negatively influenced trade relations with India**.
- Unstable relations **between Iran and some of its neighbours, such as Israel**, as well as the unstable political situations in neighbouring countries like

Afghanistan and Pakistan, are also taking a toll on India's economic interests at Chabahar Port.

➤ **Competition from Similar Projects:**

- Opposition or competition from several transport routes, like the **India-Middle East-Europe Economic Corridor (IMEC)** poses a challenge to Chabahar as both of these corridors link Asia with Eastern Europe.



➤ **Competition from China:**

- Chinese investment in Chabahar can undermine India's interest in Iran due to strong competitors like China.

➤ **Infrastructure development:**

- The Chabahar Project seeks to improve infrastructure such as ports, roads, and railways, requiring significant investment, time, and expertise. Any delays or inefficiencies could impede its progress.

What is the Status of Economic Ties Between India and Iran?

- India-Iran bilateral trade during **FY 2022-23** was **USD 2.33 billion**, showing a year-on-year growth of 21.76%.
- India's **export** to Iran was **USD 1.66 billion** and India's **import** from Iran was **USD 672.12 million**.
- Total trade decreased by 23.32% compared to the corresponding figure of the previous year.
- India mainly exported agricultural goods and livestock products to Iran, including meat, milk products, onions, garlic, and canned vegetables.
- Imports from Iran included methyl alcohol, petroleum bitumen, liquified butanes, apples, liquified propane, dates, and almonds.
- The FDI inflows from Iran to India were recorded at just USD 1 million from April 2000 to December 2023.
- India currently **does not import Iranian oil** as Tehran is under sanctions from the United States (US).



Note:

Social Issues

Highlights

- Tobacco Epidemic in India
- Menstrual Hygiene in Indian Prisons
- World Bank Report on Global Water Crisis
- Early Cancer Detection in India and CRC Tumour Breakthroughs
- Packaged Food and Health Concerns

Tobacco Epidemic in India

Why in News?

Tobacco is the most widely recognised preventable cause of disease and death in the world.

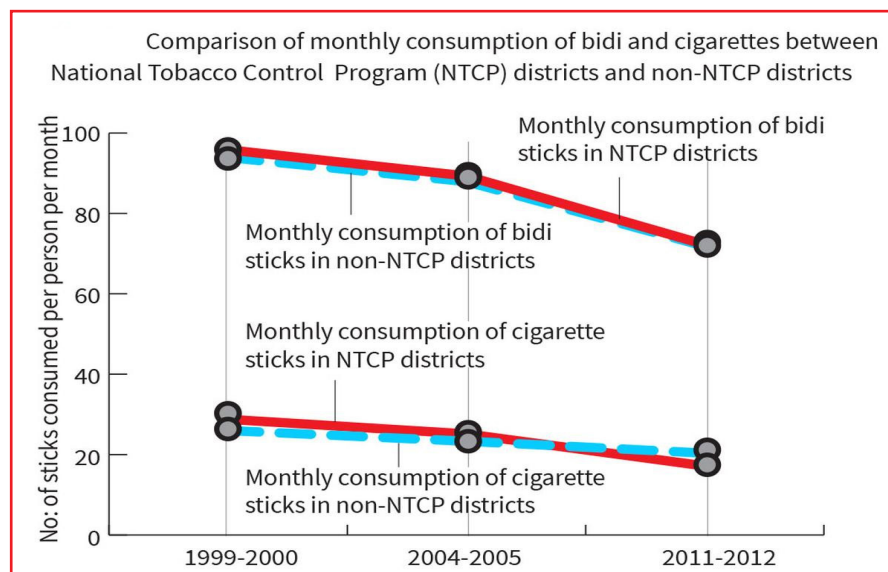
- India has the **world's second-highest** (after China) number of tobacco consumers, with nearly 26 crore people.

Key Facts about Tobacco Usage

- Tobacco kills up to half of its users who don't quit.
- Tobacco kills more than 8 million people each year, including an estimated 1.3 million non-smokers who are exposed to second-hand smoke.
- In India, nearly 1.35 million die every year due to use of tobacco.
- Around 80% of the world's 1.3 billion tobacco users live in low- and middle-income countries.
- In 2020, 22.3% of the world's population used tobacco

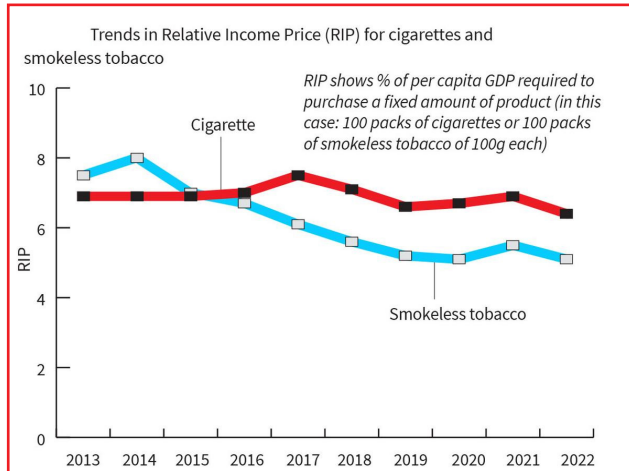
What are the Statistics About Tobacco Consumption in India?

- **No Significant Decrease of Bidi or Cigarette Consumption:** As per **National Family Health Survey (NFHS)** there is no significant difference in the reduction of bidi or cigarette consumption between **National Tobacco Control Programme (NTCP)** and non-NTCP districts.
 - Possible reasons for this may be **insufficient staffing, resource allocation, and utilisation**, and lack of effective monitoring mechanisms.

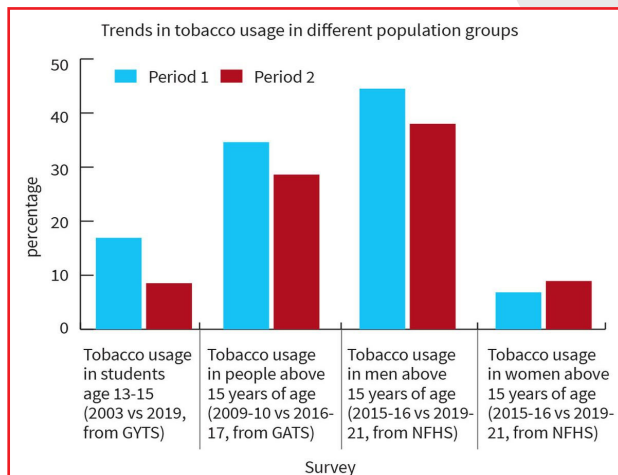


Note:

- **Cigarettes and Bidis Have Become More Affordable:** In the past 10 years, cigarettes, bidis, and smokeless tobacco products (SLTs) **have become cheaper.**
 - **Goods and Services Tax (GST)** system has made them even more affordable due to **integrated tax system which lowered the prices.**



- **Tobacco Use Higher Among Women:** Tobacco use has declined in all groups, **except for women where use increased by 2.1% between 2015 and 2021.**



World No Tobacco Day:

- **World No Tobacco Day is observed on 31st May.**
- **World No Tobacco Day** was created in **1987** by the Member States of the **World Health Organization** to draw global attention to the tobacco epidemic and its consequences.
 - The day aims to **inform the public about the dangers of using tobacco.**

- It also **encourages people around the world to claim their right to health** and healthy living and to protect future generations.
- **Theme for 2024: “Protecting Children from Tobacco Industry Interference”**
- The day serves as a **reminder of the preventable death and disease caused by tobacco** use, and highlights the importance of tobacco control policies and interventions.

Ahilyabai Holkwar:

- **31st May** also commemorates the **birth anniversary of Queen Ahilyabai Holkar**. Ahilyabai Holkwar was **born on 31st May 1725**, in the village of Chondi, Ahmednagar district, Maharashtra.
 - In 1733, she married Khanderao Holkar, the son of Malhar Rao Holkar, the founder of the **Holkar dynasty of the Maratha Empire**.
- She became the ruler of the Malwa kingdom after her husband's death in 1754.
- She **contributed to the construction** of many temples, including the famous **Kashi Vishwanath Temple in Varanasi**.
- She **abolished the practice of Sati** in her kingdom and promoted education and women's rights.
- Ahilyabai Holkar died on 13th August 1795.

How is India Fighting Against Tobacco?

- **International Commitment:**
 - **WHO Framework Convention on Tobacco Control (FCTC):**
 - India is one of the 182 signatories of this Convention, which signifies its commitment to global tobacco control efforts.
 - It aims to reduce tobacco usage worldwide by helping countries **develop demand and supply reduction strategies** and effective national tobacco control policies.
 - **World No Tobacco Day:**
 - **31st May** is observed as 'World No Tobacco Day' every year to spread awareness around the deadly effects of tobacco consumption.
- **National Legislation:**
 - **Cigarettes and Other Tobacco Products (Prohibition of Advertisement and Regulation of Trade and Commerce, Production, Supply, and Distribution)**

Note:

Act (COTPA) 2003: It governs different aspects of tobacco, such as production and supply, advertising and promotion, distribution and sale, as well as packaging and labeling.

- **National Tobacco Control Program (NTCP) 2007:** To strengthen COTPA implementation and FCTC compliance. Its key functions includes
 - **Public Awareness Campaigns:** Mass media campaigns educate the public about the health risks of tobacco use.
 - **Smoking Cessation Initiatives:** Through quitlines, counselling, and behavioural interventions.
 - **Enforcement Mechanisms:** Enforcement of COTPA provisions with the help of designated authorities.
- **The Prohibition of Electronic Cigarette Act (PECA), 2019:** It has banned e-cigarettes in India.
- **National Tobacco Quitline Services (NTQLS):**
- **mCessation Programme:** Initiative for tobacco cessation by mobile technology.
 - Launched in 2016 as part of the government's **Digital India initiative.**
- Tobacco Taxation:
 - India taxes tobacco heavily, **with cigarettes at 53% of retail price.** Bidis, a cheaper option, are taxed much lower at 16%. Public health experts want **higher bidi taxes to discourage use and raise government revenue.**

What are Hidden Costs of Tobacco Beyond Health Risks?

- **Soil Depletion:** Tobacco rapidly depletes soil nutrients, requiring more fertilisers which further harm soil quality.
- **Deforestation:** Tobacco production contributes to deforestation, requiring significant wood for processing. **Up to 5.4 kg of wood is required to process 1 kg of tobacco.**
- **Waste Generation:** Production and consumption of tobacco **creates a massive waste burden (1.7 lakh tonnes annually in India).**
- **Economic Burden:** Tobacco use leads to **immense healthcare costs** (estimated Rs.1.7 lakh crore loss in India, 2017-18) exceeding the national health budget (Rs 48,000 crore).
 - **Over 6 million people working in the tobacco industry** are at risk due to **tobacco absorption through the skin**, leading to potential health issues.

- **Waste Management Cost:** Cleaning up tobacco waste is a significant additional cost (estimated Rs.6,367 crore annually in India).

What are Challenges to Effective Tobacco Control in India?

- **Non-compliant Products:** Smokeless tobacco (like gutkha) and smuggled products avoid **COTPA (Cigarettes and Other Tobacco Products Act) regulations**, making it harder to control their production, sale, and marketing.
- **Weak Fines: Low fines** (eg: maximum fine of only Rs. 5,000 for violating packaging restrictions for the first time) **for COTPA violations** (not updated since 2003) **don't act as a strong enough deterrent for violators.**
- **Surrogate Advertising:** Tobacco companies cleverly use advertisements for other products (like elaichi) to **indirectly promote their brands**, making it difficult to regulate their marketing reach. These **advertisements** indirectly promote tobacco use.
 - The **ICC Men's Cricket World Cup 2023** displayed **surrogate advertisements for at least two tobacco brands.**
- **Stalled Amendments:** The Indian government **hasn't passed proposed amendments to strengthen COTPA in 2015 and 2020**, which could have addressed these gaps.
- **Limited Enforcement Capacity:** The National Tobacco Control Programme (**NTCP**) **lacks the staff, resources, and proper monitoring** systems to fully implement COTPA across the country.
- **Effective Lobbying in Tobacco Industry:**
 - **E-cigarettes are banned, but problem persist:** Policy (banning e-cigarettes) isn't being fully enforced.
 - **Tax breaks for Small Tobacco Companies:** The **government isn't taxing all tobacco products equally**, making it cheaper for some people to buy harmful products.
 - **Conflict of Interest with Government:** It raises concerns about government's commitment to tobacco control.
 - **Central government holds a 7.8% stake in ITC Ltd.,** India's largest tobacco company.

Note:

Menstrual Hygiene in Indian Prisons

Why in News?

On [World Menstrual Hygiene Day 2024](#), India celebrates significant progress in menstrual hygiene management, with the [5th National Family Health Survey \(NFHS 2019-2020\)](#) reporting that **around 80% of young women aged 15-24 now use safe menstrual hygiene products.**

- However, the needs of one of the most marginalized groups of **women in Indian prisons** remain overlooked. Societal biases deny these women **basic rights and proper menstrual hygiene management**, highlighting a critical area for further improvement.

What is the Status of Menstrual Hygiene in Prisons?

- **Population:** According to the [National Crime Records Bureau](#), there are 23,772 women in Indian prisons, with 77% of them in the reproductive age group (18-50 years) and likely to be regular menstruators.
- **Inconsistent Access:** The availability of [sanitary napkins](#) is inconsistent across prisons, and the quality of these products could be better.
- **Uniform Product Size:** All prisons issue **'one size' sanitary pads**, which do not cater to the varying needs of different women.
 - Most prisons do not offer other types of menstrual products like tampons or menstrual cups.
- **Lack of Facilities:** Despite the [2016 Model Prison Manual's](#) recommendations, **many states have not provided female prisoners with adequate water and washroom facilities.**
- **Waste Disposal Issues:** Proper disposal of menstrual hygiene materials is often neglected, impacting both women's health and the facility's hygiene.
- **Additional Challenges: Overcrowding and poor socio-economic conditions** further hinder access to necessities like water, detergent, and soap.

Why is Menstrual Hygiene Management Overlooked in Prisons?

- **Stigma and Silence:** Menstruation itself can be a **taboo subject**, and there might be hesitation to discuss it openly, especially in a prison environment. This can make it difficult for women to ask for what they need.

- **Lack of Legal Framework:** There is no law mandating the provision of free, unlimited sanitary products in prisons.
 - No prison rule has provisions for providing hot water to women prisoners to manage menstruation.
 - **Menstrual Health Schemes:** Existing schemes like the [Menstrual Hygiene Scheme 2011](#), [Swachh Bharat Abhiyan](#), and [Pradhan Mantri Bhartiya Janaushadhi Pariyojana](#) **do not specifically address the needs of women prisoners.**
 - The [Model Prison Manual 2016](#) suggests providing sterilised sanitary pads as needed, but implementation varies widely across states and prisons.
- **Data Deficiency:** There is a lack of data on **water availability in prisons**, complicating efforts to address hygiene needs effectively.
- **Lack of Awareness:** Prison authorities may not be fully aware of the specific needs of women during menstruation, or the importance of menstrual hygiene for their health.
- **Budgetary Constraints:** Providing menstrual products can be seen as an extra expense, especially in overcrowded prisons with limited resources.

Menstrual Hygiene Management (MHM)

- It is a critical aspect of public health and human rights. It refers to the **practice of using clean menstrual materials to absorb or collect blood, which can be changed in privacy** as often as necessary during menstruation.
- MHM also includes the use of soap and water for washing the body as required and having access to facilities to dispose of used menstrual materials.
- [UNICEF](#) emphasises the importance of MHM as it affects the **dignity, health, and education** of millions of people who menstruate, particularly in developing countries where access to clean water and sanitation facilities may be limited.
- The [World Bank](#) also highlights the need for access to [water, sanitation, and hygiene \(WASH\) facilities](#), affordable menstrual hygiene materials, information on good practices, and a supportive environment to manage menstruation without embarrassment or stigma.
- **Menstrual health is recognised as a human rights issue.** Everyone has the right to bodily autonomy, which includes the **ability to care for one's body during menstruation.**

Note:

UNFPA-UHCHR

Menstrual hygiene management kit (MHM)

One kit contains the essential menstrual hygiene items to cover the needs of a menstruating person for up to three months.

Standard content

- Disposable sanitary pads
- Female underwear (panty)
- Detergent/Washing Powder
- Clothes pegs + string
- Bath soap + plastic holder
- Leaflet

Variable content

- Disposable sanitary pads
- Reusable menstrual Pads
- Menstrual cups
- Tampons

May 2023 UNFPA Supply Chain Management Unit
unfpa.org/supplychain

World Menstrual Hygiene Day 2024

- World Menstrual Hygiene Day is an annual awareness day held on **28th May**. It aims to **break the silence and stigma surrounding menstruation** and promote good menstrual hygiene management.
- **Theme: “#PeriodFriendlyWorld”**.
- **History:** In 2013, **Germany-based NGO WASH United** introduced Menstrual Hygiene Day to combat the stigma around menstruation and promote access to proper sanitary facilities and affordable menstrual products.

What are the Government Initiatives Related to Menstrual Hygiene?

- **National Menstrual Hygiene Policy:** Introduced in 2023, this policy emphasises safe and dignified MHM for all.
 - Remarkably, the **policy identifies prisoners as a target population** with compromised access to menstrual hygiene facilities, marking a positive step forward.
 - **Lack of Concrete Plans:** The policy does not provide a specific action plan for improving menstrual hygiene management in prisons.

- **Menstrual Hygiene Scheme (MHS):** The Ministry of Health and Family Welfare has launched MHS to promote menstrual hygiene among rural adolescent girls aged **10-19**.
 - The **scheme provides subsidised sanitary napkin packs** to adolescent girls through decentralised procurement, with Accredited Social Health Activist (**ASHA**) workers responsible for distribution and education.
- **Pradhan Mantri Bharatiya Janaushadhi Pariyojana (PMBJP):** **Suraksha Suvridha Napkins (oxo-biodegradable sanitary napkins)** are available at Jan Aushadhi Kendras for **Rs 1 each**.
- **Beti Bachao Beti Padhao (BBBP) (Mission Shakti):**
 - Generating **awareness about menstrual hygiene** and the use of sanitary napkins.
- **Samagra Shiksha:** State-specific projects for menstrual health and hygiene, including the installation of **sanitary pad vending machines and incinerators** in schools.
- **Zero-Napkin Mission:** The zero-napkin mission aims to **replace synthetic napkins with menstrual cups** implemented in Kerala.
 - Due to the **environmental challenges and health issues posed by synthetic napkins**, local bodies in Kerala are distributing menstrual cups and raising awareness about their use.

World Bank Report on Global Water Crisis

Why in News?

The **World Bank's** new report “**Water for Shared Prosperity**,” released at the **10th World Water Forum** in Bali, Indonesia, highlights the alarming **global water crisis** and its implications for human and economic development worldwide.

What are the Key Highlights of the Report?

- **Alarming Water Scarcity Statistics:**
 - Significant gaps exist in access to water and sanitation services globally. As of 2022, **2.2 billion people lack access to safely managed drinking water services** and **3.5 billion lack access to safely managed sanitation**.
 - **Eight out of ten people** without basic drinking water and sanitation services **reside in rural areas**.

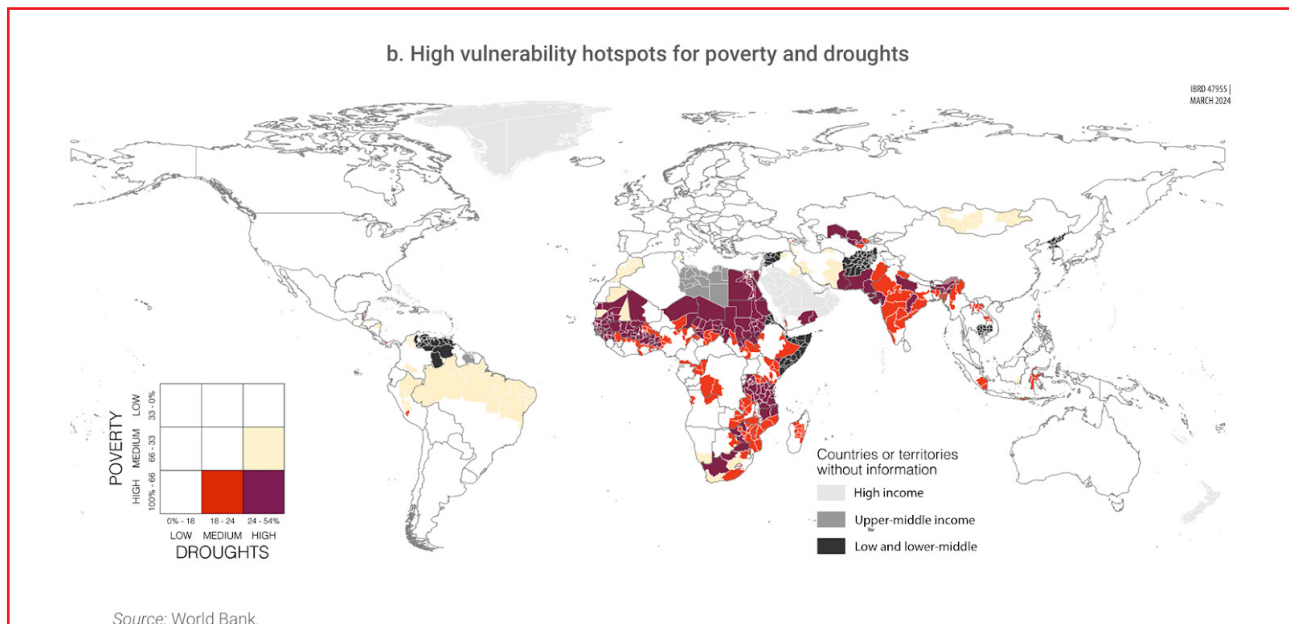
Note:

➤ **Regional Disparities in Access to Water:**

- **Disparity in Freshwater Distribution: China and India**, with 36% of the global population, hold only 11% of freshwater, while North America, with 5% of the population, possesses 52%.
- **Africa and Asia:** The Democratic Republic of the Congo holds over half of Africa's water resources, yet regions like the Sahel, Southeastern Africa, and South and Central Asia remain water-stressed.
- **Low-Income Countries:** These regions have seen a regression in access to safe drinking water, with an **additional 197 million people lacking access since 2000**.
- **Marginalised Groups:** Disparities in access also affect marginalized groups based on gender, location, ethnicity, race, and other social identities.

➤ **Impact of Climate Change:**

- Climate change intensifies water-related risks, with **developing countries facing more severe and prolonged droughts and floods**.
 - Over 800 million people are at high risk of **drought**, and twice as many live in flood-prone areas.
- By 2100, **meteorological drought** is projected to impact 15% more of the global land area, increasing to nearly 50% when considering temperature effects.
 - Central Europe, Asia, the Horn of Africa, **India**, North America, Amazonia, and central Australia will be the most affected.
- Poor populations are more exposed to water-related risks and have limited capacity to adapt, perpetuating a cycle of poverty.



➤ **Human Capital and Economic Growth:**

- Access to water and sanitation services is crucial for educational attainment and overall human capital development.
 - In low-income countries, **56% of jobs are in water-intensive sectors**, which are highly sensitive to water availability.
- In Sub-Saharan Africa, **62% of employment is in water-dependent jobs**, with low rainfall significantly impacting GDP growth.

➤ **Social Cohesion and Conflict:**

- Effective and equitable water management fosters community trust and cooperation, whereas mismanagement can exacerbate conflicts.
- Proper water resource management contributes to peace and social cohesion by promoting inclusivity and reducing tensions.

Note:

- **Recommended Interventions for Sustainable Water Management:**
 - Strengthening resilience to **hydro-climatic risks** for the poorest populations is crucial.
 - Better development, management, and allocation of water resources are necessary.
 - Promoting equitable and inclusive delivery of water services is essential for reducing poverty and increasing shared prosperity.

World Water Forum 2024

- The 2024 World Water Forum (10th WWF) is under the theme of **Water for Shared Prosperity** and is jointly organised by the **Government of the Republic of Indonesia** and the **World Water Council**.
 - The World Water Council, established in 1996 and located in Marseille, is an international organisation with 260 member organisations from **52 countries including India**.
 - Its mission is to gather the international community to advocate for water as a political priority for sustainable and equitable development of the planet.
- The Forum is the **world's largest event organised**, since 1997, every three years with a different host country.
- The Forum provides a unique platform for the water community and key decision-makers to collaborate and make long-term progress commitments on global water challenges to provide clean and fair water for all.

What is the Extent of Water Scarcity in India?

- **India's Water Crisis:** According to the **"Composite Water Management Index"** report by **NITI Aayog (National Institution for Transforming India)**, India is facing its worst water crisis **with nearly 600 million people experiencing high to extreme water stress**.
 - Additionally, 8 million children below the age of 14 in urban India are at risk due to poor water supply.
 - The report also states that **India ranks 120th out of 122 countries in the water quality index, with almost 70% of water being contaminated**.
- **Disproportionate Water Resources:** India has only **4% of the world's freshwater resources**, despite housing a staggering **18% of the global population**. This imbalance creates immense strain on available water.

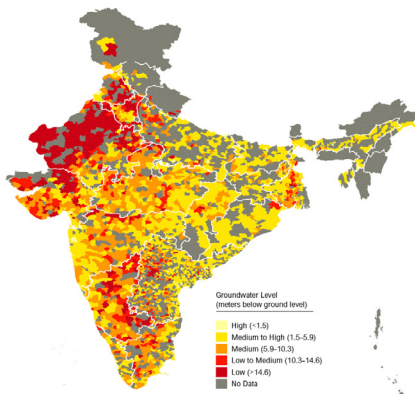
- **Strained Water Availability:**
 - **Declining Groundwater Levels:** The **5th Minor Irrigation Census** conducted by the **Ministry of Jal Shakti** shows that there are **20.52 million wells in the country**, including dug wells, shallow tube wells, medium tube wells, and deep tube wells.
 - India relies heavily on **groundwater**, but extraction rates exceed replenishment. This leads to rapidly declining water tables, raising concerns about future availability.
 - A **2019 Central Ground Water Board** report indicates critical or over-exploited groundwater levels in many areas.
 - **Drying Rivers and Reservoirs:** Seasonal changes and unsustainable water usage **cause rivers and reservoirs to dry up, particularly before the monsoon arrives**.
 - This disrupts water flow and access, especially in the summer months.
- **Threat to Agriculture and Food Security:**
 - **High Water Consumption:** Agriculture accounts for a significant portion of India's water usage. The current **water scarcity threatens food security and agricultural productivity**.
 - **Expected Demand-Supply Gap:** A potential **demand-supply gap of up to 570 billion cubic metres by 2030** in the agricultural sector alone. This gap could lead to food shortages and price hikes.
 - A **2019 World Bank** report estimates that water scarcity in India could lead to a 50% decline in agricultural productivity by 2050
- **Economic Consequences:** A report by NITI Aayog suggests that water scarcity could cost India up to 6% of its GDP by 2050 if left unaddressed.
- **Impact of Climate Change on Water Scarcity:**
 - **Monsoon Rainfall:** India's lifeline, the monsoon season, is becoming increasingly erratic. Studies by the Indian Institute of Tropical Meteorology (IITM) show a decline in average monsoon rainfall by 10% since the 1950s.
 - **Evaporation Rates:** Rising **global temperatures** due to climate change lead to higher evaporation rates.
 - A study published in **Nature** found that the volume of water loss (evaporation volume) of India's natural lakes and reservoirs (artificial lakes) increased at a rate of **5.9% per decade during 1985-2018**.

Note:

- Increased evaporation further reduces surface water availability, drying up rivers, and lakes, and depleting soil moisture, crucial for agriculture.
- **Glacier Melt:** The Himalayas, a source of major rivers like the **Ganges and Indus**, are experiencing rapid glacial melt. While initial melt may seem beneficial, it disrupts natural water flow patterns.
- **Water Crisis in Southern India:** The southern states of India, including Karnataka, Tamil Nadu, Andhra Pradesh, and Telangana, observed a severe water crisis due to **very low water levels in major reservoirs**.
 - Most major reservoirs in these states are filled to only 25% of their capacity or even less, with some notable dams filled to 5% or less.
 - This is primarily due to lower rainfall caused by **El Niño events**, leading to **drought-like conditions and prolonged dry periods**.
 - Additionally, delayed monsoon and post-monsoon deficiency have also contributed to the depletion of water levels.

54%

of India's
Ground-
water
Wells Are
Decreasing



WORLD RESOURCES INSTITUTE

What are India's Initiatives Related to Water Conservation?

- [Atal Mission for Rejuvenation and Urban Transformation \(AMRUT\)](#).
- [Sahi Fasal campaign](#).
- [Swachh Bharat Mission](#).
- [Jal Jeevan Mission](#).
- [Jal Kranti Abhiyan](#).
- [National Water Mission](#).
- [National Rural Drinking Water Programme](#).
- [NITI Aayog Composite Water Management Index](#).

- [Jal Shakti Abhiyan](#).
- [Atal Bhujal Yojana](#).
- [National Water Policy, 2012](#).
- [Pradhan Mantri Krishi Sinchayee Yojana](#).
- [Atal Bhujal Yojana](#).
- [Per Drop More Crop](#).

Early Cancer Detection in India and CRC Tumour Breakthroughs

Why in News?

Recently, a [NITI Aayog \(National Institution for Transforming India\)](#) report highlighted **critical gaps in cancer detection in India**, posing public health risks.

- Meanwhile, researchers in the United States discovered a **distinct subtype of *Fusobacterium nucleatum*** in **colorectal cancer (CRC) tumours**, potentially improving early detection and targeted treatment.

What are the Key Highlights of the NITI Aayog Report on Early Cancer Detection in India?

- The report found a "huge gap" in cancer screening at the [Ayushman Bharat Health and Wellness Centres \(HWCs\)](#), which were meant to offer annual screening for **oral, breast, and cervical cancer** for those aged **30 and above**.
 - Less than **10% of the visited HWCs had completed even a single round of screening for non-communicable diseases**, including cancer.
- While screening for breast cancer was being done through self-examination, the provision for screening for cervical cancer was yet to be operationalised and screening for oral cancer was performed on a case-by-case basis, depending on visible symptoms.
- The report found that the infrastructure and availability of basic devices, medicines, and diagnostic tests at the visited HWCs were by the operational guidelines.
- The report attributed the gaps in cancer screening to "**low levels of awareness**" and "**lack of capacities**" among the HWC staff.
 - The report noted that the required intensive training and careful monitoring of [Auxiliary Nurses and Midwives \(ANMs\)](#) on the three screening methods (oral visual examination, visual inspection with acetic acid, and clinical breast examination) had not happened to the desired extent.

Note:

- The HWC staff also had limited or no knowledge about the need for annual screening for **hypertension** and **diabetes**.

What is an Early Cancer Detection?

- **Cancer is a disease** in which some of the **body's cells grow uncontrollably** and spread to other parts of the body. **Cancer is the second leading cause of death globally**, accounting for **1 in 6 deaths, in 2018**.
- Early cancer detection has two components: **screening and early diagnosis**.
- **Screening:**
 - Refers to testing healthy individuals to **identify those with cancers before any symptoms appear**.
 - **Examples:** mammography or **clinical breast exam for breast cancer**.
- **Early Diagnosis:**
 - Early diagnosis programs focus on **detecting symptomatic patients** as early as possible.
 - This involves increasing awareness of first signs of cancer among healthcare providers and the general public, improving accessibility, affordability, and quality of diagnosis and treatment services are crucial.
 - **Difference Between Early Diagnosis and Screening:** Early diagnosis is relevant for all types of cancer and focuses on symptomatic patients.
 - Screening is relevant only for a subset of cancers (cervical, breast, colorectal) and targets asymptomatic individuals.
- **Challenges and Limitations:**
 - Screening can have **undesirable effects like false-positive results, false-negative reassurance**, and overdiagnosis/overtreatment.
 - The **World Health Organization (WHO)** does not recommend **mammography screening for women under 50** and systematic prostate-specific antigen (PSA) screening for prostate cancer due to **high harm/benefit ratio**.

What are India's Initiatives Related to Cancer?

- **National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke**
- **National Cancer Grid**
- **National Cancer Awareness Day**
- **HPV Vaccine**
- **Ayushman Bharat- Health & Wellness Centres (AB-HWCs)**

What are the Key Highlights of the Study Regarding Colorectal Cancer?

- Researchers isolated *Fusobacterium nucleatum* bacteria from 130 human CRC tumours and mapped their genetic composition.
 - They found that the **subspecies *Fusobacterium nucleatum animalis (Fna)*** was significantly associated with CRC tumors.
 - Fna is composed of two distinct evolutionary lineages or clades, named **Fna C1 and Fna C2**.
 - The Fna C2 clade was significantly associated with CRC tumours and possessed **additional genetic factors that facilitate cancer association**.
- Physically, Fna C2 bacteria are longer and thinner than Fna C1, which may **aid in evading the immune system and colonising host tissues**.
 - Genetically, Fna C2 has genes that allow it to metabolise compounds like ethanalamine and 1,2-propanediol present in the **human gut**.
 - Fna C2 can survive in more acidic conditions, enabling it to descend from the mouth to the gut, which is unusual for bacteria.
 - This challenges the previous belief that *Fusobacterium* reaches the gut only through bloodstream infections.
- The findings could lead to **early CRC diagnostic tests**. Targeted treatments may be developed from Fna C2 characteristics.
- Selectively targeting Fna C2 without affecting other gut bacteria is a significant challenge.

Colorectal Cancer (CRC)

- **Global Burden:** Colorectal cancer, also known as **colon cancer, rectal cancer**, or bowel cancer, is a common type of cancer that affects the colon or rectum.
 - Colorectal cancer is the **third most common cancer worldwide**, accounting for approximately 10% of all cancer cases.
 - It is the **second leading cause of cancer-related deaths globally**.
 - By 2040, the burden of colorectal cancer is projected to increase by 63% in new cases and 73% in deaths.

Note:

- **CRC and India:** CRC is the **seventh most common type of cancer in India**, where the number of cases rose by **20% from 2004 to 2014**.
- **Risk Factors and Prevention:** Risk factors include family history, personal history of colorectal cancer or polyps, and lifestyle factors like an unhealthy diet, lack of physical activity, obesity, smoking, and excessive alcohol consumption.
 - Adopting a healthy lifestyle and regular screening can help prevent colorectal cancer.
- **Symptoms:** Colorectal cancer often has no symptoms in the early stages, highlighting the importance of regular screening.
 - Common symptoms include bowel habit changes, rectal bleeding, abdominal pain and anaemia.
- **Treatment:** Options include **surgery, radiotherapy, chemotherapy, targeted therapy**, and immunotherapy.
 - Treatment plans are tailored based on the specific type and stage of cancer, as well as the patient's medical background.

Packaged Food and Health Concerns

Why in News?

The **Indian Council of Medical Research (ICMR)** and the **National Institute of Nutrition (NIN)** have highlighted the importance of carefully reading **food labels** to avoid health risks.

- Their recent report provides guidelines for healthy eating habits and warns against **deceptive claims on packaged foods**.

What are the Key Recommendations for a Healthier Lifestyle?

- **Moderation in Consumption:** The guidelines emphasise the need to use oil and fats in moderation and reduce the intake of salt and sugar.
 - They aim to lower the risk of **coronary heart disease, hypertension**, and up to **80% of type 2 diabetes** cases can be prevented through a **healthy lifestyle**.
- **Exercise and Physical Activity:** Guidelines emphasise regular physical activity alongside a balanced diet to prevent diseases like **obesity**.

- Reduced physical activity and increased consumption of highly processed **foods exacerbate micronutrient deficiencies and overweight issues**.
- **Dietary Diversity and Nutrient Intake:** The guidelines recommend **sourcing macronutrients and micronutrients** from a minimum of eight food groups to have a **balanced diet**.
 - The aim is to provide all nutritional requirements and prevent micronutrient deficiencies in all age groups.
- **Limiting Ultra-Processed Foods:** The guidelines emphasise the importance of limiting the consumption of **ultra-processed or processed foods** in the diet.
 - These instant food options are **high in sugar, salt, and fat**, which can be harmful to health, contribute to micronutrient deficiencies and exacerbate overweight issues.
- **Informed Food Choices:** The guidelines urge consumers to make a habit of checking food labels to enable them to make healthy food choices.
 - This habit can help prevent obesity by enabling consumers to avoid foods high in sugars, fats, and salts.
- **Avoid Protein Supplements:** The guidelines discourage the use of protein supplements to enhance muscle mass.
 - They note that **dietary protein supplementation provides only a small increase in muscle strength and size**, and the consumption of large amounts of high-protein supplements can lead to **issues like bone mineral loss and kidney damage**.

How can the Guidelines Benefit Populations?

- **Pregnant Women and New Mothers:** Access to additional nutritious food supports overall health for mother and baby, reducing the risk of complications.
- **Infants and Young Children:** Exclusive breastfeeding for six months supports optimal physical and **cognitive development**, followed by introduction of complementary foods.
- **Children and Adolescents:** Balanced diets support learning, growth, and physical activity for optimal development.
- **Elderly People:** Prioritising nutrient-rich foods addresses specific needs like bone health and immune function, improving quality of life.

Note:

How can Packaged Foods be Misleading?

- **Attention-Grabbing Labels:** Packaged foods often use labels designed to catch the consumer's eye and suggest health benefits, which can be misleading.
- **'Natural' Claims:** Processed food, labelled as 'natural', may still contain preservatives and added colours.
 - The term is often loosely used to highlight one or two natural ingredients, leading to consumer confusion. Terms like "natural," "organic," and "sugar-free" can be ambiguous and misinterpreted by consumers, potentially leading to unhealthy choices.
 - Truly organic food should be free of preservatives, flavours, colors, pesticides, and chemical fertilisers. Only products meeting these **criteria should use the 'Jaivik Bharat' logo approved by the Food Safety and Standards Authority of India (FSSAI).**
 - **Making deceptive claims or advertisements** are punishable offences under **Section-53 of the Food Safety and Standards Act, 2006.**
- **Packaged Juice Labels:** According to FSSAI regulations, juices with as little as 10% natural fruit can be labelled as made with real pulp or juice, which can **mislead consumers regarding the actual content.**
- **Fruit Ripening: Calcium carbide use for fruit ripening** can be misleading on packaged foods because fruits ripened this way have health risks associated with it.
 - Calcium carbide releases **acetylene gas**, which contains harmful traces of **arsenic and phosphorus**, substances known as "Masala".
 - These can cause a **range of health issues** such as dizziness, frequent thirst, irritation, weakness, difficulty in swallowing, vomiting, and skin ulcers. Additionally, the **acetylene gas itself is hazardous to those handling it.**
 - Due to these dangers, the use of calcium carbide for ripening fruits has been banned under the **Food Safety and Standards (Prohibition and Restrictions on Sales) Regulations, 2011.**
 - FSSAI has instead permitted the use of "**ethylene gas**" as a safer alternative for fruit ripening in India, as it is a naturally occurring hormone that regulates the ripening process.
- **Contamination of Chemical:** Nepal's recent ban on **certain spice mixes from Indian brands** along with Singapore and Hong Kong raises serious concerns about misleading packaging and potential health risks.

- These products are suspected to be **contaminated with ethylene oxide or EtO contamination, a chemical used for fumigation.**
- **Whole Grain Misrepresentation:** Products may advertise whole grains but contain only a small percentage, with the rest being refined grains.

What is the Status of India's Food Processing Industry?

- **Strong Growth Potential:**
 - The Food processing industry is a **sunrise sector** in India, offering immense investment opportunities.
 - The government actively promotes the sector through the **Ministry of Food Processing Industries (MoFPI).**
- **Government Initiatives:**
 - **Pradhan Mantri Kisan Sampada Yojana (PMKSY)**
 - **Pradhan Mantri Formalisation of Micro Food Processing Enterprises Scheme (PMFME)**
 - **PLI Scheme for Food Processing Industry**
 - Investment-Friendly Environment:
 - 100% **FDI** allowed under automatic route for most food processing sectors.
 - 100% FDI allowed through government approval route for e-commerce of domestically produced food products.
- **Positive Performance Indicators:**
 - Food processing exports surged 13% to USD 19.69 Bn in FY 2022-23.
 - Total FDI inflow into food processing reached USD 12.46 Bn by Dec 2023.
 - The Indian **Food Processing market is projected to reach a massive USD 535 Bn by 2025**, growing at a 15.2% compound annual growth rate (CAGR).

What are India's Efforts to Promote Healthy Eating?

- **PM Poshan SHAKti Nirman (PM-POSHAN)**
- **Poshan Abhiyaan (National Nutrition Mission)**
- **Integrated Child Development Services (ICDS) Scheme**
- **Eat Right Movement**
- **Eat Right Mela**
- **Eat Right Awards**



Note:

Science & Technology

Highlights

- Recombinant Proteins Using Monosodium Glutamate
- Sympatric Speciation
- Working of Anaesthetic Drugs in the Brain
- Space Tourism
- X Chromosome
- Tokyo Atacama Observatory
- China's High Energy Photon Source
- Global Report on Neglected Tropical Diseases 2024
- Amplifying the Global Value of Earth Observation
- GPT-4o

Recombinant Proteins Using Monosodium Glutamate

Why in News?

Researchers at the **Indian Institute of Science (IISc), Bengaluru** have made a significant breakthrough in the mass production of **recombinant proteins** by utilising **Monosodium Glutamate (MSG)**.

- This advancement is crucial for producing essential substances like vaccine antigens, insulin, and monoclonal antibodies.

What are Recombinant Proteins?

- About:
 - Recombinant proteins are proteins engineered in the lab by inserting the **gene coding for the protein into bacterial, viral, or mammalian cells**.
- Production:
 - Typically, these proteins are produced in large bioreactors using the cells of a specific yeast which contains a unique promoter, called the **alcohol oxidase (AOX) promoter**.
 - The AOX promoter can be activated by **methanol** to produce recombinant proteins in large quantities.
 - The process involves inserting the **desired gene next to the AOX promoter**, feeding the **yeast with glycerol or glucose**, and then adding **methanol** to activate protein production.
- Risks with Methanol:
 - It is **highly flammable and hazardous**, requiring stringent safety measures. It can also produce harmful byproducts like **hydrogen peroxide**, which can induce oxidative stress in yeast cells or damage the recombinant proteins.

➤ Monosodium Glutamate (MSG) - a Safer Alternative:

- MSG can activate a different promoter in the yeast genome that codes for an enzyme called **phosphoenolpyruvate carboxykinase (PEPCK)**, leading to protein production similar to the methanol-induced process, without the associated risks.
- MSG is safer and more **environmentally friendly compared to the traditional methanol-induced process**. It can be used in biotech industries to mass-produce valuable proteins, including: milk and egg proteins, baby food supplements, nutraceuticals, and therapeutic molecules.

Methanol

- It is the simplest alcohol (also known as **Wood alcohol or Methyl alcohol**) with the **chemical formula CH₃OH**. It appears as a **colourless, fairly volatile liquid** with a faintly **sweet pungent odour**, and completely mixes with water.
 - Methanol is flammable, light, and poisonous, and its consumption can cause blindness.
- Methanol was first isolated by **Robert Boyle** and is now prepared by the direct combination of carbon monoxide gas and hydrogen in the presence of a catalyst.
 - It is commonly used as a laboratory solvent and as a denaturant additive in the manufacturing of **ethanol**.
- Methanol has various uses, including in **polymers**, production of **hydrocarbons**, and as a fuel for **internal combustion engines**.

Note:

Sympatric Speciation

Why in News?

A recent study from the **Indian Institute of Technology Bombay (IIT-B)** sheds light on the mechanisms of **sympatric speciation**, **challenging** the traditional view that new species can evolve only when populations are isolated by geographic barriers (a process called **allopatric speciation**).

What is Sympatric Speciation?

- **Definition:** Speciation occurs when a group within a species separates from other members of its species and develops its unique characteristics.
 - **Sympatric speciation occurs** when new species evolve from a single ancestral species **while inhabiting the same geographic region**.
- **Allopatric Speciation:** Traditionally, speciation was thought to occur mainly through allopatric speciation, it **occurs when a species separates into two isolated groups due to a geographical barrier**, leading to different development based on their unique habitat or genetic characteristics.
 - **Example:** When the **Grand Canyon formed in Arizona**, it separated a population of **squirrels and other small mammals**, leading to allopatric speciation.
 - As a result, **two separate squirrel species now inhabit** the north and south rims of the canyon.
 - In contrast, **birds** and other species were able to cross the canyon barrier and continue to **interbreed without being divided into separate populations**.

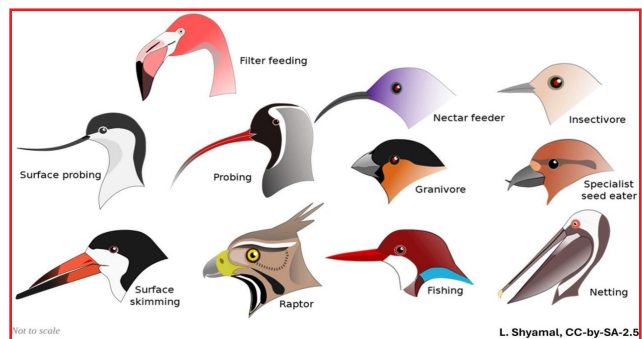
Other Types of Speciation

- **Peripatric Speciation:** It occurs when **small groups break off from a larger group to form a new species**, due to physical barriers preventing interbreeding.
 - The main **difference from allopatric speciation** is that in peripatric speciation, **one group is much smaller than the other**. Unique traits of the smaller group become more common in future generations, **distinguishing it from the others**.
- **Parapatric Speciation:** It occurs when a species is spread out **over a large geographic area**, and **individuals only mate with those in their region**.

- Different habitats influence the development of different species in parapatric speciation. This can happen **when part of an environment is polluted**, leading to the **formation of unique species that are suited to survive** in different environments.

What are the Key Highlights of the Study?

- The study focused on three key factors like **disruptive selection** (where extreme traits are favoured), **sexual selection** (mate choice based on specific traits), and **genetic architecture** (how genes influence traits). Researchers simulated a bird population to understand these processes.
- **Disruptive Selection:** Individuals with **extreme traits have higher fitness** than those with intermediate traits due to non-uniform resource distribution in the environment.
 - **Example:** Birds with small beaks were better suited for food resources like nuts, while those with longer beaks were more efficient at utilising flower nectar as food.
 - Researchers found the disruptive selection, favouring extreme traits based on environmental resource variations, can create a **"divide" within a population without geographic isolation**.
- **Sexual Selection:** Contrary to traditional belief, the study reveals that **sexual selection favouring resource-relevant traits** (e.g., beak size) drives sympatric speciation, not **arbitrary traits like feather colour**.
 - Arbitrary trait-based sexual selection does not lead to speciation. The study also notes potential lower offspring fitness due to sexual selection.
- **Genetic Architecture:** The study found that genetic architecture plays a key role in sympatric speciation likelihood. **Even with weak disruptive selection**, if genetic architecture permits trait changes (e.g., beak size), **new species can emerge**.



Note:

Working of Anaesthetic Drugs in the Brain

Why in News?

Recent research provides new clues into the **mechanism of general anaesthesia** suggesting that these drugs might act primarily on specific brain areas responsible for keeping us alert and awake.

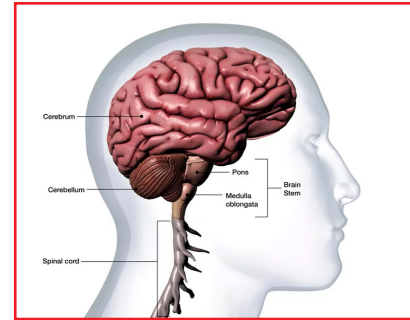
How do Anaesthetic Drugs Work Inside the Brain?

- The **general anaesthetic drugs** have been a cornerstone of modern medicine for over 180 years. Still, there is no thorough understanding of their precise working in the brain.
- The human brain has around **86 billion neurons**, broadly categorised as **excitatory (keeping us awake)** and **inhibitory (regulating excitatory neurons)**.
 - These **work in balance to control consciousness**. Sleep involves **inhibitory neurons silencing excitatory neurons**.
- General anaesthesia mimics sleep by **directly silencing excitatory neurons**, effectively putting us to sleep for surgery.

- **Recent Research Findings:** The study identified **differences in protein expression** between excitatory and inhibitory neurons. These differences may explain why only excitatory communication is disrupted by anaesthesia.
 - Future research aims to identify the **specific protein** variation that makes excitatory neurons more susceptible.

What are the Key Facts About the Human Brain?

- The human brain is the **command centre** for the **human nervous system**.
 - It receives signals from the body's sensory organs and outputs information to the muscles.
 - The **human brain** has the same basic structure as other mammal brains but is **larger in relation to body size** than the brains of many other mammals, such as dolphins, whales and elephants.

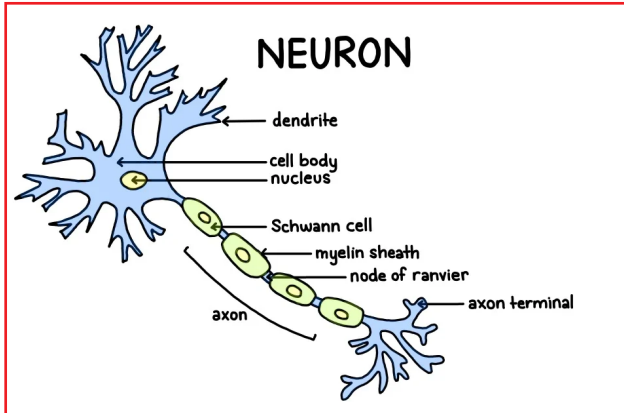


Parts of the Brain	Description	Key Functions
Cerebrum (Largest Part)	Divided into 2 hemispheres	Thought, planning, memory, emotion, movement, and sensory processing.
Thalamus	Relay centre of the brain	To relay motor and sensory signals to the cerebral cortex. It also regulates sleep, alertness, and wakefulness.
Hypothalamus	Connects the nervous system to the endocrine system.	Keeps the body in a stable state called homeostasis
Brainstem	Connects the brain to the spinal cord and controls vital functions.	Relays information between the brain & body. Controls heart rate, breathing, & consciousness (sleep/wake cycles). Sub-Parts: Midbrain, Pons and Medulla oblongata.
Cerebellum	Major structure of the hindbrain.	Coordination, balance, and possibly some cognitive functions.
Cerebrospinal Fluid (CSF)	Clear, colourless, watery brain fluid	Cushioning & Waste Removal

Note:

About Neuron

- Neurons are the **fundamental building blocks** of the nervous system, responsible for **transmitting information** throughout the body.
- **Parts:** They consist of three main parts:
- **Cell body (soma):** Contains the **nucleus** and controls the neuron's functions.
- **Dendrites:** Branching extensions that **receive signals** from other neurons.
- **Axon:** A long, slender fibre that **transmits signals to other neurons**, muscles, or glands. Some axons are covered by a fatty sheath called **myelin**, which speeds up signal transmission.



Space Tourism

Why in News?

Recently, Gopi Thotakura, an India-born commercial pilot based in the US, became the first space tourist from India. She, along with five other space tourists, made a short recreational trip to space.

What is Space Tourism?

➤ About:

- Space tourism is a niche segment of the **aviation industry** that seeks to give tourists an experience of space travel for recreational, leisure, or business purposes.
- Space travel begins at about **100 km** altitude from Earth, after crossing the **Karman line**, which is widely accepted as the boundary line separating the Earth's atmosphere from outer space.
 - Anything flying **below** this altitude is called an **aircraft** while those **crossing this line** get classified as a **spacecraft**.

➤ Types:

- **Suborbital:** Here, flights take passengers to the **edge**

of space, where they can experience weightlessness for a few minutes.

- **Orbital:** Here, flights take passengers **into orbit around the Earth**. This gives them a chance to see the planet from space and experience weightlessness for a longer period of time.

➤ Entry of Private Space Players:

- In 2021, Virgin Galactic's founder Richard Branson and Blue Origin's founder Jeff Bezos first rocketed into space on brief suborbital flights.
- More recently **NASA** funded three companies to develop **commercial space stations**, totaling USD 415M.
 - Blue Origin received USD 130 million, Nanoracks received USD 160 million, and Northrop Grumman Systems Corporation received USD 125.6 million. These developments help support growing demand for space tourism, providing the necessary infrastructure to support it.

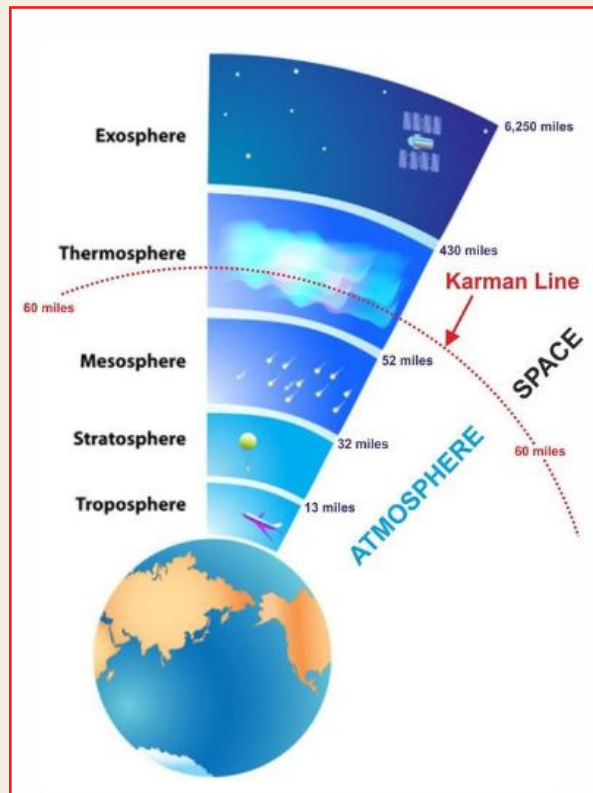
➤ Market Size:

- While the industry is still in its infancy, it is rapidly growing as the demand for space travel is growing, and it is expected to continue to expand at an **annual growth rate of 40.2%** from 2023 to 2030.
- In 2022, the global space tourism market was valued at **USD 695.1 million**, and it is projected to reach **USD 8,669.2 million by 2030**.
- The **sub-orbital segment** dominated the market in 2022, accounting for **49.3%** of the overall market share.
 - The orbital segment, on the other hand, is expected to witness the fastest growth of 41.0% throughout the forecast period.

Note:

Karman Line

- The Karman line is the internationally recognised boundary of space.



- The line is named after **Theodore von Kármán** (1881–1963), a Hungarian American engineer and physicist, who was active primarily in aeronautics and astronautics.
 - He was the first person to calculate the altitude at which the atmosphere becomes too thin to support aeronautical flight and arrived at 83.6 km himself.
- The **Fédération Aéronautique Internationale (FAI)** defines Karman Line as the altitude of 100 kilometres above Earth's mean sea level.
 - **FAI** is the world governing body for air sports, and also stewards definitions regarding human spaceflight.
- However, other organisations do not use this definition. There is no international law defining the edge of space, and therefore the limit of national airspace.

What are Challenges to Space Tourism?

- **Environmental Impact:**
 - Launching spacecraft and rockets require a lot of energy and can produce significant amounts of air and noise pollution.
 - These emissions can contribute to climate change and harm the atmosphere.
- **Safety Concerns:**
 - Despite safety protocols, there is always a risk of a mishap the consequences for which could be catastrophic.
- **Cost:**
 - At present, space tourism is an expensive venture that is accessible only to the wealthy. As a result, many people will not be able to experience space travel, which can create feelings of inequality and elitism.
 - A recent NASA paper mentions that space companies SpaceX and Space Adventures were planning to offer a journey around the Moon for about USD 70 to 100 million (about Rs 600 to 850 crore).
- **Space Debris:**
 - Every launch of a spacecraft generates debris that can stay in orbit for many years, and as the number of space launches increases, the amount of debris grows.
 - This debris can cause problems for other spacecraft, and even small debris can cause damage.
- **Resource Depletion:**
 - Space travel requires a vast amount of resources, including energy, fuel, and materials.
 - The depletion of these resources could have long-term consequences and could negatively impact the environment and the availability of resources for future generations.
- **Legal Issues:**
 - The legal framework for space tourism is still in progress, creating uncertainty about liability if any issues arise.
 - There are also concerns about the impact of space tourism on international space laws and the **Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies**.

Note:

- It is also called **the Outer Space Treaty**. It is a multilateral treaty that forms the basis of international space law, signed in 1967.

What are the Opportunities for India in the Space Tourism Sector?

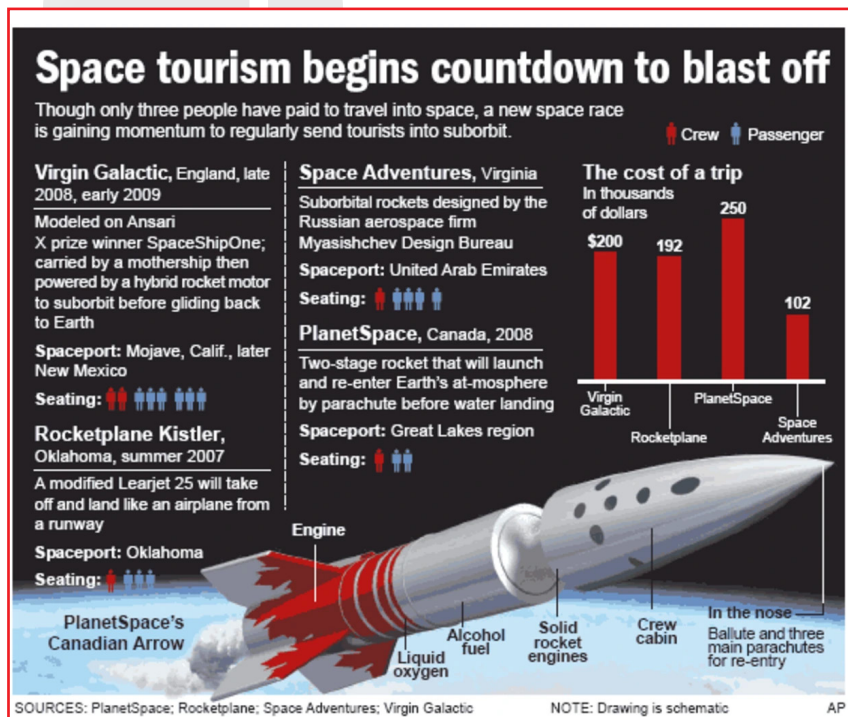
- **Leveraging ISRO's Expertise:**
 - The ISRO has a successful history in space missions, including the Mars Orbiter Mission (MOM), demonstrating its **technological capabilities**. This inspires confidence for future human space endeavours.
 - ISRO's **cost-efficient space programs** could lead to competitive pricing for future space tourism, increasing accessibility for a wider range of participants.
- **Fostering a Thriving Public- Private Space Partnership:**
 - The Indian government is actively **encouraging private participation** in the space sector. Initiatives like **New Space India Limited (NSIL)** by ISRO and **supportive policies** are attracting investments and propelling innovation.
 - **Eg: PSLV-C53** is the first official public-private collaboration for a space launcher in India.
 - Private firms like SpaceX and Blue Origin have demonstrated the viability of such partnerships.
- **Future Plans:**
 - **The ISRO** is also developing a reusable space tourism module for an estimated cost of **Rs 6 crore per trip**, which is expected to be launched **by 2030**.

What is the Future of Space Tourism?

- **Accessible to Wealthy:**
 - By 2030, ISRO predicts that space

tourism will be accessible to the wealthy with an average ticket cost of around 6 crores. ISRO is working towards commercialising space tourism in India in the near future.

- **Beyond Earth's Orbit:**
 - The current focus on suborbital and orbital flights is just the beginning.
 - Companies are already setting their sights on lunar adventures and, ultimately, deep space exploration like missions to Mars such as Mangalyaan (India), Mariner 4(NASA), ExoMars (ESA), Tianwen-1 (China), Hope(UAE).
- **Space Staycations:**
 - The concept of space tourism is expanding beyond brief trips with companies now designing modules for space tourists to stay in for longer periods.
- **Focus on Sustainability:**
 - Greater emphasis will likely be placed on developing fully reusable rockets to minimise space debris and make space travel more environmentally friendly.



X Chromosome

Why in News?

Recent genomic studies have uncovered the significant role of the X chromosome in various biological processes and diseases, particularly **autoimmune diseases and Alzheimer's disease.**

Note:

What is the X Chromosome?

- **About:** The X chromosome is **one of the two sex chromosomes** found in humans and many other organisms. It plays a crucial role in sex determination and carries genes essential for various bodily functions.
- **Sex Determination:** Females typically have **two X chromosomes (XX)**, while males have **one X and one Y chromosome (XY)**.
 - The presence or absence of the Y chromosome determines biological sex.
- **Genes and Functions:** The X chromosome encodes approximately 800 genes that code for proteins involved in diverse biological functions.
 - Loss of function of these genes can lead to a variety of genetic diseases, which can be broadly classified into three categories:
 - X-linked genetic diseases.
 - Diseases influenced by X-chromosome inactivation (XCI) escape.
 - Diseases linked to X-chromosome aneuploidies.
- **X-Linked Genetic Diseases:** It results from **mutations in genes on the X chromosome**.
 - **Males**, having only one X chromosome, **are more likely to express the mutations and develop the disease**.
 - Females, with two X chromosomes, have a **better chance of having a healthy copy of the gene to offset a mutated one**, reducing their risk of developing the full disease.
 - **Examples: Red-green colorblindness** (affecting around 8% of males).
 - **Duchenne muscular dystrophy** (1 in every 3,500-5,000 boys born in India) and **Agammaglobulinemia** (1 in 200,000 live births).
- **X-Chromosome Aneuploidies:** Numerical aneuploidies of the X chromosome can cause certain diseases.
 - Aneuploidy is a genetic condition where an organism has an **abnormal number of chromosomes in its cells**.
 - Human cells typically have 46 chromosomes, 23 from each parent. In aneuploidy, a **cell may have an extra copy of a chromosome (trisomy) or a missing copy (monosomy)**.
 - **Examples:**
 - **Klinefelter syndrome** (characterised by an extra X chromosome, XXY).
 - **Turner syndrome** (loss of one X chromosome in females, X instead of XX).

- **X-chromosome inactivation (XCI) Escape:** In females with two X chromosomes, one X chromosome is randomly inactivated in each cell (except for egg cells) to prevent an imbalance of X-linked genes. **This process is called X-inactivation or lyonization.**
 - Issues like incomplete inactivation (escape) or skewed inactivation can lead to abnormal gene expression, contributing to **X-linked disorders, certain cancers, and autoimmune conditions**.
 - The molecular mechanisms behind XCI were discovered in the 1990s, involving two **non-coding RNAs called Xist and Tsix**.
 - Xist coats and inactivates one of the X chromosomes, while Tsix (reverse of Xist) regulates this process.
 - Recent research has shown that up to a quarter of genes on the X chromosome can escape inactivation and be expressed, even after the XCI process.

How is XCI Linked to Autoimmune Diseases?

- Autoimmune diseases, such as systemic ***lupus erythematosus, rheumatoid arthritis, and Sjögren's syndrome***, are more common in females than males.
- A recent study found that **changing the activity of a gene Xist reactivated other inactive genes on the X chromosome**.
 - This **caused immune system changes** that led to lupus-like symptoms, such as increased autoantibodies and inflammation.
- The findings suggest a link between these gene changes and autoimmune diseases, offering hope for new treatments.

Note: Autoimmune diseases occur when the **body's immune system mistakenly attacks healthy cells** as if they were foreign organisms.

How is the X Chromosome Linked to Alzheimer's Disease?

- Alzheimer's disease exhibits a sex bias, with **women having a higher risk compared to men**.
 - A study suggests that the **gene USP11**, involved in protein modification, escapes X inactivation and is expressed more in females.
 - Increased expression of USP11 encourages the accumulation of tau protein in the brain, contributing to the **development of Alzheimer's disease**.
- This opens new avenues for developing targeted treatments for Alzheimer's disease.

Note:

X Chromosome

1 In the nucleus of each cell, DNA is packaged in thread-like structures called **chromosomes**.

2 Most human cells contain 23 pairs of chromosomes. One set of chromosomes comes from the mother, while the other comes from the father. The twenty-third pair is the **sex chromosomes**, while the rest of the 22 pairs are called **autosomes**.

3 Typically, biologically female individuals have two X chromosomes (**XX**), while those who are biologically male have one X and one Y chromosome (**XY**). However, there are exceptions to this rule.

4 Biologically female people inherit an X chromosome from their father, and the other X chromosome from their mother. Biologically male people always inherit their X chromosome from their mother.

5 The X chromosome is about three times larger than the Y chromosome, containing about 900 genes, while the Y chromosome has about 55 genes.

6 Female mammals have two X chromosomes in every cell. However, one of the X chromosomes is **inactivated**. Such inactivation stops transcription from occurring, hence making sure a potentially toxic double dose of X-linked genes does not occur.

7 An inactivated X chromosome gets condensed into a small, dense structure in the nucleus, and is called a **Barr body**. Barr bodies are commonly used to determine sex.

8 Changes in the structure or number of X chromosomes can lead to a number of diseases. For example, **trisomy X syndrome** is caused by the presence of three X chromosomes instead of two. **Turner syndrome** occurs when women inherit only one copy of the X chromosome.

9 Some women have a rare super color vision trait called **tetrachromacy**, which is linked to the X chromosome. These women can see up to **100 million shades of color** because they have four types of cone cells in their eye instead of the usual three.

10 Contrary to popular belief, **calico** is not a breed of cats, but rather a **distinctive coat color pattern** linked to the X chromosome. Over 95% of calico cats are female. The patches of fur on a calico cat are orange and black, and the color depends on which X chromosome is inactivated within each patch of color.

CELL
23 pairs of Chromosomes

X Chromosome

Sex chromosomes

Sex chromosomes

Mother Y X Father

Children Male Female

X Chromosome

Y Chromosome

ON OFF

Variation in female sex chromosomes

Trisomy X syndrome Turner syndrome

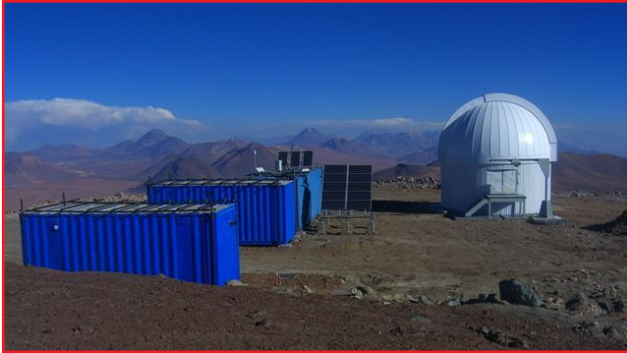
meow?

Note:

Tokyo Atacama Observatory

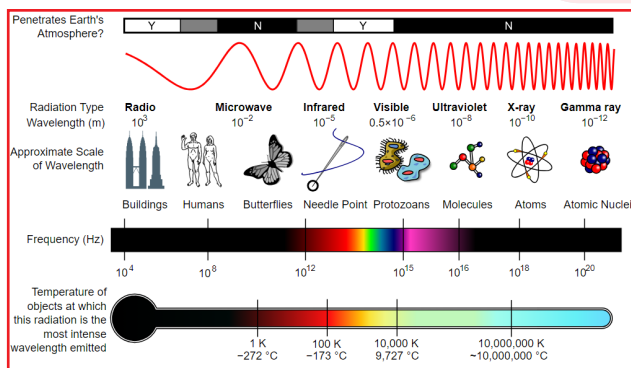
Why in News?

The **University of Tokyo Atacama Observatory (TAO)** has recently been inaugurated. It is now the highest astronomical observatory (altitude of 18,500 feet) in the world, even surpassing the famous **Atacama Large Millimeter Array (ALMA)**, which stands at 16,570 feet.



What is the Tokyo Atacama Observatory?

➤ **About:** The TAO telescope, measuring 6.5 metres in optical-infrared capacity, is perched at an altitude of 18,500 feet on **Mount Chajnantor** in Chile's **Atacama Desert**.



- Co. Chajnantor is located in the **Andes Mountains** near the Atacama Desert.
- The **Atacama Desert** is one of the best locations on Earth for astronomical observations due to its **high altitude, low humidity, and clear skies**, which provide excellent conditions for studying the cosmos.
- The area's **elevated altitude, sparse atmosphere, and consistently dry weather** make it perfect for observing nearly the full spectrum of **near-infrared wavelengths**.

- **Infrared radiation** has a wavelength longer than visible light but shorter than microwaves.

- **Instruments:** TAO's **6.5-meter telescope** is equipped with **2 science instruments** designed for infrared observations.
- **SWIMS (Simultaneous-colour Wide-field Infrared Multi-object Spectrograph):** Aimed at understanding the evolution of galaxies.
- **MIMIZUKU (Mid-Infrared Multi-field Imager for gaZing at the UnKnown Universe):** Used to study planet formation and the origin of materials.

What are Some Other Major Observatories in India and Around the World?

- India:
 - **Giant Metrewave Radio Telescope**, Pune (Maharashtra)
 - **Kodaikanal Solar Observatory**, Kodaikanal (Tamil Nadu)
 - **Indian Astronomical Observatory (IAO)**, Hanle (Ladakh)
- Other International Observatories:
 - **Mauna Kea Observatories (Hawaii, USA)**
 - **Kitt Peak National Observatory (Arizona, USA)**
 - **Mount Wilson Observatory (California, USA)**
 - **Square Kilometre Array Observatory**

Note: The **Square Kilometre Array Observatory (SKAO)** is an international organisation in charge of building the world's largest radio telescope.

- It will be a next-generation radio astronomy facility designed to study the Universe's evolution and answer profound questions about **dark matter, dark energy, and the formation of galaxies**.
- It will be composed of two large telescope arrays deployed in **South Africa and Australia**.
- Countries like the **UK, Australia, South Africa, Canada, China, France, India, Italy, and Germany** are involved in its development.
 - India has played a crucial role in developing the **Telescope Manager software**, which controls the telescope's operations.

Read More: **ALMA Telescope**.

Note:

China's High Energy Photon Source

Why in News?

China is on the brink of a major scientific breakthrough with the construction of the **High Energy Photon Source (HEPS)**, a state-of-the-art fourth-generation synchrotron light source.

- This development places China among a select group of nations capable of producing some of the **brightest X-rays in the world**.

Note:

- A synchrotron is a large circular machine the size of a football field that produces **intense beams of light using high-energy electrons** forced to travel in a circular orbit inside tunnels with strong magnetic fields.
 - The light is used to reveal the innermost secrets of materials, leading to advancements in medicine, agriculture, and materials science.

What is the HEPS Facility?

- **About:**
 - The High Energy Photon Source (HEPS) located approximately Huairou, this facility is designed to **accelerate electrons up to energies of 6 giga electron volts** within its 1.36-kilometer circumference storage ring.
- Key Features of HEPS:
 - HEPS will produce high-energy X-rays that **can penetrate deep into samples, revealing intricate details at the nanometer scale**.
 - Technical Specifications:
 - **Electron Acceleration:** Up to 6 gigaelectron volts.
 - **Time Resolution:** 10,000 times better than third-generation synchrotrons, enabling measurements in nanoseconds.
 - **Beamlines:** 14 initially, with the capacity to expand up to 90.
 - Scientific Impact:
 - **Nanometre-Scale Probing:** Ability to study molecular and atomic structures in real time.
- Can analyse minuscule samples, including small protein crystals that are challenging for older synchrotrons.

- **Broad Applications:** Will benefit fields such as biomedicine, energy, advanced materials, and condensed-matter physics.
- **Faster Experimentation:** Experiments that took days at older facilities can now be completed rapidly.

Challenges:

- **Beam Stability:** Ensuring the X-ray beam is stable enough for practical use requires meticulous, step-by-step adjustments.
- **Technical Precision:** The process of fine-tuning thousands of components is critical to maintaining the light's brightness and stability.

How does HEPS Compare to Other Synchrotrons?

- **Current Status in China:** HEPS will surpass the Shanghai Synchrotron Radiation Facility, China's most advanced existing synchrotron.
- **Global Context:** Joins the ranks of only a **few fourth-generation synchrotron facilities** worldwide, including:
 - MAX IV Laboratory (Lund, Sweden), Sirius (Campinas, Brazil), Extremely Brilliant Source (Grenoble, France), and Advanced Photon Source (Lemont, Illinois).
- **Synchrotrons in India:**
 - India has **two synchrotron radiation sources** at the Raja Ramanna Centre for Advanced Technology (RRCAT) in Indore.
 - Indus-1:
 - A 450 MeV source that has been operating since 1999 and emits in the soft x-ray and vacuum ultraviolet (VUV) regions.
 - Indus-2:
 - Indus-2 is an **indigenously built third generation Synchrotron Radiation Source (SRS)** with 2.5 GeV energy and 200 mA beam current, operating at Raja Ramanna Centre for Advanced Technology (RRCAT), Indore.
 - It has a provision of 21 beamlines based on bending magnets and additional 5 beamlines based on insertion devices.

Note:



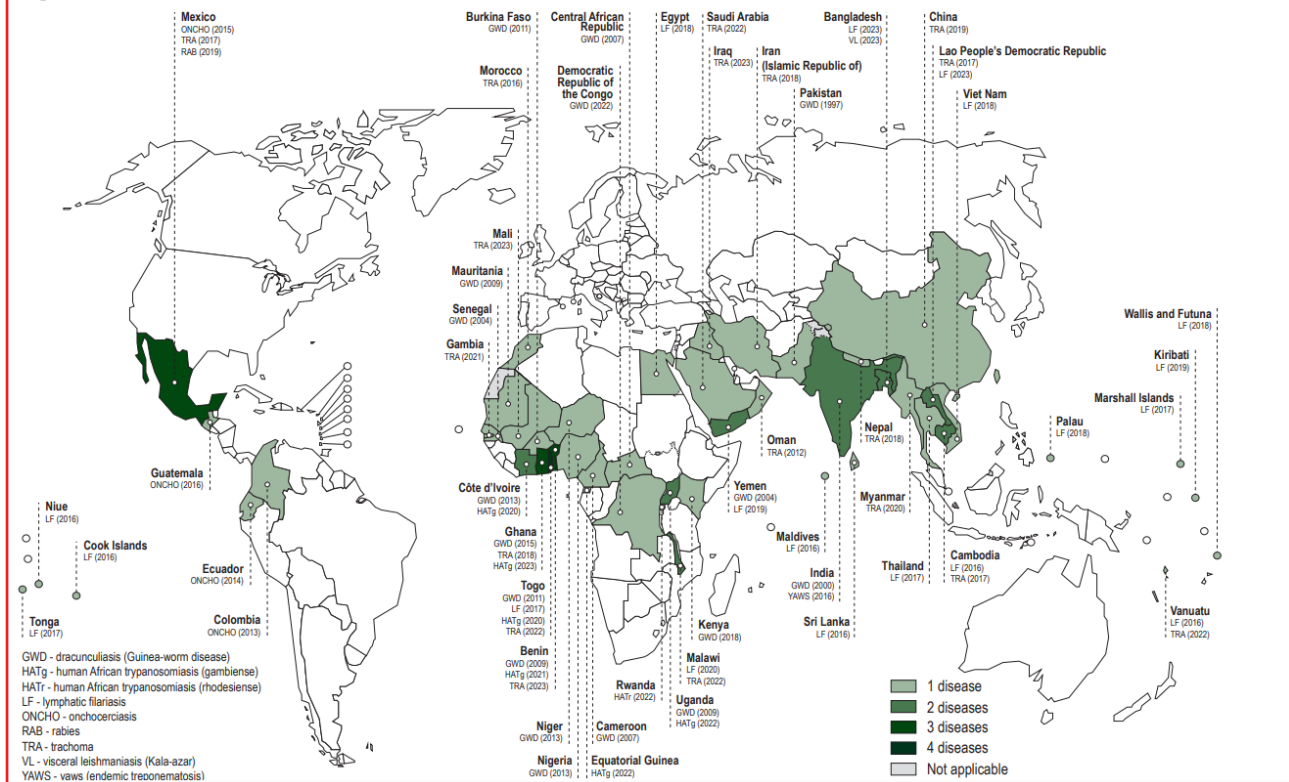
Global Report on Neglected Tropical Diseases 2024

Why in News?

Ahead of the [World Health Assembly](#) 77th session, the [World Health Organization \(WHO\)](#) released its **Global report on neglected tropical diseases (NTD)** of 2024.

- The report provides an account of the progress made in 2023 towards the implementation of the Road map for neglected tropical diseases 2021-2030.

Fig. 2.3. Countries that have eliminated at least one NTD as of December 2023



What are the Key highlights of the WHO Report?

➤ Global:

○ Status for 2023:

- As of December 2023, a total of **50 countries** have successfully eliminated at least one NTD, marking the halfway point towards the 2030 target of 100 countries.
- **5 countries** were acknowledged by [WHO](#) for eliminating **one NTD**, and 1 country for eliminating two NTDs.
- In July 2023, **Iraq** became the **50th country** to eliminate at least one NTD. This event marks the halfway point towards achieving the **100-country target set for 2030**.

- **Noma** was added to the list of NTDs in 2023.
- In October 2023, **Bangladesh** became the **first country** to be validated by **WHO** for eliminating **visceral leishmaniasis** as a public health problem.
- **Status for 2022:**
 - In 2022, **1.62 billion people** required interventions against neglected tropical diseases (NTDs), reflecting a **26% decrease from 2010**, but still dedicated efforts are needed to attain the road map's global target of a 90% reduction by 2030.
 - In 2022, approximately **848 million people** received treatment for at least one NTD through **preventive chemotherapy interventions**, 49 million fewer than in 2021 but 50 million more than in 2020.

Note:

- As of the end of 2022, the number of **reported deaths from vector-borne NTDs** has increased by **22%** (as compared with 2016).

➤ India:

- India was certified free of **NTDs like dracunculiasis and yaws**.
- India, which has the highest disease burden, treated about 117 million fewer people for lymphatic filariasis and soil-transmitted helminthiasis in 2022 compared to 2021.
- 40.56% of India's population needed interventions against NTDs in 2022.
- **Key challenges** highlighted in the report include **slow post Covid-19 recovery**, **funding uncertainties**, **geopolitical disruptions**, **climate change**, gaps in knowledge and tools, and insufficient data in addressing NTDs.

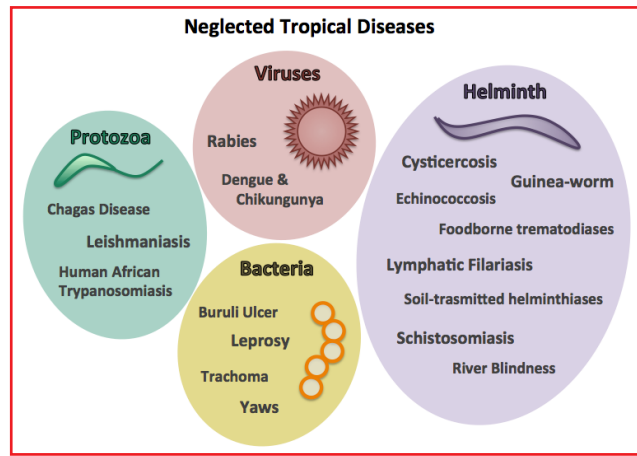
What are the Key Facts About Neglected Tropical Diseases (NTDs)?

➤ About:

- According to WHO, **Neglected tropical diseases (NTDs)** are a **diverse group of conditions** caused by a variety of pathogens (including **viruses, bacteria, parasites, fungi and toxins**) and are associated with devastating health, social and economic consequences.
- NTDs are **mainly prevalent among impoverished communities in tropical areas**, although some have a much larger geographical distribution.

➤ Factors Contributing to these Diseases are Being "Neglected":

- The **epidemiology of NTDs** is **complex** and often related to environmental conditions.
 - Epidemiology is the study of the determinants, occurrence, and distribution of health and disease in a defined population.
- Many of them are vector-borne, have animal reservoirs and are associated with complex life cycles.
- Compared to diseases like **HIV/AIDS**, malaria, and **tuberculosis**, **NTDs receive significantly less funding** for research and development of treatments.



What are the Global and Indian Initiatives to tackle NTDs?

➤ Global Initiatives:

- **WHO's 2021-2030 Roadmap:** This ambitious plan prioritises **impact** over simply treating NTDs. It emphasises collaboration across healthcare, sanitation, and communities. Additionally, it encourages countries to take ownership of their NTD programs.
- **2012 London Declaration:** This international agreement recognises the global burden of NTDs and promotes a unified approach to eliminate them.

➤ Indian Initiatives:

- **Elimination Programs:** India has successfully **eliminated guinea worm, trachoma, and yaws**. The **Accelerated Plan for Elimination of Lymphatic Filariasis (APELF)** aims to achieve the same for this disease by 2027.
- **WHO Collaborations:** India partners with WHO in regional alliances. For instance, a 2005 initiative with **Bangladesh and Nepal focuses on early diagnosis and treatment of Kala-azar**.
- **Mass Drug Administration (MDA):** This program involves regular distribution of free anti-parasitic medication in high-risk areas to prevent **NTD transmission**.
- **Vector Control:** Programs like **Indoor Residual Spraying** target insect breeding grounds to prevent the spread of NTDs like Kala-azar.
- **Financial Assistance:** Wage compensation schemes help individuals affected by NTDs, particularly those with Post-Kala Azar Dermal Leishmaniasis, manage the financial burden of their illness.

Note:

Amplifying the Global Value of Earth Observation

Why in News?

Recently, a new report titled “**Amplifying the Global Value of Earth Observation**” by the **World Economic Forum** has shed light on the immense potential of **Earth Observation (EO) data** to drive economic growth and sustainability worldwide.

Note: Earth observation data involves collecting, analysing, and presenting information about the Earth’s physical, chemical, and biological systems using remote sensing technologies.

- It involves acquiring information about the Earth’s surface, such as land cover, oceans, agriculture, and forestry, through energy emission and processing of reflected images.
- It is achieved through **remote sensing**, which is a **geospatial technology** that collects data about an object, place, or phenomenon without making physical contact with it.

What are the Key Highlights of the Report?

- **Potential Economic Impact of EO Data:** EO data could generate over **USD 3 trillion** in economic benefits globally by 2030.
 - The global value of EO data is expected to grow from USD 266 billion currently to over USD 700 billion by 2030.
 - This could contribute a cumulative USD 3.8 trillion to the **global Gross Domestic Product (GDP)** by 2030.
- **Environmental Benefits:** EO data can help eliminate **2 gigatonnes of greenhouse gas emissions** annually by 2030.
 - This is equivalent to the estimated combined annual emissions of **476 million gasoline-powered cars**.
 - EO can monitor climate variables, emissions, ecosystems, and biodiversity to inform actions to mitigate **climate change** and protect natural habitats.
- **Regional Opportunities:** The **Asia Pacific region** is poised to capture the largest share of EO’s value by 2030, reaching a potential value of USD 315 billion.
 - **Africa and South America** are positioned to realise the largest percentage growth in EO data value.

- **EO Blended with Enabling Technologies:** Enabling technologies like **artificial intelligence (AI)** and **digital twins** can catalyse the adoption of EO data.
 - A digital twin is a **virtual representation of an object or system that accurately reflects a physical object**. It covers the object’s entire lifecycle, is updated with real-time data, and utilises simulation, machine learning, and reasoning to aid in decision-making.

What are the Key Areas of Application of Earth Observation Data?

- **Environmental Monitoring and Management:** Monitoring **deforestation** and illegal logging activities in the forests like **Amazon rainforest** using satellite imagery.
 - Tracking the **spread of deserts and monitoring desertification** in regions like the **Sahara**.
 - Monitoring the coastal areas and marine ecosystems, such as **coral reef bleaching and oil spills**.
- **Agriculture and Precision Farming:** Using multispectral imagery to monitor crop health, estimate yields, and optimise precision agriculture practices for crops like **wheat, rice, and corn**.
 - Assessing soil moisture levels in agricultural fields and identifying areas requiring irrigation in regions prone to drought.
 - Detecting and mapping the spread of **pests and diseases** affecting crops.
- **Urban Planning and Development:** Mapping urban areas and monitoring urban sprawl in rapidly growing cities like **Shanghai(China) and Mumbai(India)**.
 - Identifying suitable locations for infrastructure development, such as new roads, airports, and housing projects.
 - Monitoring changes in land use patterns and urban growth in megacities like **Tokyo (Japan)**.
- **Natural Resource Management:** Mapping and monitoring mineral resources and mining activities in regions like the **Permian Basin** in the US (second-largest shale gas producing region in the US).
 - Monitoring water resources, such as lakes, rivers, and groundwater levels in areas prone to water scarcity, like parts of **Africa and the Middle East**.
- **Climate Change Studies:** Monitoring changes in glaciers, sea ice, and polar regions, such as the **Arctic and Antarctic**.

Note:

- Tracking global temperatures and atmospheric conditions, including greenhouse gas emissions and their impact on climate.
- **Disaster Management and Emergency Response:** Assessing the extent of damage caused by natural disasters like **hurricanes, earthquakes, and wildfires**.
 - Identifying areas affected by disasters for targeted relief efforts, such as the **2004 Indian Ocean tsunami**.
- **Defence and Security:** Monitoring borders and detecting unauthorised activities, such as illegal border crossings and smuggling operations.
 - Tracking troop movements and military activities during conflicts and tensions, like the **Russia-Ukraine war**.
- **Archaeology and Cultural Heritage:** Identifying and mapping archaeological sites and ancient structures, like the ancient **Maya civilization**.
 - Monitoring the preservation of historical sites and cultural heritage.

How does India handle Earth Observation Data?

- **About:** Earth Observation (EO) data in India plays a crucial role in various applications ranging from disaster management to environmental monitoring.
 - The **Indian Space Research Organisation (ISRO)** has been at the forefront of deploying satellites for EO purposes.
- **Satellites:**
 - ISRO operates a series of **Earth Observation satellites**, including the recent **EOS-07** launched in February 2023, and **EOS-06** in November 2022.
 - These satellites join the well-established fleet of **RESOURCESAT series** for land observation, and **OCEANSAT series** for ocean monitoring, providing a comprehensive suite of space-based tools for studying and managing our planet.
- **EO Platforms:**
 - **VEDAS (Visualisation of Earth Observation Data and Archival System):** **VEDAS** is an initiative by the **Space Applications Centre (SAC)** of ISRO. It provides access to a vast repository of thematic spatial data derived from satellite imagery
 - **Bhuvan:** It is ISRO's geo-platform providing satellite imagery and thematic datasets for India.
 - **MOSDAC (Meteorological and Oceanographic Satellite Data Archival Centre):** It is a data repository for all the meteorological missions of ISRO.

- **Future Projects:**
 - **NASA-ISRO Synthetic Aperture Radar (NISAR):** It is a joint project between the **National Aeronautics and Space Administration (NASA)** and the ISRO to develop and launch an Earth-observing satellite with dual-frequency synthetic aperture radar.
 - The satellite will be the **first radar imaging satellite to use dual frequencies**.
- **Synthetic aperture radar (SAR)** refers to a technique for producing fine-resolution images from a resolution-limited radar system.
 - NISAR's data can help people **worldwide better manage natural resources and hazards**, as well as provide information for scientists to better understand the effects and pace of climate change.

What are the Key Facts About WEF?

- **About:** The World Economic Forum is an international organisation based in **Geneva, Switzerland**, founded by **Klaus Schwab in 1971**.
- **History:** It originally focused on management but expanded to economic and social issues in 1973.
 - In 1973, the **Annual Meeting of the European Management Forum** expanded its focus to include economic and social issues due to events such as the collapse of the **Bretton Woods fixed exchange rate mechanism** and the **Arab-Israeli War**.
 - In 1987, the European Management Forum officially became the World Economic Forum and aimed to provide a platform for dialogue. In 2015, the **Forum was formally recognized as an international organisation**.
- **Annual Meeting:** WEF promotes stakeholder capitalism and hosts the **annual meeting in Davos**, with around 3,000 participants discussing global issues from various sectors including investors, business leaders, political leaders, economists, celebrities, and others.
 - The WEF is largely funded by its partnering corporations, which are generally global enterprises with annual turnovers exceeding **USD 5 billion**.
- **Major Reports:** **Global Competitiveness Report, Global Gender Gap Report, Energy Transition Index, Global Risk Report, and Global Travel and Tourism Report**.

Note:

GPT-4o

Why in News?

Recently, **OpenAI** introduced its latest **large language model (LLM)** called **GPT-4o**, billing it as their fastest and most powerful AI model so far.

What are the Key Highlights About GPT-4o?

- **About:** GPT-4o (“o” stands for “Omni” here) is a revolutionary AI model developed by OpenAI to enhance human-computer interactions.
 - It allows users to **input any combination of text, audio, and image and receive responses in the same formats**, making it a multimodal AI model.
- **Technology Applied:** LLMs are the backbone of GPT-4o. Large amounts of data are fed into these models to make them capable of learning things themselves.
 - GPT-4o differs from its **predecessors by using a single model** to handle text, vision, and audio tasks, eliminating the need for multiple models.
 - **For example**, previous models required separate models for transcription, intelligence, and text-to-speech in voice mode, but **GPT-4o integrates all of these capabilities into a single model**.
 - It can process and understand inputs more holistically, including tone, background noises, and emotional context in audio inputs.
 - GPT-4o excels in areas like **speed and efficiency**, responding to queries as fast as a human does in conversation, in around 232 to 320 milliseconds.

➤ Key Features and Abilities:

- Enhanced audio and vision understanding allow GPT-4o to process tone, background noises, and emotional context, and identify objects.
- GPT-4o demonstrates significant advancements in handling non-English text, catering to a global audience.

➤ Safety Concerns:

- Despite its advancements, GPT-4o is still in the early stages of exploring unified multimodal interaction, with ongoing development required.
- OpenAI emphasises built-in **safety measures and continuous efforts to address risks like cybersecurity, misinformation, and bias**.

Large Language Model (LLM)

- A LLM is an AI program capable of recognising and generating text. LLMs are trained on vast datasets using **machine learning and deep learning**, particularly transformer models that mimic the human brain’s neural structure.
- LLMs typically rely on **transformer models**, consisting of an encoder and a decoder. LLMs can be categorised based on architecture, training data, size, and availability.
- LLMs are used for generative AI tasks like producing text, assisting programmers with coding, and **various applications like sentiment analysis and chatbots**.
- They excel at understanding natural language and processing complex data, but can also provide unreliable information or “hallucinate” responses if given **poor input data, and pose security risks if misused**.



Note:

Environment and Ecology

Highlights

- World Wildlife Crime Report 2024
- Sailfin Armoured Catfish
- Paris Agreement Climate Finance Target for 2022
- IUCN Report on Mangrove Ecosystems
- Flamingos, Himalayan Ibex and Blue Sheep
- Olive Ridley Turtle
- Microplastics
- International Atomic Energy Agency (IAEA)
- Initiative to Eliminate Mercury-Containing Medical Devices
- Harnessing Biomass Cultivation on Degraded Land
- Sariska Tiger Reserve
- 19th Session of United Nations Forum on Forest
- Lion-Tailed Macaques
- Issue of Solid Waste Management
- Sundarbans
- Pine Needle Power Projects
- Mining in Aravalli Range

World Wildlife Crime Report 2024

Why in News?

The **UN Office on Drugs and Crime (UNODC)** has recently released the 3rd edition of a report titled the **World Wildlife Crime Report 2024**.

- It provided a comprehensive analysis of the illegal wildlife trade from 2015 to 2021.

United Nations Office on Drugs and Crime

- It was established in 1997 and was named as a United Nations Office on Drugs and Crime (UNODC) in 2002.
- It acts as the Office for Drug Control and Crime Prevention by combining the United Nations International Drug Control Program (UNDCP) and the Crime Prevention and Criminal Justice Division of the United Nations Office at Vienna.

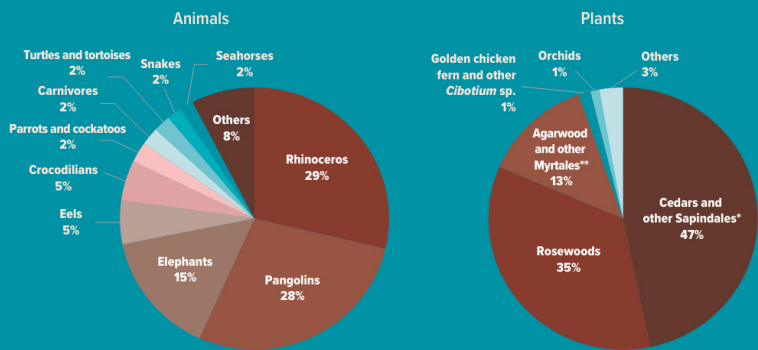
What are the Key Highlights of the Report?

➤ Trafficking in Animal and Plant Products:

- The **rhino (animal)** and the **cedar (plant)** - **most affected** by global illegal wildlife trade during 2015-2021.
 - **Rhino horn** - largest portion of the illegal animal trade at **29%**, followed by **pangolin scales** at 28% and **elephant ivory** at 15%.
- **Other illicitly traded animal species** - Eels(5%), crocodilians(5%), parrots and cockatoos(2%), carnivores, turtles and tortoises, snakes, and seahorses.

Species most affected

Just 15 broad markets comprised the bulk of the observed illegal wildlife trade during 2015–2021 based on standardized seizure index



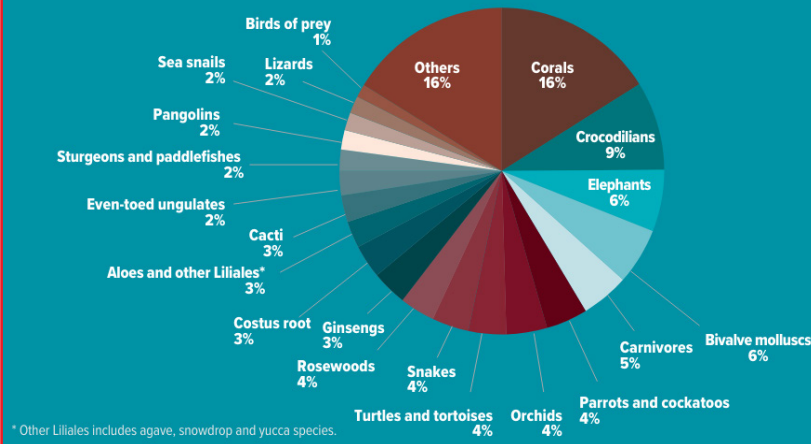
- **Major illegally traded plants** - Cedars and other Sapindales like mahogany, holy wood, and Guaiacum **made up the biggest market at 47%**, followed by rosewoods at 35% and agarwood and other myrtales at 13%.

Note:



Diversity of species recorded in seizures

Percentage share of all seizure records by species group 2015–2021

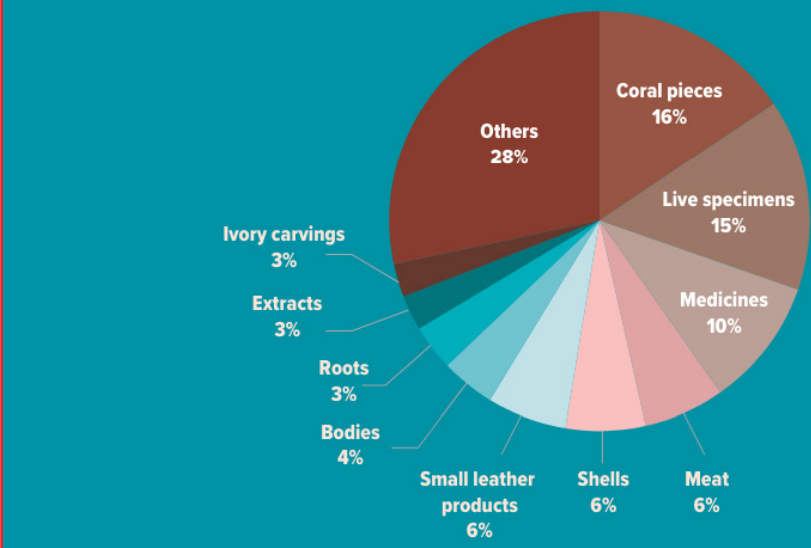


Commodities in Trade:

- Among the commodities, **coral pieces** were found the most and comprised 16% of all seizures during 2015-2016; live specimens - 15%, while medicines made of animal products constituted 10% of all seizures.

Commodities in trade

Top commodities by percentage of seizure records 2015–2021



Bone Processing to Move to the Source Nations:

- Report highlighted that traditionally, bones are processed in destination countries (Far East) but may now be processed closer to where the animals are sourced (Africa, Latin America, Asia).
- This is concerning because it would be easier to traffic as processing like boiling bones into paste makes it easier to smuggle, it would be unknown if this is for local use, export, or both.

- The report notes concerns about substituting lion and jaguar bones for tiger bones, which are highly valued in traditional Chinese medicine.

Off-Track from SDG Goal No.15.7:

- In 2024, the **UNODC** introduced a new indicator to track progress on **SDG target 15.7**, which aims to **stop illegal wildlife trafficking**.
- Rising Illegal Trade suggests that the proportion of illegal wildlife trade compared to all wildlife trade (legal and illegal) has been **increasing since 2017**.
 - The problem worsened during the **Covid-19** pandemic (2020-2021), with **wildlife seizures** reaching their **highest levels at 1.4-1.9%** of global trade.
- Compared to 0.5-1.1% in previous years, the **rise in illegal wildlife trade** suggests the world is not on track to achieve SDG target 15.7 by 2030.

What are the Factors Responsible for Wildlife Crime?

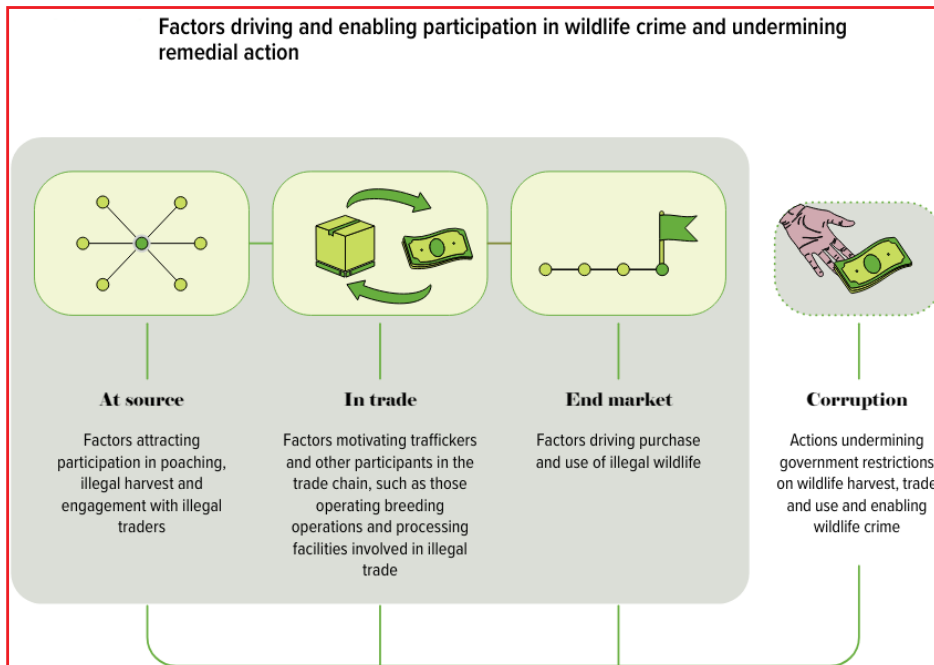
Organised Commercial Illegal Sourcing:

- Organised crime groups are involved in activities such as elephant and tiger poaching, illegal fishing, and logging by operating remotely and often converging with other criminal enterprises, utilising power relationships, corruption, illicit firearms, and **money-laundering** opportunities.
- Throughout the trade chain, organised crime is evident in specialised roles like export, import, brokering, storage, breeding live specimens, and interfacing with processors.

Supplementary Livelihoods and Opportunism:

- While big criminal groups might be behind some trafficking, there are also many poor people who are just trying to make ends meet.

Note:



- Sometimes, **poaching** happens because people are desperate to protect their crops or livestock from wild animals.
- **Black Markets Create New Demands:**
 - When legal uses of a product decline, illegal traders might invent **new ways** to use it to keep selling.
 - For luxury items like rare animals, plants, or endangered species trophies (ivory, big cat skins), scarcity can actually drive up demand in illegal markets, attracting more buyers.
- **Corruption:**
 - It significantly **undermines efforts to disrupt and deter wildlife trafficking**, ranging from bribery at inspection points to higher-level influence on permit issuance and legal decisions.
 - Despite legislation addressing corruption offering strong investigative powers and potentially higher penalties, prosecution of wildlife trafficking organisers under such laws is uncommon.
- **Cultural Roots of Poaching:**
 - People don't just poach wildlife for money as sometimes it's part of their culture; research in the periphery of **Chinko reserve** in the **Central African Republic** revealed that some individuals view elephant hunting as part of their cultural identity, symbolising bravery and manhood, and passed down through generations.

What are the Impacts of Wildlife Crime and Trafficking?

- **Environmental Impacts:**
 - **Species Overexploitation:** Wildlife crime leads to degradation of biodiversity through **overexploitation**, leading to population reductions and extinction threats. Species diversity is vital for functioning ecosystems.

- **Ecological Impact:** Overexploitation of wildlife can lead to long-term ecological problems such as **sex-ratio imbalances** and **slowed reproduction rates**.

- **Population reductions** from trafficking can **disturb species interdependencies** and essential **ecological functions** such as **food chain** and **food web**.

- **Dispersal of Invasive Species:** Illegal wildlife trade can contribute to the **introduction of non-native species into new environments**, potentially leading to **invasive species** that harm native ecosystems and natural resources.

➤ **Social and Economic Harms:**

- **Well-being and Livelihoods:** Wildlife crime, including illegal trade, undermines nature's benefits, impacting food, medicine, energy, and cultural values.

- A **World Bank** study estimated **global economic losses** from illegal wildlife trade at **USD 1–2 trillion per year**, largely from the value of ecosystem services not priced by markets.

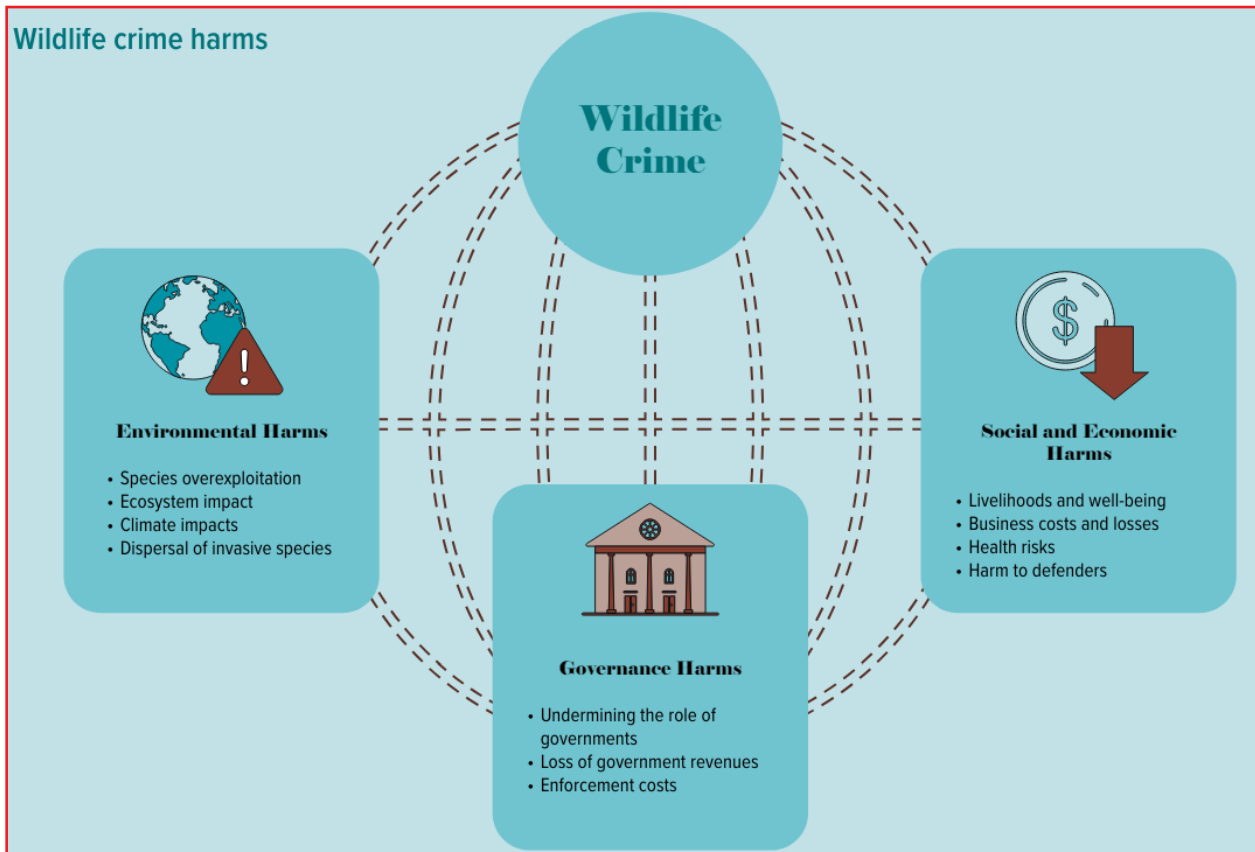
- **Private Sector Costs and Losses:** Wildlife crime harms economies by increasing costs and losses for businesses in the legal wildlife trade and related services.

Note:

- It reduces resource access, causes unfair competition, damages reputations, and incurs extra legality verification costs.
- **Health Risks:** Wildlife trade poses significant risks of **disease transmission** to both humans and animals, as well as **threats to natural ecosystems, livestock, and agricultural systems**.
- **Harm to Environmental Defenders:** Police, customs, wildlife rangers are also vulnerable to harassment, violence by poachers, and even loss of life.
- **Governance Harms:**
 - **Undermining the Rule of Law:** Illegal wildlife trade undermines the rule of law and weakens

natural resource management and criminal justice responses.

- **Corruption** facilitates this trade, compromising legislation and political stability. Additionally, money laundering is linked to wildlife crime, though financial investigations are limited.
- **Loss of Government Revenues:** Wildlife crime causes significant government revenue losses in source countries by evading legal harvest fees, taxes, and tourism income.
- **Financial Costs of Enforcement:** Wildlife crimes have driven increased government spending on conservation, law enforcement, and criminal justice globally.



What Measures Can be Taken to Effectively Reduce Wildlife Crime?

- **Banning Illegal Wildlife Products:**
 - This approach aims to reduce demand by making it illegal to possess or trade goods derived from illegally obtained wildlife.
 - For example, banning ivory products would discourage the killing of elephants for their tusks.
- **Strengthening Domestic Regulations:**
 - Existing laws like the **Wildlife Protection Act (1972)**, **Biological Diversity Act (2002)** and **Environment (Protection) Act (1986)** in India need stricter enforcement and improved implementation across various government levels.

Note:



- Penalties for violating wildlife protection laws should be effectively implemented.
- **Effective Funding for Wildlife Protection:**
 - While funding may exist, better allocation and management of resources are crucial. Funds should directly support wildlife protection agencies like park rangers and anti-poaching units.
 - Additionally, involving local communities in conservation efforts and providing them with financial incentives can increase their participation in preventing wildlife crime.
- **Public Awareness and Empowerment:**
 - Raising public awareness about the consequences of wildlife trafficking is essential. Educating citizens about the value of wildlife and the impact of illegal products can decrease demand.
 - This fosters a sense of responsibility and encourages individuals to report suspicious activity to authorities.

What are the Legal Frameworks for Wildlife Conservation in India?

- **Constitutional Provisions for Wildlife:**
 - The **42nd Amendment Act, 1976** placed the subject of Forests and Protection of Wild Animals and Birds under the purview of both the central and state governments, transferring it from the State List to the Concurrent List.
 - **Article 48 A** in the **DPSP** mandates that the State shall endeavour to protect and improve the environment and to safeguard the forests and wildlife of the country.
 - **Article 51 A (g)** of the Constitution states that it shall be the **Fundamental Duty** of every citizen to protect and improve the natural environment including forests and Wildlife.
- **Legal Framework:**
 - [Wildlife \(Protection\) Act, 1972](#)
 - [Environment Protection Act, 1986](#)
 - [The Biological Diversity Act, 2002](#)
- Global Wildlife Conservation Efforts to which India is a Party:
 - [Convention on International Trade in Endangered Species of Wild Fauna and Flora \(CITES\)](#)
 - [Convention on the Conservation of Migratory Species of Wild Animals \(CMS\)](#)

- [Convention on Biological Diversity \(CBD\)](#)
- [The Wildlife Trade Monitoring Network \(TRAFFIC\)](#)
- [United Nations Forum on Forests \(UNFF\)](#)
- [International Union for Conservation of Nature \(IUCN\)](#)
- [Global Tiger Forum \(GTF\)](#)

Sailfin Armoured Catfish

Why in News?

Recently, scientists from **CSIR-Centre for Cellular and Molecular Biology (CCMB)** have discovered that the **invasive armoured sailfin catfish** has proliferated to 60% of the water bodies in the **Eastern Ghats**, causing harm to **fishing nets** and disrupting the ecosystem.



What are the Key Facts About Sailfin Catfish?

- **About:**
 - The **sailfin armoured catfish**, a collection of several morphologically similar species belonging to the genus **Pterygoplichthys** of the **Loricariidae** from South America, has been widely introduced to **tropical and subtropical freshwater** environments worldwide and has caused **serious ecological impacts**.
 - It is one of the **most serious invasive species**.
 - In India, the fish species was originally introduced for its distinct appearance and its **capacity to remove algal growth** in tanks and aquariums, but its **population** has since **increased dramatically**.
- **Features:**
 - Sailfin catfish have **worm-like dark markings** on the head over a dark-golden background, stout pectoral fins with rough surfaces, and a disc-like, **protrusible mouth** used like a suction cup to attach and feed on algae.

Note:

- Female fish are generally smaller, while those larger than 18 inches are likely to be male.
- **Habitat:**
 - Sailfin catfish live in various slow-moving water bodies and are most commonly found near the shore and in shallow waters.
 - They are known to create **spawning burrows** along shorelines, sometimes undermining canal banks and lake shorelines.
- **Age and Growth:**
 - Grow to more than 20 inches and weigh 3.0 pounds.

eDNA-Based Quantitative PCR Assay

- It is a unique technique developed by the **CSIR-Centre for Cellular and Molecular Biology (CCMB)** to map the presence and spread of invasive species.
 - **Invasive species** when introduced in a new ecosystem can grow rapidly and often lack predators which threatens the new ecosystem and livelihoods depending on it.
- eDNA is **environmental DNA** collected from water samples.
- This technique aids in **the early detection of invasive species**, which greatly contributes to ongoing efforts to manage invasive species and directly benefits the survival of native and economically important fish.
 - Early detection of invasive fish is **essential for preserving ecosystems**, minimising loss of fish catch, and supporting ecological balance.
- The eDNA approach is **reliable, accurate, cost-effective**, and suitable for large landscapes like **Eastern Ghats** water bodies. It can test about 20 waterbodies for invasive species presence in a single lab test.

Paris Agreement Climate Finance Target for 2022

Why in News?

The **Organisation for Economic Cooperation and Development (OECD)** released a report stating that developed countries provided and mobilised more than

USD 100 billion in climate finance to developing countries in 2022, after failing to do so in previous years.

What are the Key Highlights of the OECD Report?

- **Climate Finance Goal:** Developed countries provided and mobilised USD 115.9 billion in climate finance to developing countries in 2022. This achievement comes two years later than the original 2020 target year.
- **Dominance of Public Climate Finance:** Public climate finance from bilateral (countries) and multilateral sources (like the **World Bank**) accounted for **close to 80% of the total financial flow in 2022**. Nearly 90% of financing from **Multilateral Development Banks (MDBs)** was in the form of loans.
 - Bilateral sources provided USD 41 billion, while multilateral sources provided USD 50.6 billion. Mobilised private finance accounted for USD 21.9 billion in 2022.
- **Nature of Financial Instruments:** Loans constituted 70% of public climate finance, raising concerns about debt burdens on developing countries. Grants made up only 28% of the total public climate finance.
- **Distribution by Income Level:** Lower-income countries received **64% of their public climate finance as grants**, whereas lower-middle-income countries received only 13% as grants.
- **Funding for Mitigation vs Adaptation:** Most of the finance went towards **mitigation efforts**, with **adaptation** activities receiving USD 32.4 billion in 2022.
- **Expert Concerns and Recommendations:** Experts called for more transparent accounting and a clear definition of climate finance.
 - Critics argue that the heavy reliance on loans undermines climate justice principles.
 - The **USD 100 billion target is deemed inadequate** compared to the estimated **USD 1 trillion needed annually by 2030** for developing nations to effectively combat **climate change**.

Note:

CLIMATE FINANCE

Climate finance refers to local, national or transnational financing—drawn from public/private/alternative sources of financing—to support mitigation and adaptation actions against climate change.

PRINCIPLES OF CLIMATE FINANCE

- ↳ Polluter Pays
- ↳ Common but Differentiated Responsibility and Respective Capability (CBDR-RC)

Multilateral Climate Funds Coordinated by UNFCCC

- ↳ **Global Environment Facility (GEF):** Operating entity of financial mechanism (1994)
- ↳ **Kyoto Protocol (2001):**
 - ↳ **Adaptation Fund (AF):** Gives developing countries full ownership of adaptation projects
 - ↳ **Clean Development Mechanism (CDM):** To carry out emission-reduction projects in developing nations
- ↳ **Green Climate Fund (GCF):** estd. - 2010 (COP 16)
 - ↳ Funds under it - **Least Developed Countries Fund (LDCF)** and **Special Climate Change Fund (SCCF)**
- ↳ **Long-Term Climate Finance:**
 - ↳ **Cancun Agreements (2010):** Mobilize and provide scaled-up funds in short and long term
 - ↳ **Paris Agreement (2015):** Developed nations agreed to establish new collective goal of at least \$100 billion/year by 2025
- ↳ **Loss and Damage Fund (2023) (COP27 & COP28):** Financial assistance to nations most vulnerable and impacted by effects of climate change

Climate Investment Funds (CIFs) under World Bank

- ↳ Clean Technology Fund
- ↳ Strategic Climate Fund

INDIA'S INITIATIVES REGARDING CLIMATE FINANCE

Fund	Objective
<ul style="list-style-type: none"> ■ National Adaptation Fund for Climate Change (NAFCC) (2015) ■ National Clean Energy Fund (2010-11) ■ National Adaptation Fund (2014) ■ Intended Nationally Determined Contributions (INDCs) (2015) ■ Climate Change Finance Unit (2011) 	<ul style="list-style-type: none"> ■ For vulnerable Indian states ■ Advancing clean energy (started with initial carbon tax on industrial coal use) ■ Bridging gap between required and available funds ■ Nationally binding targets adopted under UNFCCC ■ Leads on global climate finance issues

Challenges to Climate Finance

- ↳ Gap between national needs and climate finance under NDCs
- ↳ Least Developed Countries receive much less approved funding in per-capita terms from the multilateral climate funds
- ↳ Slow rate of approvals
- ↳ Failure in securing viability-gap funding



What is the Future of Climate Finance Goal?

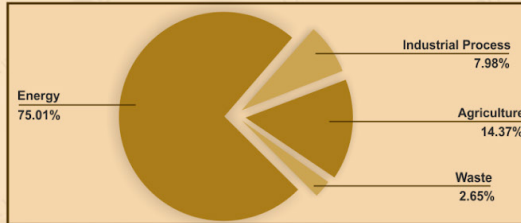
- Negotiations are underway to establish a new, more ambitious **New Collective Quantified Goal (NCQG)** on climate finance. This is expected to be adopted at COP29 summit in Baku, Azerbaijan, in November 2024.
 - Under NCQG developed countries must meet from **2025 onward to provide climate finance to developing countries** and it will supersede the **2015 Paris Agreement**.
- A 2021 report by UN Climate Change estimated that developing countries would need about **USD 6 trillion annually until 2030 to implement their climate action plans**.
 - **India has urged developed countries to provide at least USD 1 trillion per year** in climate finance to developing countries from 2025 to address global warming.

Note:

INDIA'S CLIMATE PROFILE

Sector-wise Contribution

- ↳ **Key Emitting Sectors:** Energy, Transportation, Construction



- ↳ **Key Climate Risks:** Floods, Droughts, Heat Waves, Cold Waves and Cyclones
- ↳ **Vulnerable Sectors:** Agriculture & Food, Water, Coastal, Health, Forests & other natural ecosystems

Key Initiatives for Tackling Climate Change

- ↳ **National Policy Framework**
 - National Action Plan on Climate Change (NAPCC)
 - State Action Plan on Climate Change (SAPCC)
- ↳ **India's Updated Nationally Determined Contributions (2022)**
 - Mass movement for 'LIFE'– Lifestyle for Environment
 - Adopt a climate-friendly and cleaner path for economic development
 - 45% reduction in emissions intensity of GDP by 2030 compared to 2005 levels, aiming for net-zero emissions by 2070
 - 50% cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030
 - Additional carbon sink of 2.5 to 3 billion tonnes of CO₂
 - Better adapt to climate change by enhancing investments in specific sector

- Mobilise domestic and new & additional funds
- Build capacities, create domestic framework and international architecture

International Climate Negotiations - UNFCCC (1994) Convention and Agreements

- Paris Agreement (2015)
- Kyoto Protocol (2005)

Bilateral and Multilateral Cooperation

Bilateral Projects

↳ With Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (Germany)

- Climate Adaptation & Finance in Rural India (CAFRI) (2020-2023)
- Nationally Appropriate Mitigation Actions (NAMAs) (2007)
- Global Carbon Market (GCM) (1997)
- Institutionalisation of Capacities on Climate Change Studies and Action (ICCC)

↳ With European Union (EU)

- Strategic Partnerships for the Implementation of the Paris Agreement (SPIPA) (2018-2022)
- Clean Technologies and Energy Efficiency for Eco-Cities

Multilateral Projects

↳ UN Secretary-General (UNSG) Climate Action Summit (2019)

↳ Global Commission on Adaptation (GCA) (2018)

↳ UNDP: Market Transformation and Removal of Barriers for Effective Implementation of the State-Level Climate Change Action



Drishti IAS

Organisation for Economic Co-operation and Development

- The OECD is an international organisation of **38 democratic countries** committed to the market economy.
- It was established in 1960, by 18 European nations, the United States, and Canada, with **headquarters in Paris, France.**
- The OECD aims to shape policies that foster prosperity, equality, opportunity, and well-being for all, and publishes economic reports, statistical databases, analyses, and forecasts on global economic growth.
- It also works to eliminate bribery and financial crime worldwide and maintains a **“black list” of uncooperative tax havens.**
- Additionally, the OECD has working relationships with **non-member economies like India, in addition to its member countries.**

Note:

IUCN Report on Mangrove Ecosystems

Why in News?

The [International Union for Conservation of Nature \(IUCN\)](#) has issued a new report cautioning that half of the world's mangrove ecosystems are at risk of collapsing. This marks the first comprehensive global assessment of mangroves by IUCN.

- The report, titled “Red List of Mangrove Ecosystems,” unveiled these findings on [International Day for Biodiversity \(22nd May\)](#).

What are the Key Findings of the Study?

- **About:** This study classified the world's mangrove ecosystems in **36 different regions** called provinces and assessed the threats and risk of collapse in each region.
- **Findings:**
 - **More than Half of the Worlds Mangrove Under Risk:**
 - Over **50%** of the world's mangrove ecosystems are at risk of collapse (classified as either vulnerable, endangered, or critically endangered), with nearly 1 in 5 facing severe risk.
 - **One-third** of the world's mangrove ecosystem provinces will be severely affected by **sea-level rise**, with 25% of the global mangrove area predicted to be submerged in the next 50 years.
 - **Higher Risk to South Indian Mangroves:**
 - Mangrove ecosystem in South India, shared with Sri Lanka and Maldives, is categorised as “**critically endangered**”.
 - In contrast, mangrove ecosystems in the Bay of Bengal region (shared with Bangladesh) and the western coast (shared with Pakistan) are classified as “**least concerned**”.
 - **Climate Change as a Major Threat:**
 - A study found that globally, climate change is the major threat to mangrove ecosystems, affecting 33% of mangroves.
- It is followed by deforestation, development, pollution, and dam construction.

- Increased frequency and intensity of **cyclones, typhoons, hurricanes, and tropical storms** are impacting mangroves on certain coastlines.

Global Impact:

- Coasts along the Northwest Atlantic, North Indian Ocean, Red Sea, South China Sea, and Gulf of Aden are **predicted to be significantly impacted**.
- Without increased conservation, about 7,065 sq km (5%) more mangroves could be lost, and 23,672 sq km (16%) **will be submerged by 2050**.

What is the Status of Mangroves Cover in India?

About:

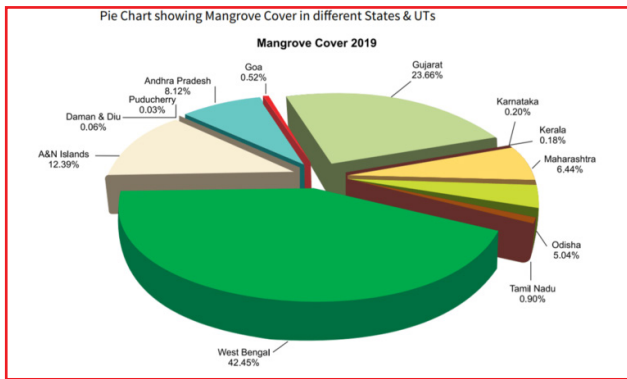
- Mangroves are a unique type of coastal ecosystem found in tropical and subtropical regions. They are **dense forests of salt-tolerant trees and shrubs** that thrive in intertidal zones, where land meets the sea.
- These **ecosystems are characterised by their ability to withstand harsh conditions**, such as saline water, tidal fluctuations, and muddy, oxygen-poor soils.

Mangrove Cover:

- About **40%** of the world's mangrove cover is found in **South East Asia** and **South Asia**.
 - **India** has about **3%** of the total mangrove cover in **South Asia**.
- India's mangrove cover has increased by **54 sq km (1.10%)** compared to the previous assessment.
- The current mangrove cover in India is **4,975 sq km**, which is **0.15%** of the country's total geographical area.
- **West Bengal (42.45%)** has the **largest share of India's mangrove cover**, followed by **Gujarat at 23.66%** and **Andaman & Nicobar Islands at 12.39%**.
 - The **South 24 Parganas** district of West Bengal alone accounts for **41.85% of India's mangrove cover**. This region includes the [Sundarbans National Park](#), one of the largest mangrove forests in the world.
- **Gujarat** has shown the **maximum increase of 37 sq km** in mangrove cover.

Note:





What are India's Initiatives Related to Mangroves Conservation?

- **Coastal Regulation Zone (CRZ) Notification (2019):** This notification under the **Environment (Protection) Act, 1986**, classifies coastal areas including wetlands into four categories. It restricts activities that could damage mangroves, such as:
 - Dumping of waste (industrial or otherwise).
 - Industrial activities within the CRZ.
 - Land reclamation and building in these areas.
- **Central Sector Scheme on 'Conservation and Management of Mangroves and Coral Reefs':**
 - It provides financial assistance to coastal states and union territories for implementing action plans specific to mangrove conservation. These plans can include surveying, alternative livelihoods for local communities, awareness campaigns, etc.
- **Mangrove Initiative for Shoreline Habitats & Tangible Incomes (MISHTI):** Launched in the **2023-24 Union Budget**, MISHTI is a dedicated initiative for promoting and conserving mangroves. It aims to:
 - Increase mangrove cover along the coastline and on degraded lands.
 - Support sustainable development and protect vulnerable coastal areas.
- **Other Relevant Acts:**
 - **The Indian Forest Act, 1927:** States like Maharashtra have designated mangroves on government land as **Reserved Forests**, granting them legal protection under this act.
 - **The Wildlife Protection Act, 1972:** Some mangrove areas are crucial habitats for wildlife and receive protection under this act.

- Additional laws like the **Water (Prevention and Control of Pollution) Act, 1974** and the **Maharashtra Tree (Felling) Act, 1972** offer further protection by regulating activities that could pollute or damage these ecosystems.

How Significant is the Mangroves Ecosystem?

- **Biodiversity Conservation:** Mangroves provide a unique habitat for a wide variety of plant and animal species, serving as breeding, nursery, and feeding grounds for numerous marine and terrestrial organisms.
 - For example, Sundarban hosts the **Royal Bengal tiger**, **Irrawady Dolphin**, Rhesus macaque, Leopard cats, Small Indian civet.
 - **Coastal Protection:** Mangroves act as natural buffers against **coastal erosion**, storm surges, and **tsunamis**.
 - Their dense root systems and tangled network of prop roots stabilise shorelines and reduce the impact of waves and currents.
 - During hurricanes and cyclones, mangroves can absorb and dissipate a significant amount of energy, protecting inland areas and human settlements from devastating damage.
 - **Carbon Sequestration:** Mangroves are highly efficient **carbon sinks**, sequestering large amounts of carbon dioxide from the atmosphere and storing it in their biomass and sediments.
 - **Fisheries and Livelihoods:** Mangroves support fisheries by providing nursery areas for fish and shellfish, enhancing fishery productivity and contributing to livelihood and local food security.
 - **Water Quality Improvement:** Mangroves act as natural filters, trapping and removing **pollutants** and excess nutrients from coastal waters before they reach the open ocean.
 - Their role in purifying water contributes to the health of marine ecosystems and helps maintain the balance of fragile coastal ecosystems.
 - **Tourism and Recreation:** Mangroves offer recreational opportunities such as eco-tourism, birdwatching, kayaking, and nature-based activities, which can promote sustainable economic growth for local communities.
- ### What are the Challenges Faced by the Mangroves Ecosystem?
- **Habitat Destruction and Fragmentation:** Mangroves are often cleared for various purposes, including agriculture, **urbanisation**, aquaculture, and infrastructure development.

Note:

- Such activities lead to the fragmentation and loss of mangrove habitats, disrupting their ecosystem functioning and biodiversity.
- The conversion of mangroves into shrimp farms and other commercial uses is a significant concern.
- **Climate Change and Sea Level Rise:** Rising sea levels due to climate change pose a significant threat to mangroves.
 - Climate change also brings about extreme weather events, such as **cyclones** and storms, which can cause severe damage to mangrove forests.
- **Pollution and Contamination:** Pollution from agricultural runoff, industrial discharges, and improper waste disposal contaminate mangrove habitats.
 - Heavy metals, plastics, and other pollutants adversely affect the flora and fauna of these ecosystems.
- **Lack of Integrated Management:** Often, mangroves are managed in isolation, without considering their interconnectedness with adjacent ecosystems like **coral reefs** and **seagrass** beds.
 - Integrated management approaches that consider the broader coastal ecosystem are necessary for effective conservation.
- **Overfishing and Unsustainable Harvesting:** Overfishing and unsustainable harvesting of mangrove resources, such as fish, crabs, and timber, can reduce their ecological and economic value.
- **Invasive species:** Invasive species, such as the non-native red mangrove, can outcompete

- native species and alter the structure and function of mangrove ecosystems.
- **Lack of awareness and protection:** Mangroves are often undervalued and lack legal protection, which can make them vulnerable to exploitation and destruction.

MANGROVES

Diverse group of salt-tolerant plant communities found in the (tropical/subtropical) coastal intertidal zone

CHARACTERISTICS

- Survive under hostile environments (high salt, low oxygen)
- Their roots (**pneumatophores**) absorb oxygen from atmosphere
- Thick succulent leaves to store fresh water

MANGROVE COVER

- Global: Asia > Africa > North and Central America > S America
- India (ISFR 2021): West Bengal > Gujarat > A&N Islands > Andhra Pradesh > Maharashtra

Sunderbans - World's largest single patch of Mangrove forests

SIGNIFICANCE

- Stabilise the coastline and reduce soil erosion
- Protection against cyclones
- Improve water quality by absorbing nutrients
- Important carbon sink

THREATS

- Commercialisation of coastal areas
- Emergence of shrimp farms
- Temperature fluctuations (Mangroves can't survive freezing temperatures)

CONSERVATION MEASURES

Global	India
<ul style="list-style-type: none"> ■ Inclusion of Mangroves in Biosphere Reserves and UNESCO Global Geoparks ■ Mangroves for the Future Initiative (IUCN & UNDP) ■ Mangrove Alliance for Climate (UNFCCC COP27) 	<ul style="list-style-type: none"> ■ National Mangrove Committee (1976) ■ Mangrove Initiative for Shoreline Habitats & Tangible Incomes (MISHTI) (Union Budget 2023-24)

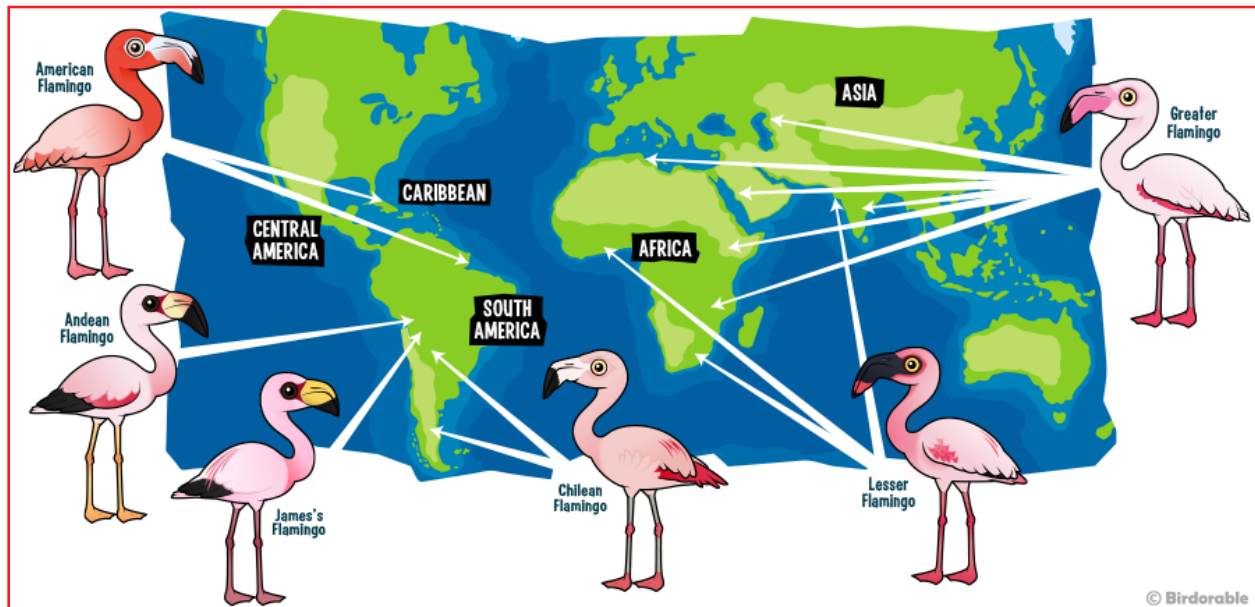
International Day for Conservation of the Mangrove Ecosystem - July 26 (UNESCO)

Flamingos, Himalayan Ibex and Blue Sheep

Why in News?

- Recently, around 39 Flamingos were killed in a collision event with an aircraft landing at the Mumbai airport.
- Since flamingos are a protected species under the **Wildlife Protection Act (1972)**, the rescuers handed over the carcasses of the flamingos to the forest department conducting the necropsy.

Note:



What are the Key Facts About the Flamingos?

- There are 6 flamingo species found around the world namely American Flamingo, Andean Flamingo, Chilean Flamingo, Greater Flamingo, James's Flamingo, and Lesser Flamingo.
- Greater Flamingo:
 - About:
 - It is the **largest and most widespread** flamingo species.
 - These are the **state bird of Gujarat**.
 - They are categorised as “**least concern (LC)**” in the **IUCN Red List of Threatened Species**.
 - These are found in various regions of **Africa**, the southeastern parts of **Asia** as well as **southern Europe**.
 - In Asia, their distribution range includes the **coastal areas of India** and Pakistan.
 - **Northern populations** of these birds **often migrate to warm regions during winter** due to various reasons like scarcity of food, water-level changes, and competition within a single colony.
 - Characteristics:
 - These species form **monogamous pairs** which means each pair remains together for their entire lives.
 - They get their **characteristic pink colour** from their diet of brine shrimps and algae available


in the coastal wetlands. The flamingoes are the **indicators of a healthy coastal environment**.

- These **omnivorous species** feed on molluscs, crustaceans, insects, crabs, worms and small fishes. Their diet also consists of various plant materials such as algae, grass, decaying leaves, and shoots.
- These birds **prefer saltwater lagoons** in coastal areas. They also inhabit large alkaline and saline lakes.
- **Migration Pattern of Flamingo in India:**
 - Experts note that nearly 100,000 to 150,000 flamingos **migrate from Gujarat** (including Kutch and Bhavnagar) and other scattered locations to **Mumbai** each **November** in **search of food**.
 - Upon arrival, they establish themselves in the **Thane Creek area** (breeding grounds for Flamingos).

Survey of Himalayan Ibex and Blue Sheep

- Wildlife authorities in **Himachal Pradesh's Lahaul & Spiti district** are conducting surveys to estimate the population of **blue sheep and Himalayan ibex**, the main prey of snow leopards.
- **Snow leopards**, classified as ‘**vulnerable**’ under the **IUCN Red List** have been increasingly sighted due to the growing population of blue sheep and Himalayan ibex.

Note:

Features	Himalayan Ibex	Blue Sheep (Bharal)
		
Characteristics	Recognized by its contoured horns and beards. Males also tend to be larger in size and more muscular than females	Solitary or in small groups of less than 20 animals which consist of almost entirely one sex.
Distribution	Inhabit upland slopes in a wide range throughout China, from Inner Mongolia to the Himalayas	India, Bhutan, China (Gansu, Ningxia, Sichuan, Tibet, Inner Mongolia), Myanmar, Nepal, Pakistan
Conservation Status	IUCN Red List: Least concerned Wildlife Protection Act 1972: Schedule 1	IUCN Red List: Least Concern Wildlife Protection Act 1972: Schedule 1

Olive Ridley Turtle

Why in News?

Recently, the **traditional Chinese sky lantern festival** has **sparked outrage among environmentalists and wildlife conservationists** as it was scheduled near a nesting site of the **endangered Olive Ridley turtles**.

- As per **environmentalists**, the **bamboo or metal wire frame** of these lanterns takes months to decompose and acts as a **trap for wildlife, fish, dolphins, birds, and turtles**.

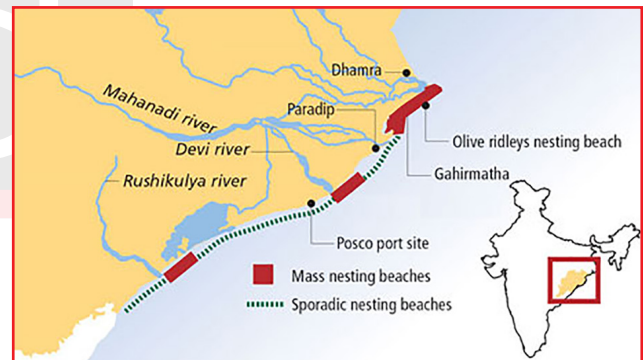
What are Olive Ridley Turtles?

➤ About:

- These turtles are **carnivores** and get their name from their **olive-coloured carapace**.
- They are best known for their **unique mass nesting called Arribada**, where thousands of females come together on the same beach to lay eggs.

➤ Habitat:

- They are **found in warm waters of the Pacific, Atlantic, and Indian oceans**.
- Odisha's **Gahirmatha Marine Sanctuary** is known as the **world's largest rookery** (a colony of breeding animals) of sea turtles.



➤ Protection Status:

- **Wildlife Protection Act, 1972:** Schedule 1
- **IUCN Red List:** Vulnerable
- **CITES:** Appendix I

➤ Initiatives to Protect Olive Ridley Turtles:

- **Operation Olivia:** Every year, the **Indian Coast Guard's "Operation Olivia"**, initiated in the early 1980s, helps protect Olive Ridley turtles as they congregate along the Odisha coast **for breeding and nesting** from November to December.
 - It also intercepts unlawful trawling activities.
- **Mandatory use of Turtle Excluder Devices (TEDs):**
 - To **reduce accidental killing** in India, the Odisha government has made it mandatory for trawls to use **Turtle Excluder Devices (TEDs)**, a net specially designed with an exit cover that allows the turtles to escape while retaining the catch.

Note:



○ **Tagging:**

- The tagging of the Olive Ridley turtles using non-corrosive metal tags is done to enable scientists to **chart their movements** and know the areas they visit to protect the species and their habitats.

Sky Lantern Festival Glowfest

- This sky-lantern festival is celebrated in **China and other Asian countries** that honours **deceased ancestors** on the 15th day of the first month of the lunar calendar.
- This festival aims to promote reconciliation, peace, and forgiveness.
- It is celebrated by **releasing candle-lit paper lanterns into the sky.**

What are the Threats Faced by Olive Ridley Turtles?

- Coastal development projects, such as the **construction of seawalls, resorts, and ports**, destroy nesting beaches and reduce **foraging grounds** for olive ridley turtles.

Few Turtle Species



Loggerhead Sea Turtle

- Species of oceanic turtle
- Spend most of their life in saltwater and estuarine habitat
- IUCN status: **Vulnerable**

Leatherback Turtle

- The largest of the seven species of sea turtles
- Able to maintain high body temperature using metabolically generated heat
- IUCN status: **Critically Endangered**

Green Turtle

- Named after the greenish colour of their cartilage
- Found in tropical and subtropical waters
- IUCN Status: **Endangered**

Olive Ridley Turtle

- Smallest and most abundant of all sea turtles
- Carnivores
- They practice Unique Mass Nesting called Arribada
- IUCN Status: **Vulnerable**

Drishti IAS

#FewTurtleSpecies

Note:

- They are **accidentally caught in fishing gear**, such as gillnets, trawls, and longlines. This can injure or kill the turtles.
- **Raccoons, crabs, birds, and foxes** can raid olive ridley turtle nests and predate on the eggs affecting their population growth.
- Warmer ocean temperatures can also **disrupt the sex ratios of hatchlings**, producing more females.
- They can often **consume plastic bags** in search of foods like for jellyfish, and ingest them, leading to **blockages and starvation**.
- **Artificial lights** from nearby towns and industries can disorient hatchlings, causing them to move away from the sea and towards nearby villages.

Microplastics

Why in News?

Recently, a study revealed the widespread occurrence of **microplastics in the testicles of both humans and canines**, potentially associated with **decreased sperm count**, with polyethylene emerging as the predominant microplastic followed by PVC.

What are Microplastics?

- **About:**
 - They are defined as **plastics less than five millimetres** in diameter. It can be harmful to our ocean and aquatic life.
 - Under the influence of **solar UV radiation**, wind, currents, and other natural factors, plastic fragments into small particles, termed microplastics (particles smaller than 5 mm) or **nanoplastics** (particles smaller than 100 nm).
- **Classification:**
 - **Primary Microplastics:** They are tiny particles designed for **commercial use** and microfibers shed from clothing and other textiles.
 - E.g., microbeads found in personal care products, plastic pellets, and plastic fibres.
 - **Secondary Microplastics:** They are formed from the **breakdown of larger plastics**, such as water bottles.

- Exposure to environmental factors, primarily solar radiation and ocean waves, is the cause of this breakdown.

Applications of Microplastics:

- **Medical and Pharmaceutical Uses:** Used in **targeted drug delivery** due to the capacity to absorb and release chemicals effectively.
- **Industrial Applications:** Used in **air-blasting technology** for cleaning machinery and in the production of synthetic textiles.
- **Cosmetics and Personal Care Products:** Used as **exfoliating agents** in facial scrubs, toothpaste, and other personal care products.

What are the Current Developments Regarding Microplastics?

- **Microplastics in Testicular Tissues:** The study reported mean total microplastic levels of 122.63 µg/g in dogs and 328.44 µg/g in humans, with polyethylene (PE) being the dominant polymer. This discovery raises concerns about the potential impact on human reproductive health, including **declining sperm counts**.
- **Global Plastic Overshoot Day (POD):** In 2024, **POD** is projected to occur on 5th September, marking the point when plastic waste generation exceeds the world's capacity to manage it.
 - By the **end of 2024, 217 countries are expected to release over 3 million tonnes of microplastics into waterways**, with China and India being the top contributors.
- **Microplastics in Drinking Water:** A critical review assessed the quality of 50 studies on microplastics in drinking water and freshwater sources.
 - It highlighted the **need for standardised sampling and analysis methods**, as **only four studies met all the quality criteria**.
- **Microplastic contamination in Ashtamudi Lake:** A study highlights significant microplastic pollution in **Ashtamudi Lake, a Ramsar wetland**, revealing microplastics in fish, shellfish, sediment, and water.
 - Hazardous **heavy metals** like **molybdenum, iron, and barium** were found in microplastics, posing risks to aquatic organisms and humans who consume contaminated fish and shellfish.

Note:

Regulations Related to Microplastics

- **Global:**
 - **United Nations Environment Assembly (UNEA) Resolutions:**
 - The **UNEA** resolution mandated the development of an **international legally binding instrument** on plastic pollution, including in the marine environment.
 - The resolution led to the establishment of the **Intergovernmental Negotiating Committee (INC)** to draft the treaty, to complete negotiations by the end of 2024
 - **United Nations Environment Programme (UNEP) Plastics Treaty:**
 - The UNEP is working on an international legally binding instrument to address plastic pollution, including microplastics.
 - **New Zealand's Waste Minimisation (Microbeads) Regulations:** New Zealand has **banned** the sale and manufacture of wash-off products containing plastic microbeads since 2017.
- **India:**
 - **Ban on Single-Use Plastics**
 - **India Plastics Pact**
 - **Plastic Waste Management Rules, 2016**
 - **Plastic Waste Management (Amendment) Rules 2018**
 - **Plastic Waste Management (Amendment) Rules, 2024**

What are the Challenges Related to Microplastics?

- **Environmental Challenges:**
 - Microplastics are highly persistent in the environment, and their small size allows them to be **transported over long distances**, making them ubiquitous pollutants.
 - Microplastics pose a **threat to wildlife**, especially marine organisms, as their ingestion can result in the bioaccumulation of toxic chemicals.
- **Health Challenges:**
 - Humans are exposed to microplastics through eating, breathing, and skin contact, which are found in tissues like the placenta and can cause health issues like oxidative stress, DNA damage, organ dysfunction, metabolic disorders, etc.

➤ Regulatory and Policy Challenges

- Despite some countries banning microbeads, there's **no worldwide regulation** for all microplastic sources and inconsistent monitoring hampers pollution mitigation efforts.
- Limited resources, inadequate infrastructure, and lack of public awareness impede the effective enforcement of existing regulations.

- **Detection and Analysis Challenges:** Detecting and quantifying microplastics in environmental samples is challenging **due to their diverse properties**.

International Atomic Energy Agency (IAEA)

Why in News?

Recently, the **International Atomic Energy Agency** urged increased caution against the **trafficking of nuclear and radioactive materials**, citing over 4,200 incidents in the past three decades as it began its fourth **International Conference on Nuclear Security (ICONS)** on nuclear security.

What is the International Atomic Energy Agency (IAEA)?


- IAEA is an **intergovernmental organisation** that seeks to **promote the peaceful use of nuclear energy** and to inhibit its use for any military purpose, including nuclear weapons.
 - It was **established in 1957** as the world's "**Atoms for Peace**" organisation within the UN, and governed by its own founding treaty - the **Statute of the IAEA**.
 - It reports to both the **UNGA** and the **UNSC** and is headquartered at the UN Office at Vienna, Austria
 - In 2005, it was awarded the **Nobel Peace Prize** for its work for a safe and peaceful world.
 - The IAEA has 178 member states, India being one of the founding members of it.
- International Conference on Nuclear Security (ICONS):
 - The IAEA's **International Conference on Nuclear Security (ICONS)** is a significant event for the nuclear security community around the world.
 - ICONS 2024 was held at the IAEA Headquarters in Vienna, Austria where the following concerns regarding nuclear waste were highlighted:

Note:

- Currently, 145 states report incidents involving lost, stolen, improperly disposed of, or neglected nuclear or radioactive materials to the IAEA.
- Many radioactive substances are **utilised in medical facilities**, educational institutions, and industries worldwide.
- The main concern is extremists using radioactive materials in a “**dirty bomb**” which, while less deadly than an atomic bomb, could cause mass panic in urban areas.


NUCLEAR WASTE AND ITS DISPOSAL

NUCLEAR POWER



435 NUCLEAR PLANTS WORLDWIDE
10,500 TONNES OF SPENT FUEL PER YEAR

As of 2019, nuclear power plants operate in 30 countries. Six countries have outright bans on use of nuclear reactors to generate electricity.



10% OF THE WORLD'S ELECTRICITY

Nuclear fuel releases many times more energy per gram than fossil fuels. Nuclear plants don't release carbon dioxide while they are operating.

WHAT IS NUCLEAR WASTE?

About 3% of spent nuclear fuel consists of radioactive fission products. In some countries, the spent fuel is reprocessed to separate the waste from uranium and plutonium.

SPENT FUEL COMPOSITION

Uranium-238 (95%)	Uranium-235 (1%)
Plutonium (1%)	Fission Products (3%)

Radioactive waste contains unstable isotopes of elements which decay and emit alpha, beta or gamma radiation. Eventually they decay into non-radioactive elements.

HALF LIVES: UP TO 32 YEARS
Cs-137 Sr-90 Cm-243 Am-241 Co-60

HALF LIVES: 460-24,000 YEARS
Th-229 Pu-239 Pu-240 Am-241 Am-243

HALF LIVES: 77,000-16,000,000 YEARS
Nb-94 I-129 Cs-135 Tc-99 Th-230 Np-237

As well as the radioactivity produced by nuclear waste, it also produces heat as isotopes decay. This poses issues for storage and disposal.

TYPES OF NUCLEAR WASTE

LOW LEVEL WASTE (LLW)

90% of all radioactive waste (by volume)
1% of the total radioactivity of all waste

LLW is defined as not exceeding 4 gigabecquerels per tonne (GBq/t) of alpha activity or 12 GBq/t of beta-gamma activity.

INTERMEDIATE LEVEL WASTE (ILW)

7% of all radioactive waste (by volume)
4% of the total radioactivity of all waste

ILW produces more radiation than LLW, but doesn't generate as much heat as HLW. It includes metal fuel cladding.


HIGH LEVEL WASTE (HLW)

3% of all radioactive waste (by volume)
95% of the total radioactivity of all waste

HLW is defined as producing more than 2 kilowatts per metre cubed of heat due to its radioactivity. It requires shielding during transport and cooling before permanent disposal. It includes used fuel and separated waste.

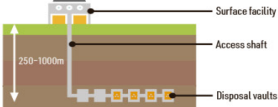
WASTE STORAGE & DISPOSAL

NEAR-SURFACE DISPOSAL



Low level waste's radioactivity is usually compacted into steel canisters and stored in concrete vaults underground. When full, vaults are sealed, covered and left. They ensure no significant radiation reaches the surface.

DEEP GEOLOGICAL DISPOSAL



Intermediate and high level waste generate heat and greater levels of radioactivity. Most countries plan to use deep geological disposal. The rock and soil acts as a barrier to the radiation. Before this, high level waste is incorporated into glass and stored for up to fifty years to allow heat to dissipate.

© Andy Brunning/Compound Interest 2020 - www.compoundchem.com | Twitter: @compoundchem | FB: www.facebook.com/compoundchem
This graphic is shared under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 licence.

Initiatives Related to Safe Radioactive Discharge

➤ International:

- **Convention on Early Notification of a Nuclear Accident:** The 1986 treaty by the **International Atomic Energy Agency (IAEA)** mandates countries to promptly notify any nuclear accidents that could impact other nations.
- **Convention on Nuclear Safety (CNS), 1994:** The **CNS** mandates states to establish and **maintain a regulatory framework** for nuclear safety, ensuring the safety of nuclear power plants and protecting against ionising radiation's harmful effects.
- **Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, 2001:** It is the first IAEA **global agreement** on radioactive waste management, focusing on the safety of spent fuel and waste, accident prevention, and reducing radiological risks.

➤ India's Initiatives:

- **Atomic Energy Regulatory Board (AERB):** **AERB** regulates nuclear and radiation safety, setting and enforcing standards to ensure safe operation of nuclear facilities and manage radioactive discharge in India.
- **Environmental Impact Assessment (EIA):** Before approval, nuclear projects, such as power plants, undergo thorough **environmental impact assessments** that assess potential impacts on the environment and health, including radioactive discharges.
- **Effluent Treatment and Dilution:** Nuclear facilities utilise **effluent treatment** systems to manage liquid radioactive waste, employing dilution and dispersion methods to reduce the concentration of radioactive substances in discharges.

Note:

Initiative to Eliminate Mercury-Containing Medical Devices

Why in News?

The governments of Albania, Burkina Faso, India, Montenegro, and Uganda have united to combat **chemical pollution** by launching a **USD 134-million project** to eliminate the use of mercury in medical devices.

What are the Key Highlights of the Initiative to Eliminate Mercury?

- The initiative is led by **United Nations Environment Programme (UNEP)**, funded by **Global Environment Facility (GEF)**, and executed by **World Health Organisation (WHO)**, aiming to reduce the impact of healthcare on the environment and human health.

- It aims to support global efforts in improving the **management of mercury waste** and promote the use of alternatives.
- The project aims to **phase out mercury-added thermometers and sphygmomanometers** at a **rate of 20% per year**, improving the lives of **over 1.8 million people**.
- **Medical thermometers** and **sphygmomanometers** (devices that measure blood pressure) contain mercury and are harmless as long as they remain intact.
- Instances of breakages and improper disposal of medical devices release **mercury vapour** that **contaminates surroundings both air and water**.
- Inhalation of these mercury vapours can cause **damage to the lungs, kidneys and nervous system**.

What is the Minamata Convention on Mercury Pollution?

MERCURY POLLUTION AND MINAMATA CONVENTION

Mercury

- Symbol - Hg; Atomic No - 80
- **Naturally occurring** element (rocks in earth's crust, deposits of coal),
- Toxic effects on nervous, digestive and immune systems, lungs, kidneys etc.
- One of the top 10 chemicals/groups of chemicals of major public health concern (WHO)

Methylmercury vs Ethylmercury

- Methylmercury (MeHg) is linked to health issues
- Ethylmercury is utilized as a preservative in some vaccines

MERCURY POLLUTION

Sources

- ⊙ Volcanic eruption and weathering of rocks
- ⊙ Artisanal and Small-Scale Gold Mining (ASGM) (**major source**)
- ⊙ Industrial processes (**chlorine production, cement manufacturing** etc)
- ⊙ Improper disposal of **e-waste** (fluorescent bulbs and batteries)

Impact:

- ⊙ MeHg accumulates in aquatic organisms (later consumed by humans)
- ⊙ MeHg carries a **higher risk of causing Minamata disease** (neurological symptoms)

MINAMATA CONVENTION

Objective

- ⊙ Protect human health and environment from adverse effects of Hg and its compounds
- ⊙ Controlling anthropogenic releases of Hg throughout its lifecycle (**key obligation**)

Agreed at

- ⊙ Intergovernmental Negotiating Committee (5th session), Geneva, Switzerland (2013)

Covers Control on

- ⊙ Mercury mining
- ⊙ Manufacture/trade of Hg and related products
- ⊙ Disposal of Hg waste
- ⊙ Emissions of Hg from industrial facilities

Members

- ⊙ 144 parties (India has ratified)
- ⊙ Member countries **bound to put the above controls in place**

Drishti IAS

Note:

What is Mercury?

- **About:** Mercury is a **naturally occurring element** found in the Earth's crust. It is considered by the **WHO** as **one of the top ten** chemicals or groups of chemicals of **major public health concern**.
- **Applications:**
 - Mercury's **high coefficient of thermal expansion** and **easy visibility** make it suitable for use in traditional **thermometers and barometers**.
 - It has been used in **various chemical and mining processes**, including the **production of chlorine and mining of gold**.
 - **Mercury-wetted switches** are used in various electrical applications because of its **conductivity and low resistance**.

Harnessing Biomass Cultivation on Degraded Land

Why in News?

The **Principal Scientific Adviser (PSA)** to the Government of India recently convened the first meeting to discuss **biomass cultivation on degraded land for green biohydrogen production and bioenergy generation**.

- This significant meeting gathered key stakeholders, and research institutes, to explore the potential of utilising degraded, barren, and uncultivated lands for biomass cultivation.

Note: The Government of India established the **Office of the Principal Scientific Adviser (PSA)** in November 1999.

- The PSA's office aims to **provide pragmatic and objective advice to the Prime Minister** and the cabinet in matters of Science and Technology.
- The Office of **PSA was placed under the Cabinet Secretariat** in August 2018.

What are the Key Highlights of the Meeting?

- **Biomass Cultivation Prospects:**
 - **Seaweed Cultivation:** Highlighted prospects for **seaweed cultivation** as biomass for **bioenergy production** and fostering a marine biomanufacturing start-up ecosystem.
 - **Plant-Based Biomass:** Discussed biomass production using various plants, including **algae, molasses, and sugarcane**.

- **Government Programs and Data Utilisation:**
 - Highlighted one of the objectives of the **National Green Hydrogen Mission** is to initiate focused pilots for biomass-based green biohydrogen production.
 - The **Ministry of New & Renewable Energy (MNRE)** highlighted the various programs at the Ministry for Bioenergy and also talked about the **National Biomass Atlas for agri-residue surplus data**.
- **Economic and Strategic Frameworks:**
 - **Data on Biomass:** The **National Remote Sensing Centre (NRSC)**, and **Indian Space Research Organisation (ISRO)**, presented the **Bhuvan portal** for biomass availability from agri-residue and degraded Land Mapping and emphasised the need for data on the characterisation of biomass for understanding the potential of biomass.

Note:

- The **National Biomass Atlas of India** is a tool that helps people understand the **country's biomass availability**.
 - The Biomass and Energy Management Division of the Sardar Swaran Singh National Institute of Bio-Energy (SSS-NIBE) under the Ministry of New and Renewable Energy (MNRE) developed the atlas.
- The atlas shows **state-wise and crop-wise fractions** of different residues available per crop, as well as images of different crops and their crop residue ratios.

What is Biomass Cultivation on Degraded Land?

- **About:** Biomass cultivation on degraded land refers to the **practice of growing organic matter**, such as crops or trees, on land that has been rendered unsuitable for conventional agriculture due to factors like **soil erosion, salinisation, or deforestation**.
 - **Biomass is renewable organic material** that comes from plants and animals. Biomass contains stored chemical energy from the sun that is produced by plants through photosynthesis.
- **Benefits:**
- **Soil Restoration and Erosion Prevention:**
 - The cultivation of energy crops helps rebuild the soil on degraded land and helps improve soil quality, fertility, and structure.
 - It **prevents soil erosion** and creates a habitat for native plant species.

Note:

- This restoration process **improves overall biodiversity** and provides additional carbon sinks, aiding in the fight against climate change.
- **Carbon Sequestration:** Biomass plants absorb carbon dioxide from the atmosphere during photosynthesis, contributing to **climate change** mitigation.
- **Sustainable Biohydrogen Production:** Biomass can be used as a **feedstock for green biohydrogen production** through a process called **thermochemical or biochemical conversion**.
 - Green biohydrogen is a clean-burning fuel that produces water vapour as its only emission.
- **Bioenergy Generation:** By growing specific bioenergy crops on previously degraded or barren land, we can harness their biomass for energy production.
 - These crops include **fast-growing trees, grasses,** and other plants that have high energy content.
 - The biomass can be converted into various forms of energy, such as **biofuels, biogas, or solid biomass**.
- **Enhancing Food Security:** By focusing biomass cultivation on degraded or marginal lands, it avoids using fertile agricultural land, which is better suited for food crops.
 - This approach helps prevent the diversion of food grains and improves **food security while also promoting agri-export**.

India Biomass Energy Potential

- India has a **strong agricultural and allied sector** that contributes significantly to the country's **Gross Domestic Product (GDP)** (~20%) and is also the largest source of livelihood (>50% of the population).
 - This presents a large and **widespread biomass availability to the country**.
- Biomass offers several benefits as it is **renewable, carbon-neutral and has the potential to provide significant livelihood generation opportunities**.
- A recent study by the Ministry of New and Renewable Energy (MNRE), indicated estimated **surplus biomass** availability of about **230 million metric tonnes per annum** (2017-18) from agricultural residues and a **biomass power potential of about 28 GW for the country**.
- **Biomass Production Potential:** India is a tropical country and thus offers an ideal environment for Biomass production.

- Further, the vast agricultural potential, also makes available huge **agro-residues to meet the energy needs**.
 - With an estimated production of about **460 million tonnes of agricultural waste every year, Biomass is capable of supplementing the coal to the tune of about 260 million tonnes**.
 - This can result in a saving of about Rs 250 billion, every year.

What are the Challenges in Biomass Cultivation on Degraded Land?

- **Soil Quality:** Degraded land often **lacks essential nutrients and organic matter**. Rehabilitating soil quality is crucial for successful biomass cultivation.
- **Species Selection and Adaptation:** Selecting appropriate biomass crops that can thrive in harsh conditions is challenging. Research is needed to identify resilient species and improve their adaptability.
 - Degraded land may experience extreme temperatures, **droughts, or floods**.
- **Water Availability and Management:** Degraded land often lacks **adequate water resources**. Developing efficient irrigation methods for biomass crops is essential.
 - Exploring **rainwater harvesting** techniques can enhance water availability.
- **Economic Viability and Market Demand:** Initial investments in land preparation, seedlings, and infrastructure can be high.
 - **Biomass crops must align with market demand for bioenergy** or other products.
 - Governments can encourage farmers through financial incentives. Ensuring economic viability while rehabilitating land is complex.
- **Biodiversity and Ecological Impact:** Introducing biomass crops may affect local ecosystems and biodiversity. Some biomass **crops may become invasive** and disrupt native flora and fauna.
 - Implementing cultivation methods that minimise ecological impact is essential.

Note:

Sariska Tiger Reserve

Why in News?

Recently, the Supreme Court of India clarified that protected areas include not only **national parks and wildlife sanctuaries** but also critical tiger habitats, i.e., tiger reserves.

- This is in the context of its earlier 2023 order that mining within a **national park, wildlife sanctuary**, and within an **area of 1 km** from their boundary shall not be permissible.
- The case in question pertains to the **buffer zone** created to protect the **Sariska Wildlife Sanctuary** in Rajasthan.

What are the Key Facts About the Sariska Tiger Reserve?

- **About:**
 - Sariska Tiger Reserve is located in **Aravali hills** and forms a part of the Alwar District of Rajasthan.
 - It was declared a wildlife sanctuary in 1955 and was declared a **tiger reserve** later in 1978, making it a part of India's **Project Tiger**.
 - It encompasses ruined temples, forts, pavilions and a palace.
 - **Kankarwadi Fort** is located in the centre of the reserve. It is said that **Mughal emperor Aurangzeb** had **imprisoned his brother Dara Shikoh** at this fort in the struggle for succession to the throne.
 - It also houses a famous **temple of lord Hanuman at Pandupole** related to Pandavas.
- **Flora and Fauna:**
 - It is characterised by **rocky landscapes, arid scrub-thorn forests, grasslands, cliffs, and semi-deciduous forests**.
 - It is dominated by **dhok trees, salar, kadaya, gol, ber, banyan, gugal, bamboo, kair, etc.**
 - It also supports a **diverse array of other animals** such as Royal Bengal Tiger, leopards, sambhar, chital, nilgai, four-horned antelope, wild boar, hyenas, and jungle cats.

What are the other Protected Areas of Rajasthan?

- **Desert National Park, Jaisalmer**
- **Keoladeo National Park, Bharatpur**
- **Ranthambore National Park**
- **Sajjargarh Wildlife Sanctuary, Udaipur**
- **National Chambal Sanctuary** (on the tri-junction of Rajasthan, Madhya Pradesh and Uttar Pradesh).
- **Ramgarh Vishdhari Wildlife Sanctuary** (4th Tiger reserve of Rajasthan).



What are Eco-Sensitive Zones (ESZs)?

- **About:**
 - The **National Wildlife Action Plan (2002-2016)** stipulated that state governments should declare land falling **within 10 km of the boundaries of national parks and wildlife sanctuaries** as eco-fragile zones or Eco-Sensitive Zones (ESZs) under the **Environmental (Protection) Act, 1986**.
- **Activities Around ESZs:**
 - **Prohibited Activities:** Commercial mining, sawmills, industries causing pollution, major **hydroelectric projects (HEP)**, commercial use of wood.
 - **Regulated Activities:** Cutting of trees, the establishment of resorts, commercial use of natural water, erection of electrical cables, drastic change of agriculture system, widening of roads.
 - **Permitted Activities:** Ongoing agricultural or horticultural practices, rainwater harvesting, organic farming, use of renewable energy sources.

Note:

- **Significance of ESZs:**
 - ESZs **act as buffer zones** around protected areas. They **regulate activities** around these **core areas**, minimising the negative impacts of development and human intervention.
 - ESZs **help in in-situ conservation**. Example, the conservation of the **One-horned Rhino** of **Kaziranga National Park**, Assam.
 - ESZs help to **maintain wildlife corridors** and reduce instances of **man-animal conflict**, where wild animals enter human settlements in search of food and water.
 - Many ESZs encompass fragile ecosystems like **wetlands, mangroves, and reefs** which are vital for maintaining biodiversity. By regulating activities around these areas, ESZs help to preserve their health and ecological functions.

19th Session of United Nations Forum on Forest

Why in News?

Recently, India participated in the **19th Session** of the **United Nations Forum on Forests (UNFF)** at the UN Headquarters in New York.

- India highlighted its significant **advancements in forest conservation** and sustainable forest management, leading to a **consistent increase in forest cover** over the past fifteen years.

What were the Key Takeaways from UNFF19?

- **India presented its revised National Forest Policy** emphasising forest fire prevention and management through recommendations and technological solutions.
 - According to UNFF, about 100 million hectares of forest or **3% of world's total forest area are affected by fires each year**.
 - India proposes operationalising the **Global Fire Management Hub**, a collaborative effort by the **UNEP** and the **FAO** to share knowledge and experiences in mitigating forest fires.

- India suggests establishing **universally accepted standards like Model Forests Act** for forest certification programs for consistent and responsible forest management practices worldwide.
- The forum **reviewed the UN's strategic plan for forests (2017-2030)** and progress made in achieving global forest goals like **enhancing forests' economic, social, and environmental benefits** and securing finances.
- A UN report highlighted **concerns about "Climatisation" of forests, driven by market-oriented approaches for carbon sequestration**, reducing forests' ecological and social values roles to mere carbon sinks.
- **Indonesia** presented its **Forest and Other Land Use Net Sink 2030 strategy**, and **Malaysia** committed to keeping **at least 50% of its territory under tree cover**.

What were India's Highlighted Initiatives in Forest Management at UNFF19?

- India highlighted its success in using technology to manage forest fires.
 - Examples include **real-time fire monitoring** via remote sensing, online fire reporting through **web portals**, and utilising ecological methods for restoration.
 - Based on the forest inventory records, **54.40% of forests** in India are exposed to **occasional fires**, **7.49% to moderately frequent fires** and **2.40% to high incidence levels**.
- Globally, **India ranks third** in the **net gain of average annual forest area** between 2010 and 2020.
- India completed its **50 years of Project Tiger** and **30 years of Project Elephant**, demonstrating its commitment to species conservation and habitat protection.
- India introduced the '**Green Credit Program**' to incentivise tree plantation and restoration of degraded forest lands to strengthen climate action initiatives.
- In 2023, India hosted the **country-led Initiative under UNFF** at Dehradun, attended by representatives from 40 countries and 20 international organisations, focusing on forest fire management and forest certification.

Note:

What is the United Nations Forum on Forests (UNFF)?

➤ About:

- The UNFF is an **intergovernmental policy forum** that promotes “**management, conservation and sustainable development of all types of forests**.”
- UNFF was **established in 2000** by the **UN Economic and Social Council**.
- The Forum **has universal membership**.

➤ Major Global Forest Related Events:

- **1992:** UN Conference on Environment and Development adopts the “**Forest Principles**” and **Agenda 21**.
- **1995: Intergovernmental Panel on Forests (1995)** was established to implement the **Forest Principles** from 1995 to 2000.
- **2000:** UNFF is established as a **functional commission** of the UN Economic and Social Council.
- **2006:** UNFF agrees on **four Global Objectives on Forests**.
 - Reverse the loss of forest cover worldwide through sustainable forest management (SFM);
 - Enhance forest-based economic, social and environmental benefits;
 - Increase significantly the area of sustainably managed forests;
 - Reverse the decline in official development assistance for SFM
 - Mobilise increased financial resources for implementation of SFM.
- **2007:** UNFF adopts the **UN Non-Legally Binding Instrument on All Types of Forests (Forest Instrument)**.
- **2011: The International Year of Forests, “Forests for People”**.

What are the Key Facts About the Indian Forest Policy?

➤ The National Forest Policy, 1894 (Colonial Focus):

- The policy **prioritised timber production** and custodial management.
- **Forest classification was introduced**, with emphasis on protecting commercially valuable areas.

➤ The National Forest Policy, 1952 (National Needs):

- Policy **focused on national priorities** like land-use management and environmental protection.
- Emphasised securing resources like timber, pasture, and fuelwood for national development.

➤ The National Forest Policy, 1988 (Ecological Security):

- Prioritised **environmental stability, biodiversity conservation**, and soil and water security.
- Advocated for large-scale afforestation and social forestry programs.

➤ Draft National Forest Policy, 2018 (Contemporary Challenges):

- Proposed **revisions to address modern issues like climate change** and human-wildlife conflict.
- Focuses on mitigating climate change and promoting public-private partnerships for forest restoration.

Forest in India

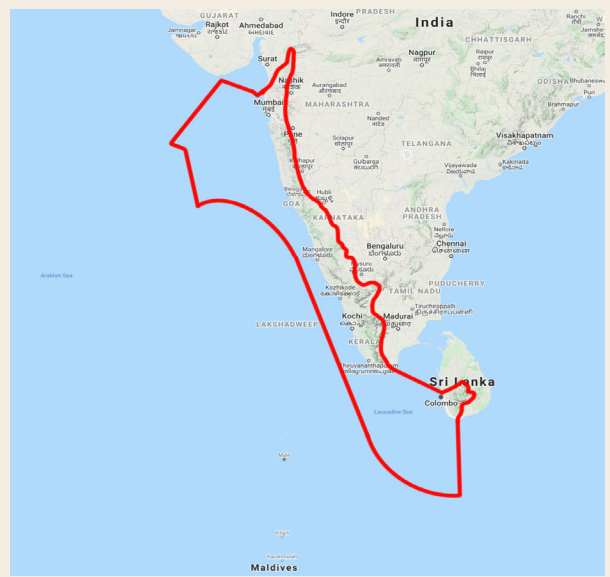
- As per latest **India State of Forest Report (ISFR) 2021**, the **total forest cover** of the country is 7,13,789 square kilometre which is **21.72% of the geographical area** of the country.

Lion-Tailed Macaques

Why in News?

Recently, the adaptation of the **lion-tailed macaque (*Macaca silenus*)** to Valparai’s urban settings underscores the intricate relationship between **wildlife and human activity**, necessitating **conservation measures**.

Note:



What are the Key Characteristics of Lion-Tailed Macaques?

➤ Key Features:

- One of the **smallest macaque species**, it weighs 2–10 kg, has a body length of 42–61 cm, and a 25 cm tail with a **black tuft more pronounced in males**.
- The lion-tailed macaque's black hair, except for its distinctive light-coloured mane around its head and chin, earns it the nickname **"beard ape."**
- Known as **"the wanderoo,"** lion-tailed macaques are **solitary and shy**, staying within their familiar range in hierarchical groups of 10 to 20 members.
- Dominant males of the group emit loud, **human-like 'whoops'** to alert outsiders entering their territory.

➤ Habitat:

- This primate is native to the fragmented **rainforests of Karnataka, Kerala, and Tamil Nadu in India's Western Ghats**, with approximately 2,500 mature individuals remaining.
 - The Valparai plateau, with its vast tea and coffee estates interspersed with forest patches, is part of the **Anamalai Tiger Reserve** and home to one of the 40-odd populations of lion-tailed macaques in the Western Ghats.
- Lion-tailed macaques, living mostly in the **upper canopy of tropical moist evergreen forests**, primarily feed on fruits and seeds but also consume leaves, buds, insects, and small vertebrates, thereby supporting their **ecosystem's health**.

➤ Conservation Status:

- **IUCN Red List: Endangered**
- **CITES: Appendix I**
- **The Wildlife (Protection) Act, 1972: Schedule I**

➤ Threats and Issues:

- The primary danger lies in the **loss of their rainforest home**, with up to 99% of Macaques' original territory vanishing due to extensive deforestation for timber, agriculture, and urbanisation.
- **Behavioural shift** towards human settlements, driven by a scarcity of natural food, habitat degradation, increased human activity, and poor waste management.

➤ Mitigation Measures:

- The **Nature Conservation Foundation (NCF)** has developed **canopy corridors** and implemented regulations to curb feeding and safely guide macaques across roads, aiming to lessen their reliance on human settlements and reduce roadkill incidents.
- The Tamil Nadu government has announced the establishment of a **Tamil Nadu Endangered Species Conservation Fund** with a corpus of Rs. 50 crore, which includes conservation efforts for the lion-tailed macaque.
- The Tamil Nadu Forest Department plans to conduct a study to estimate the macaque population and devise a **comprehensive conservation strategy**.

Note:

Issue of Solid Waste Management

Why in News?

Recently, the **Supreme Court's** critique of **solid waste management** in New Delhi underscores the pressing concern, with over 3,800 tonnes of **untreated waste** in the national capital posing threats to **public health** and the **environment** as it accumulates in landfills.

What are the Issues with India's Solid Waste Management?

➤ About:

- Solid Waste comprises **solid or semi-solid household waste**, sanitary waste, commercial waste, institutional waste, catering and market waste, as well as other non-residential wastes.
 - It also includes street sweepings, silt collected from surface drains, horticulture waste, agriculture and dairy waste, treated biomedical waste (excluding industrial, bio-medical, and e-waste), battery, and **radioactive waste**.
- India accounts for roughly **18% of the world's population** and **12% of global municipal waste generation**.
 - According to a report by The Energy and Resources Institute (TERI), **India generates 62 million tonnes** of waste each year. About **43 million tonnes (70%) are collected**, of which about 12 million tonnes are treated, and 31 million tonnes are dumped in landfill sites.
- With changing consumption patterns and rapid economic growth, it is estimated that urban municipal solid waste generation will **increase to 165 million tonnes in 2030**.

➤ Issues:

- **Poor Implementation of Rules:**
 - **Most metro cities** are littered with garbage bins that are either old, damaged or insufficient in containing solid wastes.
 - One major issue is the **lack of waste segregation** at the source, leading to unprocessed mixed waste entering landfills in contravention of **Solid Waste Management Rules 2016**.

- Additionally, some areas **lack regular waste collection** services, leading to waste buildup and littering.

○ Problem of Dumping Sites:

- Waste processing plants in metro cities face land scarcity, leading to untreated waste and exacerbated by illegal dumping and lack of stakeholder coordination, complicating municipal waste management.
- Despite waste-processing facilities in metro cities, a huge amount of solid waste remains unprocessed, leading to **environmental hazards** such as **methane emissions**, leachates, and landfill fires often turning into tonnes of legacy waste.
- **Biomining efforts** initiated in 2019, are now projected for **completion by 2026**, prolonging the environmental impact until fresh waste is properly managed, perpetuating the growth of landfills.

○ Lack of Data Collection Mechanism:

- Without historical data (**time series**) or data on multiple regions (panel data), private companies cannot effectively assess the potential costs and benefits of participating in waste management projects.
- The lack of data makes it challenging for private entities to **gauge the overall market size** and potential profitability of **waste management** solutions in different regions of India.

○ Formal and Informal Waste Management System:

Municipal waste collection services often fall short in **low-income communities**, creating a gap filled by the informal sector.

- Informal waste pickers often face health risks due to **unhygienic conditions** and lack of safety gear, with **child labour** being a concern in some areas.

○ Lack of Public Awareness:

There is also a general **lack of public awareness** and proper waste management practices, leading to littering and improper disposal habits.

What are the Solid Waste Management Rules 2016?

- These rules replaced the **Municipal Solid Wastes (Management and Handling) Rules, 2000** and

Note:



focused on the segregation of waste at source, the responsibility of the manufacturer to dispose of sanitary and packaging wastes, and user fees for collection, disposal and processing from the bulk generator.

➤ Key Features:

- **Responsibilities of Generators** have been introduced to segregate waste in to three streams:
 - Wet (Biodegradable)
 - Dry (Plastic, Paper, metal, wood, etc.)
 - Domestic hazardous wastes (diapers, napkins, empty containers of cleaning agents, mosquito repellents, etc.) and handover segregated wastes to authorized rag-pickers or waste collectors or local bodies.
- Waste Generators will have to pay:
 - 'User Fee' to waste collectors.
 - 'Spot Fine' for Littering and Non-segregation.
- The **bio-degradable waste** should be processed, treated and disposed of through composting or **bio-methanation** within the premises as far as possible.
- **Manufacturers** and **brand owners** of disposable products like tin, glass, and plastic packaging must **financially assist local authorities** in establishing a **waste management system**.

Other Initiatives Related to Waste Management

- **Plastic Waste Management (PWM) Rules, 2016:** It mandates the generators of plastic waste to take steps to minimise the generation of plastic waste, prevents littering of plastic waste, and ensure segregated storage of waste at source among other measures. In Feb 2022, **Plastic Waste Management (Amendment) Rules, 2022** were notified.
- **Bio-Medical Waste Management Rules, 2016:** The objective of the rules is to properly manage the **per day bio-medical waste** from Healthcare Facilities (HCFs) across the country.
- **Waste to Wealth Portal:** It aims to identify, develop, and deploy technologies to treat waste to generate energy, recycle materials, and extract resources of value.
- **Waste to Energy:** A waste-to-energy or energy-from-waste plant converts municipal and industrial solid waste into electricity and/or heat for industrial processing.

- **Project REPLAN:** It aims to make carry bags by mixing processed and treated plastic waste with cotton fibre rags in a ratio of 20:80.

Sundarbans

Why in News?

Recently, a study conducted by prominent environmental scientists has warned about the substantial threat of **air pollution** to the **Sundarbans**, an essential **mangrove ecosystem** in **West Bengal**.

What is Sundarbans?

➤ About:

- The **Sundarbans** hosts the largest mangrove forests in the world, lying on the **delta of the Ganges, Brahmaputra and Meghna rivers** on the **Bay of Bengal**.
- The mangrove ecosystem is an ecotone between the land and the sea in the tropical and subtropical regions.

➤ Flora and Fauna:

- Due to the ecotonic effect this zone fosters a rich blend of habitats, from freshwater swamps and intertidal mangroves to saline forests and open water.
 - The Sundarbans is a sanctuary for a wide variety of species from different habitats, including rare and globally threatened wildlife such as the **estuarine crocodile**, water monitor lizard, **Gangetic dolphin**, and **olive ridley turtle**.

➤ Protection:

- **40% of Sundarban lies in India** and the rest in Bangladesh.
- It was designated a **UNESCO World Heritage site** in 1987 (India) and 1997 (Bangladesh).
- Sundarban Wetland, India was recognised as the **'Wetland of International Importance'** under the **Ramsar Convention** in January 2019.
- **Project Tiger: Royal Bengal Tigers** in the Sundarbans are top predators that control prey populations, preventing overgrazing and maintaining the delicate balance of the ecosystem.
 - **Protecting tigers** also safeguards a vast habitat for other plant and animal species, contributing to a **healthy forest ecosystem** in the Sundarbans.

Note:

- In 2011, India and Bangladesh signed an MoU on Conservation of the Sundarbans, recognising the need to monitor and conserve the Sundarbans.

What are the Challenges Faced by the Sundarbans?

- **Rising Sea Levels:** A consequence of climate change, rising sea levels threaten to inundate low-lying mangroves. This saltwater intrusion disrupts their delicate balance and makes them more vulnerable to storm surges during cyclones.
- **Increased Intensity of Cyclones:** Climate change is also linked to more frequent and intense storms. These cyclones can batter mangroves, causing physical damage and disrupting sediment patterns crucial for their survival.
- **Cash and Food Crops:** The conversion of mangrove forests for agriculture like cash crops (palm oil) or food production (rice paddies) destroys their habitat.
 - This not only reduces the area available for these ecosystems but also fragments existing ones, impacting biodiversity.
- **Loss of Ecosystem Services:** Mangroves provide crucial services like shoreline protection and nursery grounds for fish. Deforestation disrupts these services, impacting coastal communities and fisheries.
- **Threat to Wildlife:** The loss of mangrove habitats due to climate change is leading to the loss of species in the near-threatened or endangered category.
 - Settlement mangroves used to be safe havens for diverse molluscs and crustaceans, but they are disappearing due to polluted discharges and breeding activities of these species.
- **Effect of Pollutants:** Pollutants, enriched with black carbon or soot particles, from nearby urban areas and the entire Indo-Gangetic Plain region are worsening the air quality of the Sundarbans, impacting its ecosystem.
 - These air pollutants significantly affect the ecology and biogeochemistry of the Sundarbans mangrove ecosystem.

Pine Needle Power Projects

Why in News?

Uttarakhand's innovative pine needle power projects, aimed at mitigating forest fires and generating electricity, have fallen short of expectations. Despite the vast potential, technological and practical challenges have hindered their success.

What are Pine Needle Power Projects?

- **Pine Needle Power Projects:** In 2021, the Uttarakhand State government under bio-energy projects announced a scheme to establish power projects that would use pine needles as fuel to generate electricity.
 - The original plan was to establish multiple units ranging from 10kW to 250 kW across the State in three phases (worth about 150 MW).
 - Though the government expected 58 units to be set up, only six units of 250 kW (totally worth 750 kW) have been established.
- **Agency Involved:** Uttarakhand Renewable Energy Development Agency (UREDA).
- **Potential of Pine Needles as a Resource:** 16.36% of Uttarakhand's forest area is covered by chir pine (*Pinus roxburghii*) forests. An estimated 15 lakh tonnes of pine needles are generated annually in the state.
 - If 40% of this, coupled with agricultural residue, could be utilised, it could significantly aid the state's power requirements and provide employment.
- **Ecological Impact:** Chir pine as an exotic species prevents the regeneration of localised species.
 - Using pine needles as fuel is more efficient and less polluting than using them as firewood or letting them burn away.

Renewable Energy from Pine Needles

- Pine needles in India's sub-Himalayan belt pose a fire hazard, yet they also offer the opportunity to be converted into renewable energy sources like bio-oil, briquettes, or biochar.
 - Bio-oil can be used as fuel for engines or furnace oil, while briquettes can be used in brick kilns or boilers for electricity generation.
- Researchers from India's Central Institute of Agricultural Engineering found that the flammability of pine needles makes them a potentially abundant renewable energy source.
 - They can be compacted into high calorific value briquettes or converted into bio-oil through pyrolysis.
 - The bio-oil has a calorific value of 28.52 megajoules per kilogram and can be used in blended fuels for engines or as furnace oil. This makes it a viable alternative to diesel.

Note:



Why have Pine Needle Projects Been Unsuccessful?

- **Technological Limitations:** According to UREDA, the appropriate technology to **sustainably use pine needles for electricity** generation does not labour yet.
- **Operational Difficulties:** Collecting pine needles is challenging due to the steep forest slopes, vulnerability to animal attacks, and insufficient labour at remunerative rates.
 - Additionally, the moisture content of the pine needles causes lower efficiency and high maintenance for the gasification system.
 - Only a minuscule proportion of available pine needles is currently being collected.

Key Facts about Chir Pine



- **Family Name:** Pinaceae | **Botanical Name:** Pinus roxburghii.
- **Geographic Origin:** India | **Ecozone Origin:** Indomalaya.
- **Natural History:** It is one of the most important conifers in the Himalayan region which moulds the life of various ethnic and other communities of the region.
 - It is named after **William Roxburgh**, a Scottish botanist known as the founding father of Indian botany.
- **Vegetation Type:** The Chir Pine is well-adapted to the **Montane Temperate Forests** of the Himalayas.
 - The dense canopy of **Chir Pine trees limits the growth of other plants underneath**. However, some shrub species like **Rubus ellipticus, Fragaria vesca, Myrica esculenta**, etc can survive in these pine forests.

- **Geographical Extent:** Distributed across the Himalayan mountains, including Bhutan, India (J&K, Punjab, Himachal Pradesh, Uttarakhand), Nepal, Pakistan, Sikkim, Afghanistan, and southern Tibet.
- **Characteristics:**
 - Coniferous tree-producing pine cones with gymnosperm (naked seeds).
 - Dark-brown, thick deeply longitudinal fissured bark.
 - Leaves grouped three per bundle, slender, flexible, flabellate-triangular in cross-section.
- **Growing Conditions:**
 - Hardy, drought and high-temperature resistant.
 - Requires full sun exposure.
 - Young trees need weekly watering; mature trees need monthly watering.
 - Suitable Locations: Better suited for spacious areas due to its massive root system.
- **IUCN Red List Status:** Least Concern

Mining in Aravalli Range

Why in News?

Recently, the **Supreme Court** has stopped the issuance of new mining licenses and renewals for existing ones in the **Aravalli ranges** and hills based on a report by the **Forest Survey of India (FSI)**.

- **Haryana's revenue** from legal mining has **significantly increased** in the past decade (Rs 5.15 crore in 2013-14 to Rs 363.5 crore in 2023-24).

What are the Key Facts About the Aravalli Range?

- **About:**
 - The Aravallis are **one of the oldest fold residual mountains of the world** comprised primarily of **folded rock strata**. This formation resulted from the convergence of tectonic plates during the **Proterozoic Era (2500-541 million years ago)**
 - The Forest Survey of India (FSI) report, **defined the Aravallis** to include the **hills and a uniform 100-meter-wide buffer zone** around the downsides of the hills.
 - They have an **elevation of 300m to 900m**. The mountains are divided into two main ranges – the **Sambhar Sirohi Range** and the **Sambhar Khetri Range** in Rajasthan.

Note:



- **Guru Shikhar Peak on Mount Abu** is the highest peak in the **Aravalli Range** (1,722 m).
 - Major **tribal communities** include the **Bhil, Bhil-Meena, Meena, Garasia,** and others.
 - The **Supreme Court in 2009** ordered a **complete ban on mining** in the Aravalli hills of Faridabad, Gurgaon, and Nuh districts of Haryana.
 - **Significance:**
 - **Rich in Biodiversity:**
 - It provides **habitat to 300 native plant species, 120 bird species** and many exclusive animals like the jackal and mongoose.
 - **Checks Desertification:**
 - The Aravallis act as a **barrier between the fertile plains** in the east and the **Thar desert** in the west.
 - The **excessive mining** in the Aravalli Range is linked to the spread of the Thar Desert.
 - The **presence of loess**, a desert windblown sediment, **found in Mathura and Agra** suggests that the **desert is expanding** due to the weakened ecological barrier created by the degraded Aravalli Hills.
 - **Impacts Climate:**
 - The Aravalli Range plays a significant role in shaping the **climate of northwest India**. During the monsoon season, these **mountains act as a climatic barrier**, guiding **moisture-laden southwesterly winds** towards Shimla and Nainital.
 - This, in turn, helps **nourish the sub-Himalayan rivers** and contributes to the rainfall that replenish the vast north Indian plains.
 - In the **winter months**, it **protects the fertile alluvial river valleys** from the cold westerly winds from Central Asia.
- What are the Key Concerns Related to the Mining in the Aravalli Range?**
- **Habitat Destruction and Biodiversity Loss:**
 - **Mining activities** break and destroy **Aravalli ecosystems**, displacing wildlife like leopards, hyenas, and various bird species.
 - This **disrupts food chains** and **ecological balance**.



Note:

- Mining in **Rajasthan's ecologically sensitive areas** has threatened the habitat of the **Great Indian Bustard**, a critically endangered bird species.

➤ **Water Scarcity and Air Pollution:**

- The Aravallis acts as a natural **water reservoir**. Mining **disrupts natural water flow** and table recharge, leading to **water scarcity downstream**, impacting agriculture and human settlements.
- A 2018 research paper noted a decline in spring recharge due to mining in Haryana.
- Mining activities **generate dust** and **release harmful pollutants** like silica, affecting air quality and causing respiratory problems in nearby communities.

➤ **Land Degradation and Desertification:**

- Mining **removes vegetation cover**, exposing the soil to erosion.
- Wind and rain wash away fertile topsoil, leading to desertification.
- A study by the **Centre for Science and Environment (CSE)** revealed a 37% decline in forest cover in the Aravalli region of Haryana between 2001 and 2016, likely linked to **mining activities**.

Security

Highlights

- Transnational Organised Crime
- Indian Navy Sheds Colonial Legacy
- Naga Insurgency
- Inter-Services Organisations Act

Transnational Organised Crime

Why in News?

Recently, the heads of the **Financial Action Task Force (FATF)**, **Interpol**, and the **United Nations Office on Drugs and Crime (UNODC)** have emphasised the urgent need to intensify efforts to target the **massive illicit profits generated by transnational organized crime (TOC)**.

- Additionally, the recent revelations from the **Indian Cyber Crime Coordination Centre (I4C)**, a division under the **Ministry of Home Affairs (MHA)**, have shed light on the escalating threat of **cybercrime targeting Indian citizens**.

What is Transnational Organised Crime?

- **About:** Organised crime is defined as illegal activities carried out by groups or networks working together, often involving violence, corruption, or **related actions to gain financial or material benefits**.
 - Transnational organised crime (TOC) occurs when activities or groups **operate in multiple countries**.
- Different Forms:
 - **Money Laundering:** It disguises financial assets to use them without detection of the illegal activity that produced them. Criminals transform the proceeds of criminal activity into funds with a seemingly legal source.
 - The estimated amount of **money laundered** globally exceeds **2% to 5% of the global Gross Domestic Product (GDP)** or approximately USD 800 billion to USD 2 trillion in just one year.
 - **Drug Trafficking:** It continues to be the most lucrative form of business for criminals,
 - Global **drug trafficking** is estimated to be worth USD 650 billion, contributing 30% of the overall illicit economy.

- **Human Trafficking:** A global crime where men, women, and children are used for sexual or labour-based exploitation.
 - **Human traffickers** are in it for the money, with estimated annual global profits of USD 150 billion.
 - They victimise an estimated 25 million people worldwide, with 80% in forced labour and 20% in sex trafficking.
- **Smuggling of Migrants:** A well-organised business moving people around the globe through criminal networks, groups, and routes.
 - In 2009, USD 6.6 billion was generated through the illegal **smuggling** of 3 million migrants from Latin America to North America.
- **Illicit Firearms Trafficking:** **Arms trafficking** or gunrunning is the illicit trade of contraband small arms, explosives, and ammunition, which constitutes part of a broad range of illegal activities often associated with transnational criminal organisations.
 - Brings in around USD 170 million to USD 320 million annually.
- **Trafficking in Natural Resources:** It involves the trade of **non-renewable resources** like minerals and fuels, and **renewable resources** like wildlife (skins and body parts for export to foreign markets), forestry, and fishery.
 - This trade is often called an “**environmental crime**” by international organisations.
 - The sale of **elephant ivory, rhino horn** and **tiger** parts in Asia alone was worth an estimated US USD 75 million in 2010.
- **Fraudulent Medicines:** These include **counterfeit medicines** and medicines diverted from legal and regulated supply chains.
 - Instead of curing people, fraudulent medicines can result in **death or cause resistance to drugs** used to treat deadly infectious diseases.

Note:

- **Cybercrime and Identity Theft:** Criminals exploit the Internet to steal private data, access bank accounts, and fraudulently obtain payment card details.

Cybercrimes Targeting Indian Citizens

- **Surge in Cybercrime Incidents:** I4C reports an average of around **7,000 cyber-related complaints daily**, indicating a significant increase in cybercrime incidents.
 - Various types of cybercrimes, including **digital arrest**, trading scams, investment scams, and dating scams, have been identified, highlighting the diverse tactics employed by cybercriminals.
- **Origin in Southeast Asia:** Nearly **45% of cybercrimes targeting Indian citizens originate from Southeast Asian countries**, particularly Cambodia, Myanmar, and Laos.

What is the Impact of Transnational Organized Crime?

- **Global Public Health:** Counterfeit medicines, especially prevalent in low- and middle-income countries, can be ineffective or harmful, leading to an estimated 1 million deaths per year globally.
 - The **World Health Organization (WHO)** estimates that **over 1 million people die each year from falsified or substandard medicines**, with 200,000 of those deaths in Africa.
- **Resilient and Inclusive Global Economy:** Money laundering and illicit financial flows undermine financial integrity and state public financing capacities, obstructing economic development.
 - TOC can drain **foreign exchange reserves** and affect asset prices, undermining economic stability.
 - The global offshore economy conceals an estimated **10% of the world's wealth**, including proceeds from organized crime.
- **Planet Health:** Organized environmental crime drives **deforestation, biodiversity loss, and carbon emissions** contributing to **climate change**.
 - Illicit production and smuggling of **synthetic refrigerants (HFCs)** undermine the **Montreal Protocol** and contribute to climate change.
 - Lack of consensus on defining and criminalizing **environmental crimes** enables criminals to evade enforcement efforts.

- **International Peace and Security:** The illicit arms trade fuels armed conflicts, violent crime, and other organized criminal activities.
 - Non-state armed groups engage in illicit markets to support their activities, including **natural resource extraction and smuggling**.
 - Organized crime-related violence, particularly in Central and South America, often exceeds casualties from armed conflicts.
- **Local Effects:** While transnational organized crime is a global threat, its effects are felt locally.
 - It can destabilize countries and entire regions, undermining development assistance in those areas.
 - Organized crime groups can work with local criminals, leading to an increase in **corruption, extortion, racketeering, and violence**, as well as other sophisticated crimes.
 - It adds to **public spending for security** and policing and undermines human rights standards.

Why is it Crucial to Target Illicit Profits?

- **Sustainable Development Goals:** Disincentivizing criminal activity by targeting illicit profits would positively impact the goals of the **2030 Sustainable Development Agenda**, including **Financial stability, Inclusive economic growth, and Strengthened institutions and governance**.
- **Disrupts Criminal Activities:** By targeting the financial gains from illegal activities, it becomes more difficult for **criminals to fund their operations** and sustain their networks.
 - Illicit profits often fuel other illegal activities. Cutting off these funds helps in **preventing further crimes**.
- **Promotes Rule of Law:** Confiscating illicit profits supports the **rule of law** and demonstrates that crime does not pay.
- **Aids Development Goals:** Redirecting illicit funds towards legitimate purposes can support economic growth and development initiatives.
- **Enhances Global Security:** Money laundering and terrorism financing pose threats to **international peace and security**. Targeting illicit profits helps in combating these threats.
- **Safeguards Vulnerable Populations:** Criminal activities financed by illicit profits often exploit the most vulnerable. By targeting these profits, we can protect these populations.

Note:

- **International Cooperation:** It encourages international cooperation in fighting transnational organized crime and terrorism financing.

What are the Challenges Regarding Controlling TOC?

- **Diverse Legal Systems:** Variations in legal frameworks across countries complicate international efforts to combat TOC.
- **Lack of Consensus:** Achieving global consensus on strategies to address TOC is difficult due to varying national interests and priorities.
 - The **UN Convention Against Transnational Organized Crime (UNTOC)** is the main legal instrument, but its implementation and cooperation regime are ineffective.
 - The UNODC and other bodies lack a coherent strategy, taking a piecemeal approach.
 - Powerful states prefer informal, unilateral solutions, which often lack oversight and pose challenges to the rule of law and human rights.
- **Corruption:** TOC often involves corruption, which infiltrates and undermines law enforcement and governance structures.
- **Technological Advancements:** Criminals exploit technology for illicit activities, staying ahead of law enforcement capabilities.
- **Armed Conflict:** In regions of conflict, TOC can fuel violence and instability, complicating efforts to control it.
 - The connection between TOC and terrorism, where criminal profits fund terrorist activities, poses a significant threat.

Legal Position In India on Organized Crime

- Organized crime has historically existed in India, but it has become more prominent in modern times due to various socio-economic and political factors and advancements in science and technology.
- At the national level, India lacks a specific law to address organized crime, and existing laws like the **National Security Act, of 1980, and the Narcotic Drugs and Psychotropic Substances Act, of 1985** are insufficient as they focus on individuals rather than criminal groups.
 - Some states, such as **Gujarat, Karnataka, and Uttar Pradesh, have implemented their laws to combat organized crime.**

- India is a party to international conventions and treaties aimed at preventing and suppressing organized crime globally. These include the UNTOC, the UNCAC, and the UNODC.

Indian Navy Sheds Colonial Legacy

Why in News?

Recently, the **Indian Navy** has taken significant steps to shed its **British colonial legacies** by renaming **traditional naval symbols** and introducing new insignias.

- This transformation **underscores India's efforts** to redefine its naval identity to reflect its national heritage and aspirations better.

What are the Recent Changes in Nomenclature?

- **New Nomenclature:** To indigenize and reflect national pride, the Indian Navy has renamed **'Jack' to 'National Flag'** and **'Jackstaff' to 'National Flag Staff'**.
- **Old Terms and Their Origins:** The terms **'Jack' and 'Jackstaff'** are deeply rooted in British naval history and have been adopted by navies worldwide, including India, as remnants of British naval practices.
 - **'Jack'** typically refers to a **flag**, and the **'Jackstaff'** is a short pole from which this flag is flown, positioned at the **bow of a ship**.
- **Regulatory Framework and Legal Amendments:** The change in nomenclature was formalised through an amendment to the **"Regulations for the Navy (Ceremonial, Conditions and Service and Miscellaneous Regulation) 1963"**, leveraging the powers granted by the **Naval Act of 1957**.

What are Other Symbolic Changes Across the Armed Forces?

- **Changes in Naval Insignia:** In September 2022, the Indian Navy adopted a **new naval ensign**, discarding the British-inspired George's Cross for a design that includes a blue octagon with twin golden borders, the national emblem, and the motto 'Satyamev Jayate'.
 - This insignia draws inspiration from the **seal of Shivaji Maharaj**, symbolising the Navy's reach in all eight directions (four cardinal and four intercardinal).

Note:

Old Naval Ensign

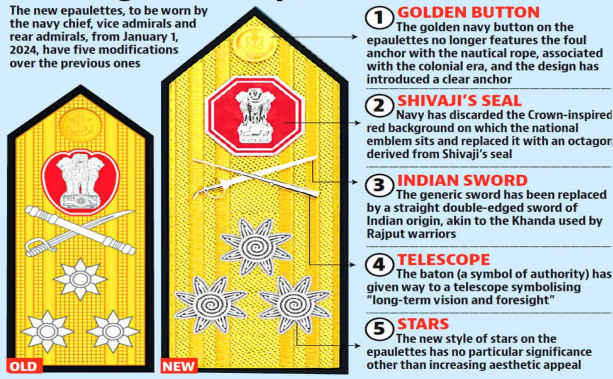


New Naval Ensign

- **Change in Epaulettes of Naval Officers:** The Indian Navy also unveiled **new senior officers' epaulettes** inspired by Chhatrapati Shivaji Maharaj's seal, symbolising a break from colonial legacies and a **celebration of India's maritime heritage**, with five modifications from the previous design for the navy chief, vice admirals, and rear admirals.

Decoding the new epaulette

The new epaulettes, to be worn by the navy chief, vice admirals and rear admirals, from January 1, 2024, have five modifications over the previous ones



- **New Dress Code in Messes:** The Indian Navy has embraced its heritage by introducing the **Kurta-Pyjama in naval messes**, with senior officers among the first to don the traditional attire.
- **Changes in Indian Army:** The **Indian Army** has also started phasing out **traditional practices** such as **horse-drawn buggies at events**, retirement ceremonies, and pipe bands at dinners.

➤ Significance:

- Renaming and redesigning naval symbols indicate both **distance from colonial ties and reasserting Indian sovereignty** and maritime heritage.
- These steps align with India's **Prime Minister's "Panch Pran" pledges** for the nation's development by its 100th year of independence.

National Flag

- The design of the Indian tricolour is largely attributed to **Pingali Venkayya**, an Indian freedom fighter.
- Arguably the **first national flag** of India is said to have been hoisted on **7th August 1906**, in Kolkata at the Parsee Bagan Square (Green Park).
- The National Flag is rectangular with a **length-to-width ratio of 3:2**.
- According to **Article 51A (a)**, it shall be the duty of every citizen of India to abide by the Constitution and respect its ideals and institutions, the National Flag, and the National Anthem.
- A person who is convicted for the following offences under the **Prevention of Insults to National Honour Act of 1971** is disqualified to contest in the elections to the Parliament and state legislature for **6 years**.
 - Offence of insulting the National Flag
 - Offence of insulting the Constitution of India
 - Offence of preventing the singing of the National Anthem

Naga Insurgency

Why in News?

Recently, the **National Investigation Agency (NIA)** filed a charge sheet in a Guwahati court, accusing the **"China-Myanmar module"** of the **National Socialist Council of Nagaland-Isak Muivah (NSCN-IM)** of supporting cadres of **two banned Meitei outfits** to infiltrate India.

- The NIA alleges that the NSCN-IM's actions were **aimed at exploiting ethnic unrest** in Manipur, destabilising the state, and waging war against the Indian government.

What is the Naga Insurgency and Related Issues?

➤ Nagas:

- The **Nagas** are an **indigenous community** residing in the northeastern part of India and the neighbouring areas of Myanmar.

Note:

- It is widely believed that they are **Indo-Mongoloids** who migrated to India around the 10th century BC.

➤ History of Nagas:

- **Nagas under British rule:** The Nagas came under foreign rule for the first time when the British occupied their land in the 19th century.
- **Nagas during World War II:** During **World War II**, the Nagas assisted the British forces.
- The **Naga National Council (NNC)** was founded in 1946 and signed a **Nine-Point Agreement** with the Assam **Governor**, granting Nagas control over their territory.
 - **Naga independence** was declared on 14th August 1947.
- In the 1950s, the **NNC took up arms** and resorted to violence over Naga's sovereignty.
 - The NNC formed the underground **Naga Federal Government (NFG)** and its military wing, the **Naga Federal Army (NFA)**, in 1952.
- Following the **Shillong Accord (1975)** the **NNC split into NSCN**, which further split into **NSCN (IM) and NSCN (Khaplang)** in 1988.

➤ Naga's Issue:

- Naga groups are primarily seeking **Greater Nagalim**, which involves redrawing boundaries to **unite all Naga-inhabited areas in the Northeast** under one administrative jurisdiction, ultimately aiming for sovereign statehood.
 - It includes various parts of Arunachal Pradesh, Manipur, Assam and Myanmar as well.
 - The demand also includes the **separate Naga Yezabo (Constitution)** and **Naga national flag**.

➤ Peace Initiatives:

- **Shillong Accord (1975):** A peace accord signed in Shillong saw the NNC leadership **agree to disarm**, but dissent among leaders led to a split in the organisation.
- **Ceasefire Agreement (1997):** The NSCN-IM signed a ceasefire agreement with the government to **stop attacks on Indian armed forces**. In return, the government would stop all counter-insurgency offensive operations.
- **Framework Agreement with NSCN-IM (2015):** In this agreement, the Government of India **recognised the unique history**, culture and position of the Nagas and their sentiments and aspirations.

What is the Status of Conflicts in Nagaland and Manipur?

➤ History of Conflict in Manipur:

- There are 16 districts in Manipur, but the state is commonly thought of as divided into **'valley' and 'hill' districts**.
 - The **valley region is mostly dominated by the Meitei community**.
- The Manipur valley is surrounded by low hills and is home to **15 Naga tribes** and the **Chin-Kuki-Mizo-Zomi group**, which includes the Kuki, Thadou, Hmar, Paite, Vaiphei, and Zou peoples.
- The **Kangleipak kingdom of Manipur**, a British protectorate, was raided by Naga tribes from the northern hills. The British political agent brought Kuki-Zomi from the Kuki-Chin hills of Burma to protect the valley from plunder by acting as a **buffer between the Meiteis and the Nagas**.
- The Kukis, fierce headhunting warriors like the Nagas, were **given land along the ridges** to act as a **shield for the Imphal valley below**.

➤ Kuki-Meitei Divide: The hill communities (Naga & Kuki) and the Meiteis (valley) have had ethnic tensions since the kingdom era. The **Naga movement** for independence in the 1950s triggered insurgencies among the **Meiteis and Kuki-Zomi**.

- The Kuki-Zomi groups militarised in the 1990s to demand a state within India called **'Kukiland' (a state within India)**. This **alienated them from the Meiteis**, whom they had earlier defended.
 - Whereas the meiteis are seeking to restore their tribal status, as recognized before Manipur's 1949 merger with India.

➤ Reason For Recent Conflict:

- **Issues in Delimitation Process:** In 2020, during the first **delimitation process** in the state since 1973, the Meitei community claimed that the Census figures used were inaccurate, while tribal groups (**Kuki and Nagas**) argued they were **underrepresented** in the Assembly **despite constituting 40% of the population**.
- **Intrusion of Migrants from Neighbour Area:** The February 2021 **coup in Myanmar** has triggered a refugee crisis in India's Northeast, with Meitei leaders claiming a sudden **increase of migrants in villages in Churachandpur district**.

Note:

- **Trigger For Violence:** The initial violent protest arose from the **eviction of a Kuki village**, with 38 villages in the **Churachandpur-Khoupum Protected Forest** area termed as **“illegal settlements,”** allegedly violating **Article 371C**.
- **Convergence of Interest of Militants:** The recent filing of charge sheet signifies the **links between the NSCN-IM based in Nagaland and Imphal valley-based insurgent groups** during the current ethnic crisis.
- One of the arrested individual is a **trained cadre of the People’s Liberation Army (PLA), one of the eight Meitei insurgent groups** that have been banned by the Ministry Of Home Affairs (MHA) for **“advocating secession of Manipur from India through armed struggle.”**
- The **PLA was formed in 1978** and continues to be one of the most violent terror outfits in the northeast and is **currently led by M.M. Ngouba**.

Status of Conflict in Other North-Eastern States

- **Mizoram:** Before gaining statehood in 1987, **Mizoram was a part of Assam** and faced militancy due to the Union government’s inadequate response to its request for aid during the **“Mautam famine,”** with the **Mizo National Front** led by Laldenga demanding independence in 1966.
- **Tripura:** The influx of Hindus from British-ruled East Bengal led to the **reduction of indigenous tribal people** to a minority, sparking a **violent backlash** and the rise of militant groups demanding **restoration of tribal rights**.
- **Assam:** The call for deporting illegal migrants led to the **emergence of militant groups** like the United Liberation Front of Assam (**ULFA**) in 1979, alongside others such as the **Bodo Liberation Tigers** and National Democratic Front of Bodoland (**NDFB**).
- **Meghalaya:** The creation of **Meghalaya from Assam** aimed to meet the distinct requirements of major tribes, including the **Garos, Jaintias, and Khasis**, but also sparked **insurgent movements such as the GNLA and HNLC** due to tribal autonomy aspirations.
- **Arunachal Pradesh:** Throughout history, **Arunachal Pradesh** has generally remained peaceful, but proximity to the Myanmar and Nagaland borders has led to a recent increase in insurgency, with the **Arunachal Dragon Force (ADF)**, later renamed the East India Liberation Front (EALF) in 2001, being the **only indigenous insurgency movement in the region**.

Inter-Services Organisations Act

Why in News?

Recently, the Government has notified the **Inter-Services Organisations (ISOs) (Command, Control, and Discipline) Act** empowering the **Commander-in-Chief or Officer-in-Command of Inter-services Organisations** to manage personnel from all branches of the military, streamlining operations and fostering collaboration.

What are the Key Features of the Inter-Services Organisations (ISOs) Act?

➤ Background:

- Currently, the **Armed Forces** operate under distinct **Service Acts** like the **Army Act of 1950**, the **Navy Act of 1957**, and the **Air Force Act of 1950**.

- However, the **diverse nature** of these acts has sometimes posed **challenges in maintaining** uniform discipline, coordination, and expeditious proceedings across the inter-service establishments.

- The **ISO Act** does not propose any alteration to the existing service acts, rules, or regulations.

➤ Features of the Act:

○ Empowering ISO Leadership:

- The Act grants **Commanders-in-Chief and Officers-in-Command of ISOs** the authority to **exercise disciplinary and administrative control** over service personnel under their command, regardless of their specific branch (Army, Navy, Air Force).

- This **simplifies command structure** and ensures efficient decision-making within ISOs.

○ Constituting and Classifying ISOs:

- Existing ISOs like the **Andaman and Nicobar Command, Defence Space Agency** and the **National Defence Academy** will be formally recognised under the Act.

- The central government may constitute an **Inter-services Organisation** which has personnel belonging to **at least two of the three services:** the army, the navy, and the air force.

Note:

- ISO will be placed under the command of an **Officer-in-Command**.
 - A **Joint Services Command (tri-service)** can also be formed, which will be placed under the command of a **Commander-in-Chief**.
 - **Applicability and Qualifications:**
 - It can be **extended to other centrally controlled forces** beyond the Army, Navy, and Air Force.
 - It outlines the **eligibility criteria** for **Commanders-in-Chief** and **Officers-in-Command**, specifying high-ranking officers from each service.
 - **Control and Commanding Officer:**
 - The **central government retains ultimate authority over ISOs** and can issue directives related to national security, administration, and public interest.
 - It establishes the **Commanding Officer position**, responsible for a specific unit, ship, or establishment within an ISO.
- They will carry out duties assigned by the higher leadership and have the authority to initiate disciplinary or administrative actions concerning personnel under their command.

Note:

- **Joint command** in **Andaman and Nicobar Islands** is the **first Tri-Service theatre command** of the Indian Armed Forces, based at Port Blair in Andaman and Nicobar Islands of India.
 - The Indian armed forces **currently have 17 commands**. There are **7 commands** each of the Army and the Air Force. The **Navy has 3 commands**.

- Each command is **headed by a 4-star rank military officer**.

➤ **Theaterisation of Armed Forces:**

- It is the **integration of the army, air force, and navy** under a single unified command structure for a **specific geographical area**.
- Under it **all the assets and resources** of the three services in that area are placed **under a single commander** responsible for planning and executing all military operations.

What is the Significance of Integration of Armed Forces?➤ **Enhanced Operational Effectiveness:**

- Joint planning and training foster better coordination and understanding between services, crucial for modern warfare.

- **For example: Inter-Services Organisations (ISOs) Act, 2024** empowers the leadership of ISOs to execute a unified command.

➤ **Faster Decision-Making:**

- Streamlined **command structures** within integrated units allow for quicker decision-making on the battlefield.

- Established in 2019, the **Chief of Defence Staff (CDS)** is a **single-point military advisor** to the government, facilitating **better coordination in defence planning and procurement**.

➤ **Optimum Resource Utilisation:**

- Integration **reduces duplication of efforts** and optimises resource allocation across all services.
- The creation of integrated theatre commands aims to **streamline planning, logistics, and operations**.

**Government Initiatives Regarding
Integration of Armed Forces**

- **Inter-Services Organisations (ISOs) Act, 2024**
- **Chief of Defence Staff (CDS)**
- **Idea of Integrated Theatre Commands**



Note:

Art and Culture

Highlights

- Restoration of Virupaksha Temple Pavilion

Restoration of Virupaksha Temple Pavilion

Why in News?

The **Archaeological Survey of India (ASI)** is set to begin restoration work on the collapsed **saalu mantapa or pavilion** (a type of Mandapa) at the iconic **Virupaksha temple** a **Prauda Deva Raya** part of the **Group of Monuments at Hampi**, designated as a **UNESCO World Heritage Site**.

What are the Key Facts About Virupaksha Temple Hampi?

- Virupaksha Temple is the 7th-century Shiva temple in Hampi, Central Karnataka.
- Lord Virupaksha, also referred to as **Pampapathi** is the main deity in Virupaksha Temple.
- The Virupaksha Temple was built in the **Vijayanagara style of architecture** and was built by Lakkan Dandesha, a nayaka under the ruler **Deva Raya II**, also known as **of the Vijayanagara Empire**.

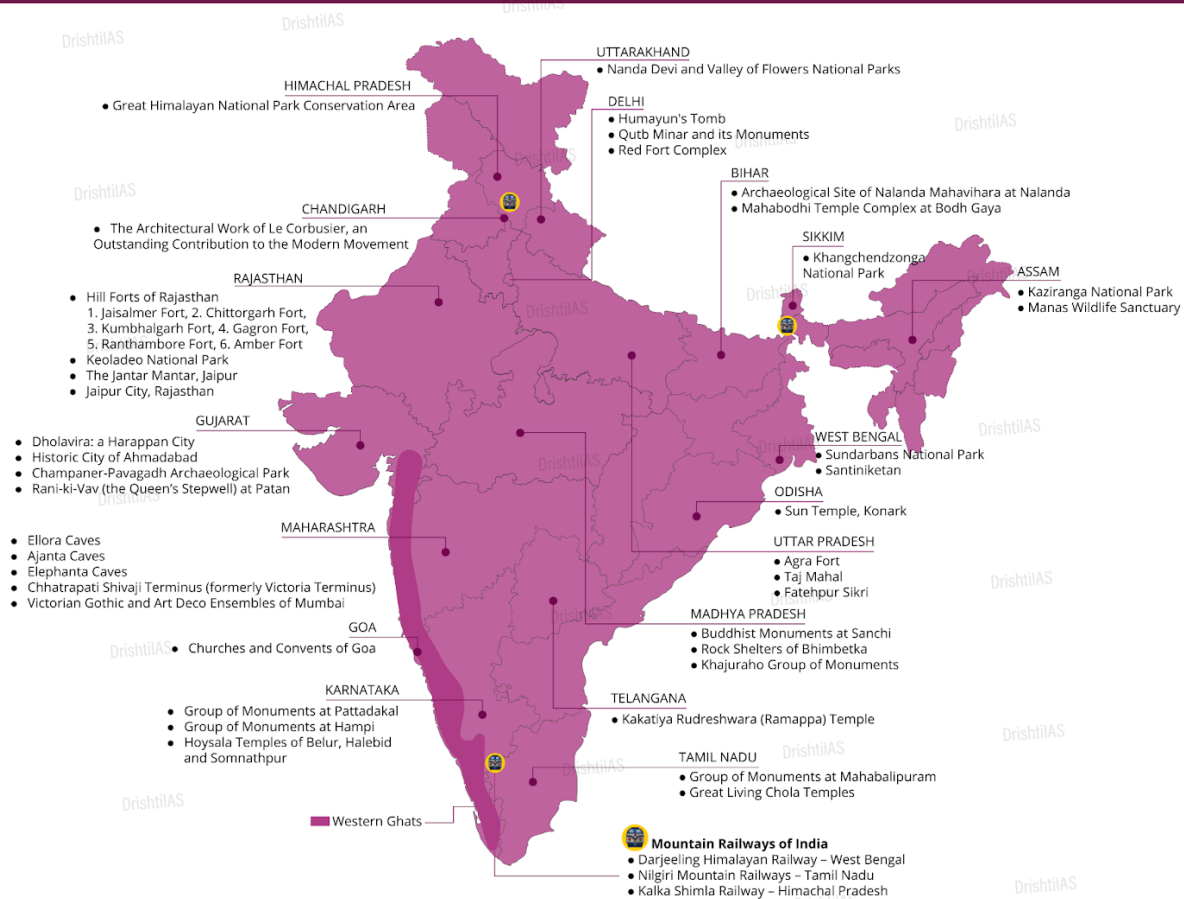


Group of Monuments at Hampi

- Hampi, located in central Karnataka on the banks of the **Tungabhadra River**, is a UNESCO World Heritage Site. Spread over an area of nearly 4,200 hectares, the **site contains over 1,600 surviving monuments, including forts, temples, palaces, and other structures**.
 - It was once the **capital of the Vijayanagara Empire**, known for its historical and archaeological significance.
- The location of Hampi, amid craggy hills and the **Tungabhadra River**, provided a **natural defensive setting for the capital city**.
- Hampi's monuments showcase the pinnacle of **Vijayanagara architecture**, a synthesis of the **Dravidian style** with **Indo-Islamic influences**.
- **Architectural Marvels:** The Vitthala Temple complex, features exquisitely carved pillars and the **iconic Stone Chariot**.
 - The **Royal Enclosure** with its majestic structures like the **Lotus Mahal and Elephant Stables**.
 - The **Hazara Rama Temple**, is known for its intricate stone carvings and sculpted panels.
 - The massive **Virupaksha Temple**, one of the oldest and most sacred sites in Hampi.
- **Notable Structures:** Krishna temple complex, Narasimha, Ganesa, Hemakuta group of temples, **Achyutaraya** temple complex, **Vitthala temple complex**, Pattabhirama temple complex, and **Lotus Mahal complex**.
- The ruins at Hampi were brought to light in 1800 by an engineer and antiquarian named **Colonel Colin Mackenzie**.
- In recognition of its outstanding universal value, the **United Nations Educational, Scientific and Cultural Organization (UNESCO)** inscribed Hampi as a **World Heritage Site in 1986**.

Note:

UNESCO World Heritage Sites



FACTS

- Total Number of World Heritage Sites in India: 42
- Total Cultural Heritage Sites: 34
- Total Natural Sites: 7 (Kaziranga National Park, Manas Wildlife Sanctuary, Western Ghats, Sundarbans National Park, Nanda Devi and Valley of Flowers National Parks, Great Himalayan National Park Conservation Area, Keoladeo National Park)
- Mixed Site: 1 (Khangchendzonga National Park)
- World Heritage Sites Listed First: Taj Mahal, Agra Fort, Ajanta Caves and Ellora Caves (all in 1983)
- Latest Addition (2023): Hoysala Temples (42nd site) and Santiniketan (41st site)
- Countries With the Most UNESCO World Heritage Sites: Italy (58), China (56), Germany (51), France (49), Spain (49)
- India is 6th in number of World Heritage Sites in the World



Drishti IAS

Note:

History

Highlights

- *Wooden Artifacts of Stone Age*

Wooden Artifacts of Stone Age

Why in News?

Recently, research has challenged the traditional view of the **Stone Age**, suggesting it might be more aptly described as the '**Wood Age**'.

- This perspective arises from the discovery and analysis of **wooden artifacts** dating back 300,000 to 400,000 years in Schöningen, Germany.
- Recently, the discovery of prehistoric artifacts at Ghugwa, Madhya Pradesh suggests that ancient hunter-gatherers utilised fossil wood to fashion tools, estimated to be over 10,000 years old, comprising mid-sized flakes and microliths found in the same area.

Note:

- Human presence in India and Germany stretches back millennia, with stone tools dating to 1.5 million years in the Narmada Valley and 800,000 years in the Rhine Valley, respectively.

How Wooden Tools Challenge Ideas of the Stone Age?

- **Sophisticated Wooden Tools:** The artefacts exhibited a diverse range of woodworking techniques beyond simple sharpened sticks.
- **Insights into Early Human Behaviour and Capabilities:** The unearthing of ancient hunting tools challenges the perception of prehistoric humans as mere scavengers, **revealing their strategic hunting, planning skills, and technological adaptability** through tool repair and reuse.
- **Preservation Bias:** Research **highlights a bias in archaeology towards preserving stone over organic materials**, which may distort our understanding of wood's importance in prehistoric times, despite well-preserved wooden artifacts revealing its crucial role.



What is the Stone Age?

- The **Stone Age** began when hominids first picked up **stone tools**, some 3.4 million years ago (mya), in modern-day Ethiopia. **This period**, which went on till about 6,000-4,000 BP (Before Present), **comprises 99% of human history**.
- **Stone Age in India:** India's varied land, water, plants, and animals helped people live all over **except in the Himalayas and the Indo-Gangetic plains during the Stone Age**. The Stone Age is divided into three main periods namely the Paleolithic, the Mesolithic, and the Neolithic. Further, **the Indian Palaeolithic is divided into three developmental stages:**
 - **Lower Palaeolithic (600,000 years BP to 150,000 years BP):** It involved the use of **large pebbles** or flakes for making choppers and chopping tools, hand axes, cleavers, knives etc. The Lower Palaeolithic has **two cultural traditions:**
 - Soanian pebble-tool tradition
 - The Peninsular Indian handaxe-cleaver tradition.
 - **Middle Palaeolithic (165,000 BP to 31,000 years BP):** It is based on the use of a **variety of flakes struck** from cores for preparing scrapers, points, borers and other tools.

Note:

- **Upper Palaeolithic (40,000 years BP to 12,000 years BP):** In this phase, improvements included making various types of tools like **blunted blades, penknife blades**, blades with serrated edges, and arrow points from long parallel-sided blades using a punch technique.
- **Mesolithic Culture:** During this era, people inhabited semi-permanent and temporary settlements, **utilised caves and open areas, practised burial rituals**, demonstrated artistic abilities, maintained cultural continuity, and **utilised microlithic tools for hunting smaller prey**.
- **Neolithic period:** It marked the **beginning of agriculture** and **animal domestication**.
 - Early evidence of Neolithic culture is found in the **Fertile Crescent region of Egypt** and Mesopotamia, the Indus region, the Ganges Valley of India, and also in China.



Note:



drishti

Geography

Highlights

- Solar Storms
- Cyclone Remal
- Influence of Wind Shear on Hurricanes
- Global Impact of Land Squeeze

Solar Storms

Recent studies have found that the **Sun's magnetic field** originates approximately **32,000 kilometres** beneath the sun's surface, which is shallower than previous estimates of over **209,000 kilometres**.

- This discovery could help in predicting **solar cycles** and forecasting occurrences of **severe solar storms** more accurately.

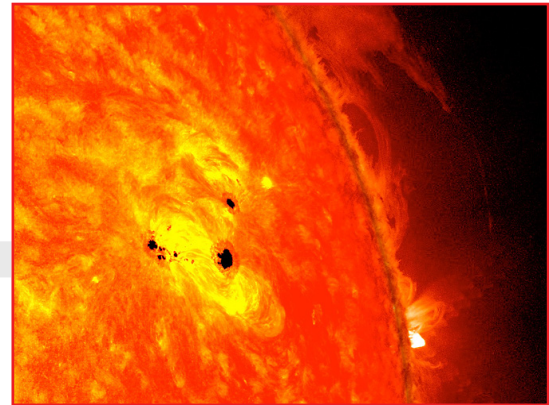
What are Solar Cycle, Sunspots and Solar Flares?

➤ Solar Cycle:

- The solar cycle is the cycle that the **Sun's magnetic field** goes through approximately every 11 years, during which the it's **magnetic activity increases and decreases**.
 - The Sun, a massive ball of hot, **electrically-charged gas**, generates a **powerful magnetic field that** undergoes a cycle known as the **solar cycle**.
- Every **11 years** or so, the **Sun's magnetic field completely flips**. This means that the **Sun's north and south poles switch places**.
- The solar cycle affects activity on the surface of the Sun, such as **sunspots** which are caused by the Sun's magnetic fields.
- The **solar cycle is tracked by counting sunspots**. It starts with a solar minimum, marked by few sunspots, and progresses to a solar maximum, when sunspot numbers peak.

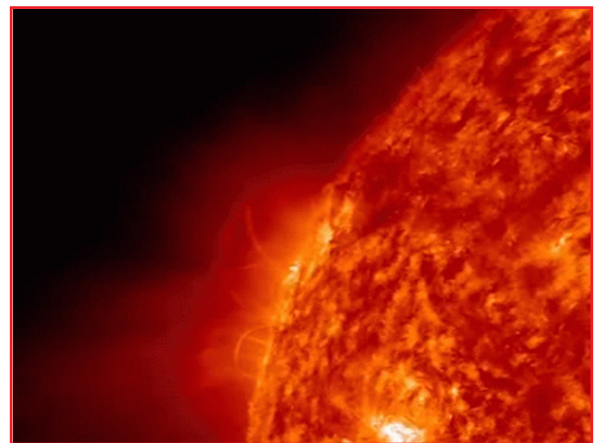
➤ Sunspots:

- Sunspots appear **dark** on the Sun's surface because they are **cooler areas** with **exceptionally strong magnetic fields**, which prevent some heat from reaching the surface.



➤ Solar Flares:

- The magnetic field lines near **sunspots** often **tangle, cross, and reorganise**. This can cause an explosion **of energy** called a **solar flare**.
- Solar flares **emit significant radiation into space**. Intense solar flares can **disrupt radio communications** on Earth.
- Solar flares are sometimes accompanied by a **coronal mass ejection (CME)**. CMEs are **huge bubbles of radiation and particles from the Sun**. They explode into space at very high speed when the Sun's magnetic field lines suddenly reorganise.

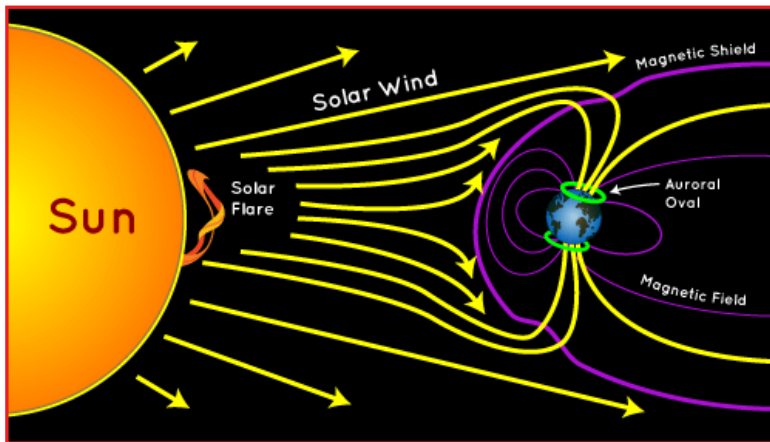


Note:



What are Solar Storms?

- **About:**
 - **Solar storms (geomagnetic storms)** occur when a large-scale magnetic eruption, often causing a **coronal mass ejection (CME)** and associated **solar flare**, accelerates charged particles in the solar atmosphere to very high velocities.
- **Movement Towards Earth:**
 - These move toward the Earth at a speed of about three million miles per hour.
 - When a CME (high-speed solar stream) reaches Earth, it interacts with the **magnetosphere** which causes the magnetosphere to become compressed and agitated, allowing energetic solar wind particles to reach our atmosphere over the poles.
 - The **Earth's magnetosphere** is created by its **magnetic fields** and it usually protects us from the particles emitted by the Sun.
- **Impacts of Solar Radiation Storms near Earth:**
 - When energetic protons **collide with satellites or humans in space**, they can penetrate deep into the object that they collide with and cause **damage to electronic circuits or biological DNA**.
 - During the more extreme Solar Radiation Storms, **passengers and crew in high flying aircraft at high latitudes may be exposed to radiation risk**.
 - Geomagnetic storms can also cause **auroras** (northern and southern lights).



Cyclone Remal

Why in News?

The **India Meteorological Department (IMD)** has issued a warning for a potential severe **cyclonic storm, named Cyclone Remal**, that could impact the coasts of West Bengal and Bangladesh.


What are the Key Insights About Cyclone Remal?

- **Naming:** The name '**Remal**' in the list of **tropical cyclones is given by Oman**. It will be the first cyclone to hit the region this 2024 pre-monsoon season.
 - 'Remal,' meaning 'sand' in Arabic.
- **Origin:** **Bay of Bengal (BoB)**.
- **Factors Contributing to the Formation:**
 - A **depression** (an area of low pressure characterised by circulating winds and atmospheric instability) has formed over the central Bay of Bengal, serving as the genesis for Cyclone Remal.
 - The Bay of Bengal, experiences **water temperatures higher(2–3°C) warmer than average**. This warm water provides the energy needed for cyclones to form and intensify.
 - The **Madden Julian Oscillation**, a band of clouds moving eastward, along with the winds and warm ocean waters, is currently moving south of the Bay of Bengal. These winds play a role in initiating cyclones due to their rotational effect.
- **Potential Impact:** The cyclone may impact the **Sundarbans region** if the landfall happens on the Indian coast and coincides with high tide, potentially causing **partial damage to the fragile ecosystem**.
 - The shallow **bathymetry** and the **funnel-shaped geography** of the northern Bay of Bengal can amplify the intensity of the cyclone as it approaches the coast, increasing the risk of storm surges and flooding.
- **Previous Cyclones:** The cyclone scare comes close to the anniversaries of previous devastating cyclones, such as **Yaas (2021), Amphan (2020), Cyclone Fani(2019), and Aila (2009)** which caused massive damage in the **Sundarbans** and other parts of West Bengal.
 - The state's disaster management authorities and local communities are drawing on the lessons learned from these past experiences to better prepare for and mitigate the potential impact of Cyclone Remal.

Note:

Note:


- The Bay of Bengal (BoB) experiences more cyclones than the Arabian Sea (A.S.) by a **ratio of about 4:1**. However, a 2022 study found that the **frequency of cyclones in the A.S. has increased by 52% from 2001–2019**, while the **Bay of Bengal's frequency has slightly decreased**.
- The BoB is relatively shallower than the A.S. The larger surface area of the BoB allows faster heating causing **higher evaporation**. Inturn forms a **high-pressure zone** in the area causing instability in the region. All these factors make it suitable for cyclone formation.
- The A.S. has traditionally seen fewer cyclones due to **higher salinity, lower sea surface temperatures, and disadvantageous wind systems**.
 - However, changes in ocean and atmosphere warming patterns are leading to **more frequent and severe tropical cyclones in the Arabian Sea**.
 - The positive phase of the **Indian Ocean Dipole (IOD)** and human-induced **climate change** are contributing to the intensification and higher frequency of cyclones in the Arabian Sea.



Drishti IAS

CYCLONE

Cyclones are rapid **inward** air circulation around a **low-pressure** area.

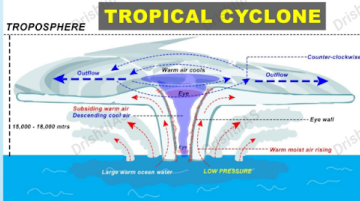


Cyclone v/s Anticyclone

Pressure System	Pressure Condition at the Center	Pattern of Wind Direction	
		Northern Hemisphere	Southern Hemisphere
Cyclone	Low	Anticlockwise	Clockwise
Anticyclone	High	Clockwise	Anticlockwise

Classification

- **Tropical Cyclones;** originate between the **Tropics of Capricorn and Cancer**
- **Extra Tropical/ Temperate Cyclones;** originate in the **Polar Regions**



TROPICAL CYCLONE

Conditions for Formation

- Large sea surface with temperature $>27^{\circ}$ C.
- Presence of the **Coriolis force**
- Small **variations in the vertical wind speed**
- **A pre-existing weak low- pressure area**
- **Upper divergence** above the sea level system

Different Names for Tropical Cyclones

- **Typhoons** - Southeast Asia and China
- **Hurricanes** - North Atlantic and eastern Pacific
- **Tornados** - West Africa and southern USA
- **Willy-willies** - Northwest Australia
- **Tropical Cyclones** - Southwest Pacific and Indian Ocean

Nomenclature

- Nodal Authority - **World Meteorological Organization (WMO)**
- Indian Ocean Region - **Bangladesh, India, Maldives, Myanmar, Oman, Pakistan, Sri Lanka and Thailand** contribute to naming cyclones that occur in this region.

Cyclones in India

- **Bi-annual Cyclone Season** - March to May and October to December
- Recent Cyclones - **Tauktae, Vayu, Nisarga and Mekanu** (in Arabian Sea) and **Asani, Amphan, Fani, Nivar, Bulbul, Titli, Yaas and Sitrang** (in Bay of Bengal)

Note:

Influence of Wind Shear on Hurricanes

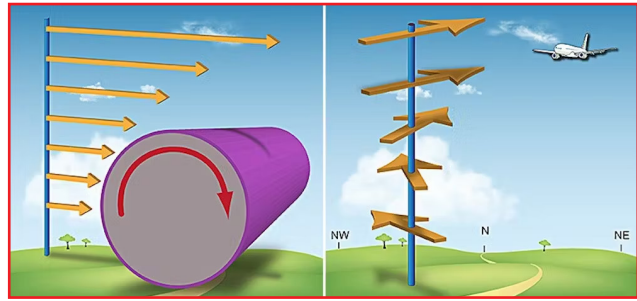
Why in News?

Recently, the concept of **wind shear** has gained increased attention due to its crucial role in determining whether a storm intensifies into a destructive **hurricane**.

What is Wind Shear?

- **About:** Wind shear is a meteorological phenomenon that refers to a **sudden change in wind speed and/or wind direction** over a relatively small distance.
- **Types:** It is mainly of 2 types:
 - **Vertical Wind Shear:** Occurs when wind speed and/or direction changes rapidly with **increasing altitude**.
 - Common examples include **low-level jet streams** and wind shear associated with **thunderstorms**.
 - **Horizontal Wind Shear:** Occurs when wind speed and/or direction changes rapidly over a **horizontal distance**.
 - In this case, the wind might be blowing from the west at one spot, but then suddenly switch to blowing from the north just a bit further on.
 - Common examples include **frontal systems** and **sea breezes**.
- **Major Causes:**
 - **Temperature Inversion:** During calm nights, warm air near the ground traps cooler air above, creating strong vertical wind shear, which could be a hazard for **aircraft taking off and landing**.
 - **Thunderstorms:** Powerful **updrafts and downdrafts** within thunderstorms cause both horizontal and vertical wind shear, making flying near them dangerous.
 - **Frontal Systems:** Boundaries between **warm and cold air masses (fronts)** create rapid changes in wind speed and direction, resulting in horizontal wind shear that can challenge aircraft navigation.
- **Detection Methods:**
 - **Low-Level Wind Shear Alert System (LLWAS):** This network of ground-based towers uses anemometers (wind speed sensors) and wind direction sensors to measure wind speed and direction at multiple points around an airport.

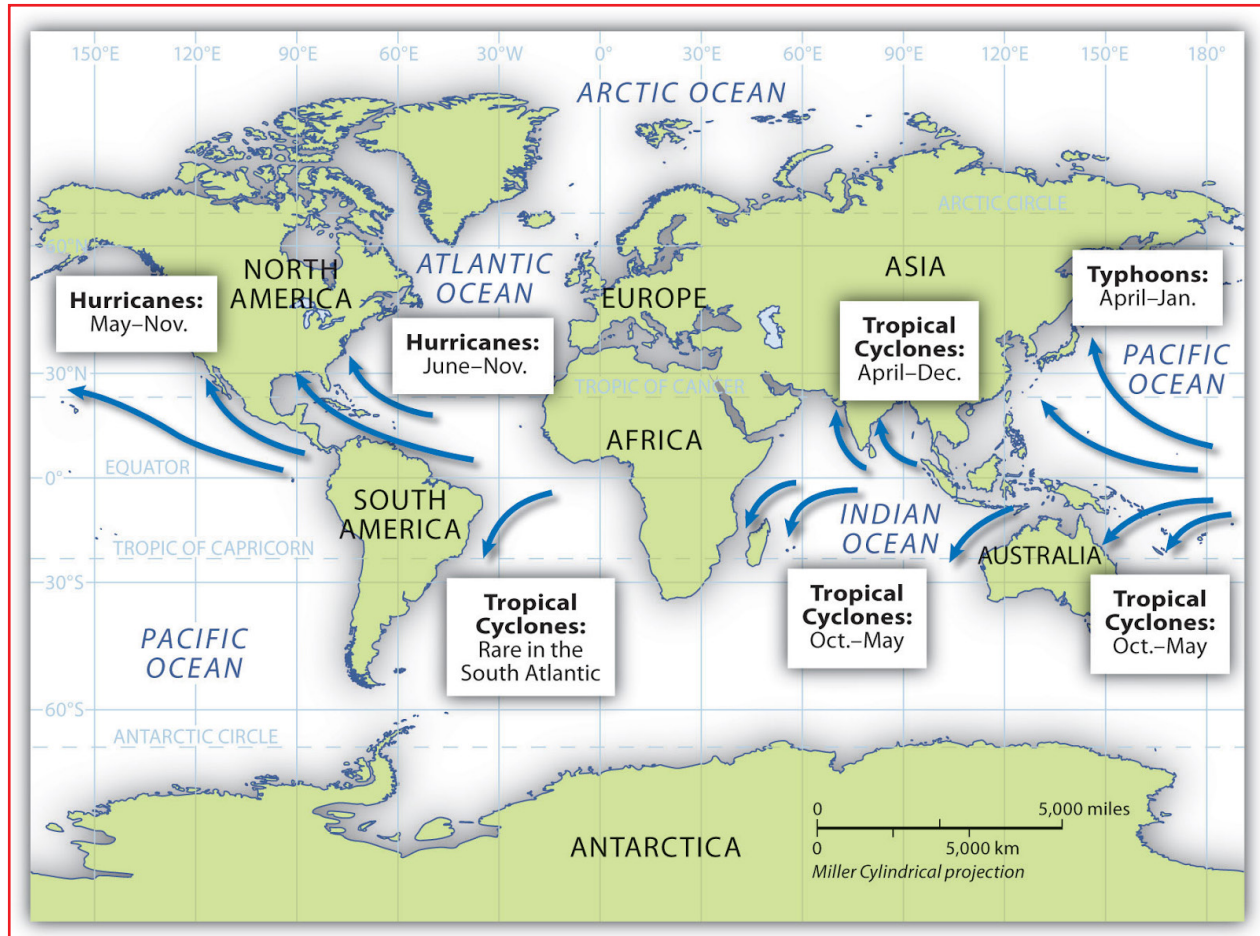
- **Doppler Radar:** On the ground, these radars track wind speed and direction to spot wind shear zones.
- **LIDAR:** This uses light to detect wind shear, especially helpful for clear air turbulence.



What are the Effects of Wind Shear on Hurricanes?

- **About Hurricanes:** Hurricanes or **Tropical Cyclones** are **violent storms** that originate over oceans in tropical areas and move over to the coastal areas bringing about large scale destruction caused by violent winds, very heavy rainfall and storm surges.
 - Its formation and initial development depends upon the transfer of water vapor and heat from the warm ocean to the overlying air, primarily by evaporation from the sea surface.
 - They are given many names in different regions of the world such as:
 - **Typhoons** in the China Sea and Pacific Ocean
 - **Tornados** in the Guinea lands of West Africa and Southern USA
 - **Willy-willies** in north-western Australia and
 - **Tropical Cyclones** in the Indian Ocean
 - **Hurricanes** in the West Indian islands in the Caribbean Sea and Atlantic Ocean.
- **Effects of Wind Shear on Hurricanes:**
 - Hurricanes thrive in environments with minimal vertical wind shear, as it allows for a **symmetrical structure** and **efficient rotation**.
 - **Strong vertical wind shear** can disrupt the hurricane's vertical structure, **offsetting the top of the storm** from the bottom.
 - This **weakens the wind circulation**, heat transport, and moisture supply, which are essential for fueling the hurricane.
 - Excessive vertical wind shear can potentially tear a hurricane apart.

Note:



➤ **Other Factors Affecting Hurricane Intensity:**

- While vertical wind shear is a significant factor, it is not the only determinant of hurricane intensity.
 - Other factors, such as **sea surface temperatures**, **atmospheric moisture content**, and **pressure systems**, also play crucial roles in hurricane development and strengthening.
- In some cases, exceptionally warm sea surface temperatures can overcome the effects of increased wind shear, as witnessed during the **2023 hurricane season**.

What is the Influence of EL Nino and La Nina on Wind Shear?

- **El Nino's Influence on Wind Shear:** During **El Nino** years, stronger-than-usual vertical wind shear is typically observed over the Atlantic Ocean during hurricane season.
 - El Nino events are characterised by warmer sea surface temperatures in the eastern Pacific Ocean and cooler temperatures in the western Pacific.
 - This pattern leads to stronger upper-level winds over the Atlantic, resulting in increased vertical wind shear.
 - The increased wind shear during El Nino years can make it more challenging for hurricanes to develop and intensify in the Atlantic basin.
- **La Nina's Influence on Wind Shear:** **La Nina** conditions, which are the opposite of El Nino, tend to be more favorable for hurricane development in the Atlantic.
 - During La Nina years, vertical wind shear is generally weaker over the Atlantic, allowing for more active hurricane seasons.
 - The record-breaking **2020 Atlantic hurricane season** occurred during a La Nina event.

Note:

El Niño and La Niña

El Niño

- Warming of the ocean surface/ Above average sea surface temp. (SST)
- Easterly winds either weaken or start blowing in the opposite direction
- First noticed by Peruvian fishermen in the 1600s
- More frequent than La Niña

Impacts

- Drastically higher rainfall in S. America (coastal flooding and erosion)
- Droughts in Indonesia and Australia; wildfires
- Weaker monsoons and even droughts in India and SE Asia
- Reduces the upwelling of cooler, nutrient-rich waters from the deep - along the west coast of South and Central America.

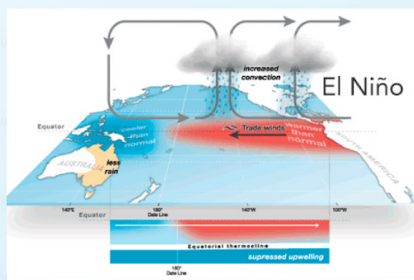


Fig. 1 - Depiction of El Niño Phenomenon

La Niña

- Also called El Viejo, anti-El Niño, or simply "a cold event"
- Normal easterly winds along the equator become even stronger
- May last 1-3 years, unlike El Niño (which usually lasts no more than a year)

Impacts

- Heavier rains in SE Africa, catastrophic floods in Australia
- Drier-than-normal conditions in S. America
- Summer Monsoon rainfall - greater than normal rainfall in India; beneficial for agriculture dependent Indian economy
- Off the west coast of the Americas, upwelling increases, bringing cold, nutrient-rich water to the surface.

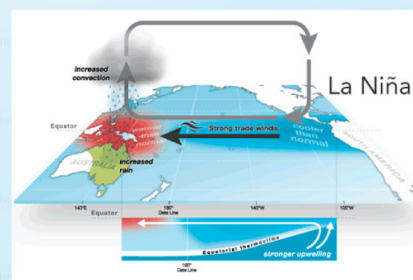


Fig. 2 - Depiction of La Niña Phenomenon

Oceanic Niño Index (ONI)

- It is a measure of the departure from normal sea surface temperature in the east-central Pacific Ocean.
- It is the standard means by which each El Niño episode is determined, gauged, and forecast.



Global Impact of Land Squeeze

Why in News?

A recent study conducted by the [International Panel of Experts on Sustainable Food Systems \(IPES-Food\)](#) focusses on the unprecedented 'land squeeze', threatening farmers and food production.

- Land squeeze refers to the situation where the **demand for land for various purposes** (agriculture, urbanisation, infrastructure, etc.) outpaces the available cultivable land.

What are the Key Highlights of the Report?

- The report **warns of prevalent "land squeeze"** due to rising land prices, land grabs, and carbon schemes, threatening farmers and food production.
- Globally, the **top 1% of the world's largest farms** now **control 70% of the world's farmland**.
 - As land becomes scarce, it can be **converted from productive agricultural land** to other uses, impacting food production

Note:

- Between **2008-2022**, there has been a **doubling of global land prices**.
 - This increase has been particularly pronounced in Central-Eastern Europe, where prices have tripled.
- **“Green grabs,”** land acquisitions are evidently motivated by **environmental concerns**, now account for approximately **20% of large-scale land deals**.
 - **Green grabbing** refers to the large-scale acquisition or control of land and resources for environmental purposes, often with negative social and economic consequences. It’s essentially land grabs done under the guise of environmental protection.
- Over half of the land designated by governments for **carbon removal projects** presents a potential risk of interference with the livelihoods of small-scale farmers and Indigenous people.
 - **Carbon offset markets** are expected to **quadruple in the next 7 years**

What are the Key Reasons Behind Land Squeeze?

- **Land Grabs:**
 - **Large-scale acquisitions** of land by governments, corporations, and speculators are displacing farmers and Indigenous communities.
 - These acquisitions are mainly for **resource extraction** (mining, logging) or **export-oriented agriculture**.
 - **Rising Population and Demands:**
 - The **increasing global population** along with the **huge demand for food, feed, fiber and fuel** is putting lots of pressure on the availability of the land.
 - **Shifts in Global Food Production Systems:**
 - It involves the transfer of large areas of land towards **industrial agriculture** like **Concentrated Animal Feeding Operations (CAFO)** and **monoculture farming practices**.
 - **Industrial agriculture** is the **large-scale, intensive production of crops and animals**, often involving chemical fertilizers on crops and harmful use of antibiotics in animals.
 - Also, there has been **increased demand for land for biofuels** and other **non-food uses**.
- What are the Key Impacts of Land Squeeze?
- **Loss of Access and Control for Farmers and Rural Communities:**

- **Displacement and Dispossession:** Land grabs and other pressures force small-scale farmers and indigenous communities off their land, disrupting their livelihoods and traditional ways of life.
 - **Threatens Food Security:** With **fewer farmers and less land available** for food production, overall food security becomes threatened, particularly for local communities.
 - **Weakened Bargaining Power:** Loss of **land ownership** puts farmers at a **disadvantage in negotiating fair prices** for their products from powerful agribusinesses.
 - **Exacerbated Rural Poverty:** Limited access to land restricts opportunities for **rural populations**, trapping them in a cycle of poverty.
- **Environmental Degradation:**
 - **Unsustainable Practices:** The focus on **large-scale, export-oriented agriculture** often leads to unsustainable land use practices, such as **deforestation, soil depletion, and overuse of water resources**.
 - **Loss of Biodiversity:** Land conversion for mining, infrastructure, and industrial agriculture **destroys natural habitats** and threatens biodiversity.
 - **Increased Vulnerability to Climate Change:** Degradation of soil health and loss of natural vegetation **weaken ecosystems**, making them **more vulnerable to climate shocks**.
 - **Social Unrest and Conflict:**
 - **Competition for Resources:** Competition for scarce land resources can lead to **social tensions and conflicts** between communities and investors.
 - According to the report by **IPES-Food**, **over half of the land** designated by governments for **carbon removal projects** presents a potential risk of interference with the livelihoods of small-scale farmers and indigenous people.
 - **Instability and Outmigration:**
 - Loss of land and livelihood opportunities triggers **rural-urban migration**, putting pressure on urban resources and social services.

Note:

What is the Status of Land Use in India?

LAND USE IN INDIA

Land Use

The way land is utilised for various purposes (residential, commercial and agricultural).

Data on land use is categorised in a nine-fold classification on an yearly basis.

Land-Use Records

- ↳ **Maintained by:**
 - ↳ Land Revenue Department
- ↳ **Measured by:**
 - ↳ Survey of India
- ↳ **Collection:**
 - ↳ **Total geographical area** - 329 million hectares (reporting area)
 - ↳ **Statistics available for** - 305 million hectares (non-reporting area)

7% of the total area is not covered or classifiable under the nine-fold classification

Nine-Fold Classification

- ↳ **Forests:** All lands, whether state-owned or private, wooded or potential forest land, as per forest-related laws (23.44%)
- ↳ **Non-agricultural Uses:** Land occupied by buildings, roads, railways, or underwater (9.03%)
- ↳ **Barren and Unculturable Land:** Includes mountains, deserts, etc. (5.43%)
- ↳ **Permanent Pastures and Grazing Lands:** All grazing lands, whether pastures or not (3.36%)
- ↳ **Culturable Waste Land:** Land available for cultivation but not used for +5 years (3.87%)
- ↳ **Fallow Lands (excluding Current):** Temporarily unused for 1-5 years (3.52%)
- ↳ **Current Fallows:** Cropped areas kept fallow in the current year (4.23%)
- ↳ **Misc. (Trees, Crops, etc.):** Cultivable land not in 'Net Area Sown' but used agriculturally (0.98%)
- ↳ **Net Area Sown:** Total area with crops and orchards (46.10%)

Key Terms

- ↳ **Geographical Area:** Data from the Surveyor General of India on state/union territory size
- ↳ **Reporting Area:** Area with land use data available
- ↳ **Gross Cropped Area:** Total area sown once or more in a year
- ↳ **Area Sown more than once:** Land with multiple crop plantings in a year
- ↳ **Irrigated Area:** Land irrigated by canals, tanks, wells, etc
- ↳ **Total/Gross Irrigated Area:** All land is irrigated one or more times
- ↳ **Total/Gross Un-Irrigated Area:** Area without irrigation
- ↳ **Cropping Intensity:** Total Cropped Area divided by Net Area Sown
- ↳ **Agricultural Land:** Includes net area sown, fallows, wasteland, and more
- ↳ **Total Un-Cultivable Area:** Area minus cultivable land
- ↳ **Total Cultivated Area:** Net area is sown and current fallows
- ↳ **Total Un-Cultivated Area:** Area minus cultivated land

Source: Department of Agriculture and Farmers Welfare, Ministry of Agriculture and Farmers Welfare

Causes for Land Use Change

- ↳ Increasing population and developmental activities
- ↳ Agricultural expansion
- ↳ Climate change
- ↳ Mining
- ↳ Land degradation

Drishti IAS

➤ **India's Initiatives to Tackle the Issue of Land Squeeze and Food Insecurity:**

- **Land Management and Utilisation:**
 - **National Land Records Modernization Programme (NLRMP)**
 - **Formation & Promotion of 10,000 FPOs**
- **Improving Productivity and Reducing Food Waste:**
 - **National Food Security Act (NFSA), 2013**
 - **Mission for Integrated Development of Horticulture (MIDH)**
 - **Pradhan Mantri Gareeb Kalyan Anna Yojana (PMGKAY)**
- **Programs for Land and Soil Conservation:**
 - **Soil Health Card Scheme**
 - **Pradhan Mantri Krishi Sinchayee Yojana (PMKSY).**
 - **National Mission on Sustainable Agriculture (NMSA)**

Note:

What are the Recommendations of the Report?

- **Halt Land Grabs:** Policies and regulations are **needed to prevent land grabs** and ensure land use decisions prioritise local communities and food security.
- **Support Small-Scale Farmers:** Investments in rural infrastructure, secure land tenure, and access to financing are crucial for **empowering** small-scale producers.
- **Sustainable Land Management:** Promote practices that protect soil health, conserve biodiversity, and **ensure long-term food production**.
- **Fair Trade Policies:** Trade agreements should be reformed to promote sustainable agriculture and protect the livelihoods of small-scale farmers.



Note:

Disaster Management

Highlights

- Industrial Accidents *Fire Safety in India*

Industrial Accidents

Why in News?

Recently, an explosion in a chemical unit in Thane, Maharashtra, killed 11 people. Such industrial accidents in India and elsewhere in the world constitute a major problem for industrial establishments.

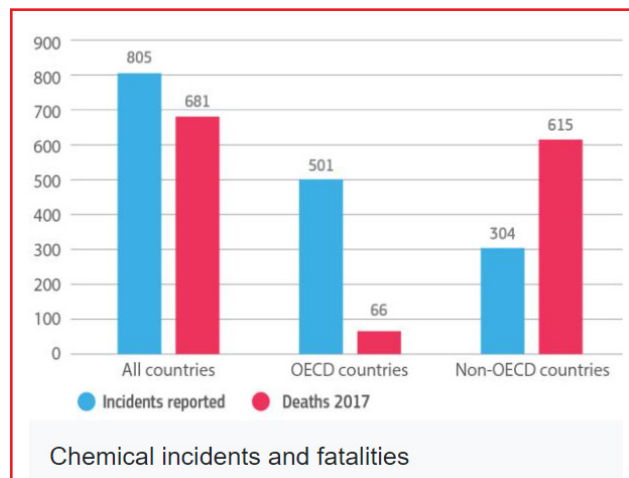
Industrial and Chemical Disaster

- It is defined as the **release or spill of a toxic chemical** that results in an abrupt and serious disruption of the functioning of a society, **causing widespread human, material, or environmental losses** that exceed the ability of the affected society to cope using only its own resources.
- According to the **National Disaster Management Authority (NDMA)**, over 130 significant chemical accidents have been reported in the country in the last decade, claiming more than 250 lives.

What are the Key Factors Contributing to Industrial Accidents in India?

- Inadequate Regulation and Monitoring:** Redundant regulations, including 15 Acts and 19 rules, **lack a unified approach for the chemical industry**. This fragmentation leads to overlapping jurisdictions and loopholes, weakening oversight and enforcement of safety measures.
- Lack of Comprehensive Chemical Risk Database:** The lack of a central database on industrial chemicals and **their risks creates a knowledge gap, hindering hazard assessment** and safety protocol development.
- Insufficient Worker Training and Awareness:** Boiler operation often falls to untrained, contractual workers, lacking proper safety and emergency response training as **highlighted by IIT Kanpur**.

- This leads to confusion during accidents and increases risks, especially with hazardous chemicals.
- Poor Investment in Worker Safety:** Cost-cutting by some industries **often neglects safety equipment and infrastructure**, such as proper ventilation and fire safety.
 - IIT Kanpur study (2023) stresses the **need for increased investment in worker safety to reduce industrial accidents**.
- Lack of maintenance:** The **Visakhapatnam gas leak** involving benzimidazole raises concerns about maintenance and operations.
 - In the **Neyveli incident**, a boiler being revived unexpectedly blew out, despite **not being operational** and mainly involving a furnace and steam production.



Major Industrial Disasters in India in the Past

- India has a long history of industrial accidents, with over 130 significant chemical mishaps reported recently.
- Bhopal Gas Tragedy (1984):** The worst industrial disaster ever, a gas leak from a pesticide plant killed over 3,700 people and injured many more.

Note:

- **Chasnala Mining Disaster (1975):** An explosion in a coal mine caused by methane gas and a subsequent mine collapse led to the deaths of around 700 people.
- **Jaipur Oil Depot Fire (2009):** A fire at an oil storage facility resulted in 12 deaths and the evacuation of over half a million people. The lack of a proper disaster management plan was a major issue.
- **Korba Chimney Collapse (2009):** A chimney under construction collapsed due to poor construction practices, killing 45 workers.
- **Mayapuri Radiological Incident (2010):** Workers unknowingly dismantled a radioactive research irradiator in a scrapyards, exposing themselves and others to radiation.
- **Bombay Docks Explosion (1944):** A cargo ship carrying explosives exploded in Mumbai harbor, killing around 800 people and causing widespread damage.

What are the Consequences of Such Industrial and Chemical Accidents?

- **Loss of Life and Injuries:** Industrial accidents result in numerous fatalities and serious injuries. Example: The explosion at a chemical factory in Thane claimed 11 lives.
- **Environmental Damage:** Chemical leaks, explosions, and improper waste disposal can cause severe environmental damage (air, water, and soil pollution).
 - Example: The **Bhopal Gas Tragedy of 1984** serves as a horrific event, in which leak of **methyl isocyanate gas** from a Union Carbide plant resulted in thousands of deaths and long-term health problems for countless others.
- **Economic Disruptions:** The cost of repairing damage to facilities, compensating victims' families, and treating injured workers can be substantial.
 - A study by the **US Environmental Protection Agency (EPA)** found that chemical accidents can decrease property values in surrounding areas by 5-7%, further impacting the local economy.
- **Psychological Trauma:** The trauma associated with industrial accidents can have long-lasting psychological effects on survivors, witnesses, and families of victims.
 - Anxiety, depression, and **post-traumatic stress disorder (PTSD)** are common consequences.

- **Loss of Public Trust:** Frequent industrial accidents can erode public trust in regulatory bodies and industries. This can lead to public fear and resistance to new industrial projects.

ILO Recommendations on Industrial Disaster Prevention

- **Identification of Hazardous Materials:**
 - Establish a list of hazardous chemicals and flammable gases based on their inherent risks and set specific threshold quantities.
 - Any facility handling hazardous material exceeding the designated amount would be classified as a **"major hazard workplace."**
- **Inventory of Major Hazard Workplaces:**
 - Each state should maintain a comprehensive **inventory of major hazard workplaces** within its jurisdiction with details like the type of facility, chemicals used, and quantities stored.
- **Centralised Data Management:**
 - The **list of hazardous materials and the inventory of major hazard workplaces** should be **stored in a centralised computerised database.**
 - This would allow for **easier access to critical information by regulatory bodies**, emergency responders, and the public.

What are the Legal Safeguards against Chemical/Industrial Disasters?

- **International:**
 - **Sendai Framework for Disaster Risk Reduction 2015-2030**
 - **UN Convention on the Transboundary Effects of Industrial Accident (1992):**
 - It provides a legal framework for **international cooperation** on preventing and responding to industrial accidents.
 - Parties **share information, plan emergencies, and help each other** during disasters. This reduces risk of widespread accidents.
 - **Flexible Framework for Accident Prevention and Preparedness (CAPP) (2006) of UNEP:** It adopts a **flexible approach to help countries**, especially developing ones, build programs to **prevent and prepare for chemical accidents.**
 - It also offers **guidance on creating these programs considering a country's specific needs.**

Note:

- **OECD Programme on Chemical Accidents (1990):** It focuses on **preventing accidents through information sharing and best practices in chemical safety.**
- **India:**
 - **The Bhopal Gas Leak (Processing of Claims) Act, 1985**
 - **The Environment Protection Act, 1986 (EPA)**
 - **The Public Liability Insurance Act, 1991 (PLIA):**
 - This act mandates insurance for industries handling hazardous substances. This insurance provides financial relief to those affected by accidents involving these substances.
 - **The National Environment Appellate Authority Act, 1997:**
 - This act establishes the **National Environment Appellate Authority (NEAA)**, which hears appeals regarding restrictions placed on certain industrial activities under the **Environment Protection Act, 1986 (EPA)**, ensuring a fair and transparent process.
 - **The Hazardous Waste (Management Handling and Transboundary Movement) Rules, 1989:**
 - It requires industries to identify significant accident risks, implement preventive measures, and report any potential hazards to the appropriate authorities.
 - **Additional Measures:**
 - The **National Disaster Management Authority (NDMA)** has issued specific guidelines on Chemical Disaster Management. These guidelines provide direction to various authorities for preparing detailed disaster management plans.
 - Several other laws and regulations, like the **Factories Act, 1948**, and the Insecticides Act, 1968, also play a role in ensuring industrial safety.

The Occupational Safety, Health and Working Conditions Code, 2020

- **Employer and Employee Duties:** Defines responsibilities for both employers and employees regarding safety.
- **Sector-Specific Safety Standards:** Establishes safety standards for different industries.
- **Employee Well-being:** Focuses on worker health, working conditions, working hours, leaves, etc.

- **Contractual Worker Rights:** Recognises and protects the rights of contract workers.
- **Gender Equality:** Promotes gender equality by **allowing women to be employed in all establishments for all types of work.**

Conclusion

The tragic incidents of industrial accidents in India, underscore the **urgent need to address the regulatory and knowledge gaps in the country's industrial landscape.** By taking a holistic and proactive approach, involving **both the government and industry stakeholders**, India can work towards a safer and more sustainable industrial development.

Fire Safety in India

Why in News?

Recently, fire accidents at the Rajkot game-center have raised concerns about fire safety regulations and their enforcement.

- These incidents, including a market fire in Pune and a hospital oxygen blast in Delhi, show a possible need for stronger safety checks and clearer rules.

What is the Model Code for Fire Safety in India?

- **Data on Fire Accidents:**
 - According to the **Accidental Deaths and Suicides in India (ADSI)** report by the **National Crimes Records Bureau (NCRB)**, as many as 7,435 people were killed in over 7,500 fire accidents in 2022.
 - The fire accidents continue to cause heavy casualties, with no lessons learned from past tragedies like the **Uphaar Cinema fire in 1997** and the **Kumbakonam fire in 2004.**
- **National Building Code (NBC):**
 - India has a **National Building Code (NBC)** that serves as the central standard for fire safety.
 - It was published by the **Bureau of Indian Standards (BIS)** in 1970 and last updated in 2016.
 - It provides detailed guidelines on general construction requirements, maintenance, and fire safety of buildings.
 - **Fire safety instructions** are mentioned in **Part 4 of the NBC**, which deals with safety from fire.

Note:

- The NBC is a mandatory requirement for state governments to incorporate into their local building bylaws.
 - This is because **fire services are a state subject**, included as a **municipal function** in the **12th Schedule** of the **Constitution**.
 - **State governments** are responsible for fire prevention and ensuring the safety of life and property.
- The '**Model Building Bye Laws 2016**' issued by the Ministry of Housing and Urban Affairs guide states and Union Territories to **frame their respective building bylaws**.
 - These laws also prescribe norms for **fire protection and safety requirements**.
- The **National Disaster Management Authority (NDMA)** has also laid out guidelines on fire safety at homes, schools, and hospitals.
 - The NDMA guidelines include instructions on **maintaining minimum open safety space**, protected exit mechanisms, dedicated staircases, and crucial evacuation drills.

What are the Key Fire Safety Rules Laid by NBC in India?

- The NBC specifies the **demarcation and restrictions** on the construction of buildings in fire zones:
 - Residential areas, educational, and institutional buildings fall under **Fire Zone 1** to ensure they **do not coexist with industrial and hazardous structures** (like factories, warehouses, data centres, and facilities for power and repair).
- The NBC mandates the use of **non-combustible materials** for construction, including for the internal walls of staircase enclosures, with a minimum **120-minute fire** resistance rating.
- It also outlines requirements for **maximum height, floor area ratio, open spaces**, and provision of openings in walls and floors to prevent the spread of fire.
- **Electrical installations** must have **flame-retardant wiring and cabling**, with high, medium, and low voltage wiring run in separate shafts/conduits and sealed with fire-stop materials.
 - All metallic items like **steel structural members** **must be properly bonded** to the earthing system.

- The Code requires an **emergency power-supplying** distribution system, including exit signage, emergency lighting, **fire alarm systems, and public address systems for emergencies**.
 - It also specifies **requirements for exit access, exits, escape lighting**, and exit signage to ensure safe evacuation.
- The Code recommends incorporating technologies like **automatic fire detection** and down-comer pipelines, **dry riser pipelines, automatic sprinklers, and water sprays**.

NDMA Guidelines on Fire Safety

- **Do's**
 - **Prepare:** Have a fire escape plan and practise it regularly. Ensure all exits are clear and functional.
 - **Alert:** In case of fire, stay calm and raise the alarm. Alert everyone in the building and prioritise escape over belongings.
 - **Escape:** Use the designated escape routes and staircases. Never use elevators during a fire.
 - **Crawl Low:** Stay low to the ground to avoid smoke inhalation.
- **Don'ts**
 - **Panic:** Stay calm and think clearly. Panicking can hinder your ability to make good decisions.
 - **Re-enter:** Never go back into a burning building for any reason.
 - **Use elevators:** Elevators can malfunction during a fire, leaving you trapped.
 - **Open doors/windows without caution:** Opening doors/windows can feed the fire. Only do so if you can escape through them safely.

What are the Compliance Challenges with Fire Safety Rules in India?

- **Ignoring Fire Safety Rules:**
 - While national guidelines (National Building Code) exist, they aren't mandatory, leading to inconsistent enforcement across localities.
 - Even mandatory certifications have loopholes, as the code allows fire services to grant exemptions due to practical difficulties.
 - **Eg:** In **Rajkot Tragic Accident**, the building was constructed using metal sheets, creating a large structure. **The owners failed to get a mandatory NOC from the fire department**, lacked proper fire-fighting equipment on the premises.

Note:

➤ **Underutilisation of Fire Safety Audits:**

- Authorities responsible for fire safety norms are usually understaffed, and they rarely conduct audits, allowing fire hazards to persist.

➤ **Lack of Preparedness and Apathy of Authorities:**

- A 2020 report by the **National Institute of Disaster Management (NIDM)** criticised authorities for their inaction and failure to learn from previous fires accidents.
 - NIDM highlighted that adhering to building codes and implementing effective urban planning could have averted the tragedy and saved lives.
 - NIDM also stressed the significance of **fostering strong communities** to enhance disaster preparedness.



Note:

Ethics

Highlights

- *Ethical and Procedural Lapses in Kerala Surgical Incident*

Ethical and Procedural Lapses in Kerala Surgical Incident

Why in News?

Recently, a Kerala doctor was suspended for **mistakenly performing tongue surgery instead of removing a child's extra finger.**

- This occurred at the Government Medical College Hospital in Kozhikode. Legal action was taken against the doctor under **Indian Penal Code (IPC) Sections 336 and 337** for endangering life.
- This highlights the critical need for strict adherence to medical protocols and ethics.

How do Ethics Guide Medical Practice?

- Ethical principles are foundational in medical practice, often guiding actions more than legal requirements. The **four primary principles include:**
 - **Autonomy:** Respecting the patient's right to make informed decisions about their treatment by obtaining proper informed consent.
 - The consent provided by the child's parents was for a finger surgery, not a tongue surgery, thereby breaching the child's autonomy.
 - **Beneficence:** Acting in the best interests of the patient's health and well-being throughout the surgical process.
 - Performing the wrong surgical procedure does not align with the patient's needs or best interests.
 - **Non-maleficence:** Avoiding harm to the patient. A provisionally or fully registered medical practitioner shall not willfully **commit an act of negligence that may deprive the patient of necessary medical care.**
 - In this incident, the child was subjected to an unnecessary and harmful procedure on her tongue, which is a clear violation of this principle.
 - **Justice:** Treating all patients fairly and equitably, without discrimination based on factors like religion, nationality, race, or social standing.

- This incident raises concerns about whether the child received fair treatment, especially in comparison to standards expected in medical care.

- **Hippocratic Oath:** It is a cornerstone for fresh medical graduates and is recited during convocation ceremonies, binding them to a code of ethics. **Encompassing principles outlined in the Indian Medical Council (Professional Conduct, Etiquette and Ethics) Regulations 2002**, it pledges commitment to humanity's service, adherence to medical laws, respect for life, patient welfare prioritisation, confidentiality, gratitude to teachers, and collegial respect.
 - This oath serves as a moral compass, guiding physicians to uphold the esteemed traditions and ethical standards of the medical profession.

What Ethical Principles are at Stake in Kerala Surgical Incident?

- **Integrity and Objectivity:** The doctor's actions lacked integrity and objectivity, which are foundational values expected in any service, especially healthcare.
- **Dedication to Public Service:** Dedication to patient welfare is fundamental. The surgical mistake indicates a failure in this dedication.
 - Physicians are expected to maintain a high standard of medical practice and care. The surgical error indicates a failure to uphold these duties and responsibilities.
- **Patient Trust and Confidentiality:** Trust is a critical component of the physician-patient relationship.
 - Such incidents can erode trust not only between the patient and the physician but also in the broader healthcare system.
- **Accountability and Ethical Governance:** The doctor's actions raise questions about accountability within the hospital's governance structure.
 - The incident highlights the ethical dilemmas faced in healthcare, emphasizing the need for strict adherence to ethical guidelines.

Note:

Miscellaneous

Highlights

- Sahitya Akademi Fellowship to Ruskin Bond

Sahitya Akademi Fellowship to Ruskin Bond

Why in News?

The eminent Indian author **Ruskin Bond** has been conferred with the **Sahitya Akademi Fellowship**, the highest literary honour bestowed by the **Sahitya Akademi**.



What are Ruskin Bond's Contributions to Literature?

- Born on 19th May 1934, in Kasauli, Himachal Pradesh, Bond has had a prolific writing career spanning over 50 years. He has written in various genres including short stories, novels, non-fiction, romance, and children's books.

- **Notable Works:** *Vagrants in the Valley*, *Once Upon a Monsoon Time*, *Angry River*, *Strangers in the Night*, *All Roads Lead to Ganga*, *Tales of Fosterganj*, *Leopard on the Mountain*, and *Too Much Trouble*.
 - The 1978 Hindi film *Junoon* was based on his historical novel ***A Flight of Pigeons***, which was set during the **Indian Rebellion of 1857**.
- **Honours Received:** **Padma Shri (1999)**, **Padma Bhushan (2019)**, **Sahitya Akademi Bal Sahitya Puraskar (2012)**, and **Sahitya Akademi Award (1992)**.
 - Bond was named a recipient of Akademi's highest honour in 2021.

Sahitya Akademi Fellowship

- Sahitya Akademi confers four types of Fellowships to honour significant contributions to **Indian literature** and to **encourage research on Indian literature and culture by international scholars**.

Fellowship Type	Description
Sahitya Akademi Fellowship	The highest literary honour in India, awarded to "Immortals of Indian Literature." Only 21 Fellows can be elected at any given time.
Sahitya Akademi Honorary Fellowship	For non-Indian scholars who have significantly contributed to Indian literature. Limited to 10 Honorary Fellows at any time.
Premchand Fellowship	For creative writers from South Asian Association for Regional Cooperation (SAARC) countries other than India researching Indian literature and culture. Established in 2005 during Munshi Premchand's 125 th birth anniversary. Provides a stipend, travel, and accommodation for 1-3 months.
Ananda Coomaraswamy Fellowship	For Asian scholars (excluding Indians) pursuing literary projects. Instituted in 1996, revived in 2005. Provides similar support as the Premchand Fellowship.

Note:



drishti

SAHITYA AKADEMI AWARDS

The 2nd highest literary honour by the Govt of India, after the Jnanpith Award Estd. - 1954

CONFERRED BY

- Sahitya Akademi - India's National Academy of letters

AWARDS

- 24 awards for literary works in recognised languages (22 from 8th Schedule + English and Rajasthani)
- 24 awards for literary translations from and into the languages of India.

CRITERIA FOR AWARDS

- Author must be of Indian Nationality
- Book/work must be an outstanding contribution to the corresponding language/literature



SAHITYA AKADEMI AWARDS 2022

BHASHA SAMMAN

- Given for considerable contribution to the propagation, modernization or enrichment of the languages concerned
- Awarded to **Udaya Nath Jha** (valuable contribution in classical and mediaeval literature in the eastern region)

BOOKS SELECTED FOR TRANSLATION

- Yaad Vashem** (N. Nallathambil), **Akupacha Kavithalu** (Varala Anand) +15 more

IMP AWARDEES

- Anuradha Roy
- Badri Narayan
- Mr. Rajendran
- Praveen Bhandekar
- Anis Ashfaq
- Manoj Kumar Goswami

WORK

- All the Lives We Never Lived (Eng novel)
- Tumadi Ke Shabd (Hindi poetry book)
- Kala Pani (Tamil Novel)
- Ujavya Sondechya Bahulya (Marathi Novel)
- Khwab Sarab (Urdu novel)
- Bhool Satya (Assamese)



Anuradha Roy



Badri Narayan

OTHER SAHITYA AKADEMI AWARDS

- Sahitya Akademi Bal Sahitya Puraskar:** Based on author's total contribution to children literature.
 - 2022 Award - **Ganesh Marandi** for **Hapan Mai** (book in Santhali)
- Sahitya Akademi Yuva Puraskar:** Books published by an author of age of 35 and below.
 - 2022 Award - **Pawan Nalat** for **Mi Sandarbha Pokharatoy** (Marathi Poetry)



Read more: [Sahitya Akademi Awards 2023](#)



Note:

Rapid Fire Current Affairs

Highlights

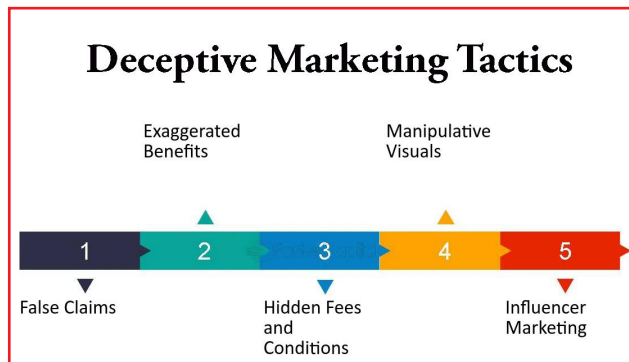
- Deceptive Practices in the FMCG Industry
- ADB's Commitment to India's Development
- Calcutta HC Quashed OBC Quota for Muslims
- Global Unemployment Rate to Marginally Decrease in 2024
- India's Aid to Papua New Guinea
- ESA and Twelve Countries Sign the Zero Debris Charter
- PRAVAAH Portal
- NASA's PREFIRE Mission
- PRAGATI-2024
- Microcephaly
- Spherical Shape of Planets
- Electoreception in Caterpillars
- Gliese 12 b Potentially Habitable Exoplanet near Earth
- Spain becomes 99th Member of ISA
- Launch of RuPay Services in Maldives
- Astronomical Transients
- Extending Tenure of Current Army Chief
- United Nations Department of Safety and Security
- CSIR-CMERI's Innovative Electric Tiller
- ICJ Orders Israel to Cease Military Actions in Rafah
- AI Krish and AI Bhoomi
- Explosive Substances Act and Peroxide Chemicals
- Joint Parliamentary Committee (JPC)
- Brain-eating Amoeba
- Ireland, Norway, and Spain to Recognize Palestine
- IMD Colour-Coded Warnings
- Cancer Drugs Tislelizumab and Zanubrutinib
- National Council for Cement and Building Materials-Incubation Centre
- Electric Vertical Take-off and Landing Aircraft
- R21/Matrix-M Malaria Vaccine
- Buddha Purnima
- Matua Community
- Mystery Behind Venus' Extreme Dryness
- International Booker Prize 2024
- International Day of Biodiversity
- Manipur Thangjing Hills Dispute
- Manipuri Pony
- SC to Revisit 1995 Order of Consumer Court
- Humboldt Glacier
- Kharkiv and Kyiv Region
- Massive Fire at Union Carbide Plant
- Indian Army Gets AK-203 Rifles
- World Telecommunication and Information Society Day
- Stellar Nucleosynthesis
- Centre Granted Citizenship Under CAA
- Football Legend Sunil Chetri
- Bleaching of Sea Anemone
- Nobel Prize Laureate Alice Munro
- 7th Edition of Exercise Shakti
- Soil Nailing and Hydroseeding for Landslide Prevention
- World Lupus Day 2024
- Tileswari Koch-An Unsung Hero of Assam
- Nakuru Dam
- Liquid Nitrogen
- Sperm Whales
- Interim Bail to Delhi Chief Minister
- Quotas for PwDs in All Trains
- Visit of Indian Naval Ships to Malaysia
- Red Colobus
- Project ISHAN
- Tartessos Civilization
- World Migration Report 2024
- NOTTO-ID
- Glycemic Index and Glycemic Load
- World Hydrogen Summit 2024

Deceptive Practices in the FMCG Industry

Fast Moving Consumer Goods (FMCG) are everyday items like snacks and toiletries sold often. FMCG companies employ various deceptive tactics to increase sales and maintain profits, often at the expense of the consumers. These include:

Note:

- **Shrinkflation:** It is the practice of **reducing the size or quantity** of a product without lowering the price, often during periods of inflation, making it less noticeable to consumers.
- **Skimpflation:** It is the practice of **using lower-quality raw materials** or reducing services while keeping the price constant.
- **Deceptive Packaging:** It is the practice of **under-filling containers** while keeping prices the same.
- **Misleading Pricing Strategies:** Artificially **inflate prices** before offering discounts and sell slightly modified versions of popular products as premium items.
- While these tricks are **not illegal**, they **deceive consumers**, and it's essential to ensure that the **Consumer Protection Act, 2019**, and other regulations, which mandate clear labelling of raw materials and weights, are strictly followed.



Read More: [Shrinkflation](#), [Curtailing Misleading Food Ads](#)

ADB's Commitment to India's Development

The **Asian Development Bank (ADB)** has made a significant commitment of USD 2.6 billion in sovereign lending (**important source of financing for countries around the world**) to India in 2023, focusing on various development projects and initiatives.

- ADB's portfolio in 2023 **aligned its portfolio with India's priorities, focusing on structural transformation, job creation, infrastructure, green growth (renewable energy), urbanization, industry, power, and climate resilience, and inclusiveness.**
- Additional funding was approved to bolster **India's national industrial corridor development** program, with specific support for the **Visakhapatnam-Chennai Industrial Corridor**.

- The bank's emphasis on sustainable development aligns with global efforts to achieve the **Sustainable Development Goals (SDGs)** and **eradicate poverty.**
- ADB is a **multilateral development bank established in 1966** with a mission to foster economic growth and **cooperation in the Asia-Pacific Region.**
 - It is **headquartered in Manila, Philippines**, and has **68 members**. It is governed by a board of governors and funded through member contributions, retained earnings from lending, and loan repayments.

Read more: [India, Asian Development Bank Ink Deal for Uttarakhand, Asian Development Bank \(ADB\) Loan to Himachal Pradesh](#)

Calcutta HC Quashed OBC Quota for Muslims

Recently, the Calcutta High Court struck down orders of the West Bengal government providing reservations to multiple communities, including Muslims, under the **OBC category.**

- In 2013, the West Bengal Backward Classes (Other than Scheduled Castes and Scheduled Tribes) (Reservation of Vacancies and Posts) Act, 2012, was notified under which **77 communities (including 75 Muslim communities)** were included in **Schedule I** of the Act.
- The division Bench of Calcutta HC found that **religion had been the "sole" basis** for the West Bengal Backward Classes Commission and the state government to provide reservation, which is **prohibited under the Article 16 of the Constitution and via previous court orders.**
- The Court specifically cited the landmark judgement of **Indra Sawhney vs Union of India (1992)** where the **Supreme Court** established that the **identification and designation of OBC** communities for reservation purposes **cannot be based solely on religious affiliation.**
- Similar Religion-based Reservation in Other States:
 - **Kerala:** Provides an 8% Muslim quota within its 30% OBC quota.
 - **Tamil Nadu and Bihar:** Also Include Muslim caste groups in their OBC quota.
 - **Karnataka:** Had a 4% sub-quota for Muslims within the 32% OBC quota.
 - **Andhra Pradesh:** Provides 5% reservations quota to the backward Muslim Community.

Read more: [Issue of Reservation for Muslims in Andhra Pradesh](#)

Note:

Global Unemployment Rate to Marginally Decrease in 2024

The [International Labour Organisation \(ILO\)](#) has revised its **global unemployment forecast** for 2024, projecting a **slight decrease to 4.9%** from the previously estimated 5.2%, while highlighting the persistent inequalities in labor markets worldwide.

- The revision is mainly due to **lower-than-expected unemployment rates in China, India,** and high-income countries reported so far this year.
- The downward trend in unemployment is expected to flatten in 2025, with the rate remaining at 4.9%.
- Despite the overall improvement, inequalities in labor markets persist, with **women in low-income countries particularly affected.**
- The report highlights that **183 million people are considered unemployed,** while the number of those without a job but wanting to work stands at **402 million.**
- The ILO is the [United Nations](#) agency for promoting social and economic justice through international labour standards.
 - It was created in 1919, as part of the [Treaty of Versailles that ended World War I](#) and became a specialized agency of the United Nations in 1946.
 - **Based in Geneva, Switzerland,** it has **187 member states (India is a founder member)** and

operates as a tripartite organization, bringing together governments, employers, and workers' representatives.

- The ILO is also a member of the **United Nations Development Group**, aiming to achieve the [Sustainable Development Goals](#).

Read more: [India Employment Report 2024: ILO](#)

India's Aid to Papua New Guinea

India has provided immediate assistance of USD 1 million to **Papua New Guinea**, which was struck by devastating **floods** and **landslides**.

- Papua New Guinea is a close friend of India and a partner under the [Forum for India-Pacific Islands Cooperation \(FIPIC\)](#).
 - FIPIC is a platform **launched in 2014** to strengthen India's ties with **14 Pacific Island Countries (PICs)- Cook Islands, Fiji, Kiribati, Marshall Islands, Micronesia, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu** (all located in the Pacific Ocean, to the northeast of Australia).
- Papua New Guinea is an **island nation** located in the southwestern **Pacific Ocean**, comprising the **eastern portion of the island of New Guinea**.
 - The **western half of the island is part of the Indonesian** provinces of Papua and West Papua.



Read More: [Third FIPIC Summit](#), [India's Act East Policy](#)

Note:

ESA and Twelve Countries Sign the Zero Debris Charter

Twelve nations have signed the Zero Debris Charter at the **European Space Agency (ESA) /EU Space Council**, solidifying their commitment to the long-term sustainability of human activities in Earth orbit.

- Unveiled at the **ESA Space Summit** in Seville in November 2023, the Zero Debris Charter aims to **achieve debris-neutrality in space by 2030**.
- The Zero Debris Charter is **facilitated by ESA's 'Protection of Space Assets' Accelerator** and was created by 40 global space actors.
- **Any entity** committed to advancing space safety and sustainability **can sign the Charter** and join the **Zero Debris Community** without needing approval from existing partners.
- Recently, **Austria, Belgium, Cyprus, Estonia, Germany, Lithuania, Poland, Portugal, Romania, Slovakia, Sweden, the United Kingdom**, and the **European Space Agency** have pledged to **adhere to the Zero Debris Charter**, with over 100 organisations expected to join in the coming months.

Read More: [Space Debris](#)

PRAVAAH Portal

Recently, the **Reserve Bank of India (RBI)** has launched 3 major initiatives:

- **PRAVAAH (Platform for Regulatory Application, VALidation and AutHorisation) Portal**: A **secure and centralised online platform** (web-based portal) for individuals and entities to apply for various regulatory approvals from the RBI.
 - This streamlines the process by offering a single point of contact and aims to improve the efficiency of RBI's regulatory approvals.
- **Retail Direct Mobile App**: Provides retail investors with convenient access to the Retail Direct platform for easy investment in **government securities (G-Secs)** directly from their smartphones.
- **FinTech Repository**: A web-based database containing **comprehensive data on Indian FinTech firms**, facilitating better understanding of the FinTech landscape for regulatory purposes.

- Additionally, the RBI launched the **EmTech Repository**, focusing on the adoption of emerging technologies (**Artificial Intelligence, Machine Learning, Cloud Computing**, etc.) by RBI-regulated entities like **banks and NBFCs**.

- Both FinTech and EmTech repositories are secure web applications managed by the **RBIH (Reserve Bank Innovation Hub)**.

Read More: [Reserve Bank of India, RBI Surplus Transfer to Government](#)

NASA's PREFIRE Mission

National Aeronautics and Space Administration (NASA) has recently launched a pair of miniature satellites, called **CubeSats (6U)** to measure the **heat lost from the Earth's poles**.

- The **PREFIRE (Polar Radiant Energy in the Far-InfraRed Experiment)** mission aims to fill a critical gap in understanding the planet's energy budget by studying the **heat emissions from the Earth's poles**.
 - The mission involves **two CubeSats** equipped with thermal infrared spectrometers to measure the amount of **infrared and far-infrared radiation emitted from the Arctic and Antarctica**.
- This data will help scientists better understand the balance between incoming and outgoing heat, which is crucial for **predicting changes in the Earth's ice, seas, and weather patterns**.
- A **cube satellite (cubesat)** is a **standardized, low cost, small satellite** design typically used for technological demonstration and research. It is a **Nanosatellite** - weighs less than 10 kgs.
 - These are relatively inexpensive and can be launched in larger numbers, making them a valuable tool for scientific research and technology demonstrations.

Read more: [Space Missions in 2024](#)

PRAGATI-2024

The **Central Council for Research in Ayurvedic Sciences (CCRAS)** has launched a groundbreaking initiative called "**PRAGATI-2024**" (Pharma Research in AyurGyan And Techno Innovation) to foster collaborative research and innovation in the field of **Ayurveda**.

- PRAGATI-2024 aims to explore research opportunities and foster collaboration between CCRAS and the Ayurveda drug industry.

Note:



- The CCRAS is an **autonomous body** of the **Ministry of AYUSH** (Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homeopathy).
 - It is an apex body in India for the formulation, coordination, development and promotion of research on scientific lines in the **Ayurveda and Sowa-Rigpa systems of medicine**.

AYUSH Systems of Medicine

AYUSH encompasses Ayurveda, Yoga & Naturopathy, Unani, Siddha, Sowa Rigpa, and Homeopathy, with Ayurveda having a documented history of 5000+ years.

Ayurveda

- ⌚ **Samhita Period (1000 BC):**
Emerged as mature medical system
 - ⌚ **Charaka Samhita:** Oldest and most authoritative text
 - ⌚ **Sushruta Samhita:** Gives fundamental principles and therapeutic methods in eight specialties
- ⌚ **Main Schools:**
 - ⌚ **Punarvasu Atreya** - School of physicians
 - ⌚ **Divodasa Dhanvantari** - School of surgeons

Branches of Ayurveda:

- | | |
|---|--|
| ■ Kayachikitsa (internal medicine) | ■ Agada Tantra (toxicology) |
| ■ Shalya Tantra (surgery) | ■ Bhootavidya (psychiatry) |
| ■ Shalaky Tantra (disease of supra-clavicular origin) | ■ Rasayana Tantra (rejuvenation and geriatrics) |
| ■ Kaumarabhritya (paediatrics) | ■ Vajikarana (eugenics & science of aphrodisiac) |



Lord Brahma is believed to be the 1st proponent of Ayurveda

Unani

- ⌚ **Pioneered in Greece, developed by Arabs as 7 principles (Umoor-e-Tabbiya)**
- ⌚ Based on the framework of teachings of **Buqrat** (Hippocrates) and **Jalinoos** (Galen)
 - ⌚ Hippocratic theory of **four humors** viz. blood, phlegm, yellow bile, and black bile
- ⌚ **Recognised by WHO** and granted official status by India as an alternative health system

Siddha

- ⌚ **Dates back to 10000 – 4000 BC; Siddhar Agasthiyar - Father of Siddha Medicine**
- ⌚ Preventive, promotive, curative, rejuvenative, and rehabilitative health care
- ⌚ **4 Components:** Latro-chemistry, Medical practice, Yogic practice & Wisdom
- ⌚ Diagnosis based on 3 humors (**Mukkuttram**) and 8 vital tests (**Ennvagai Theruvu**)

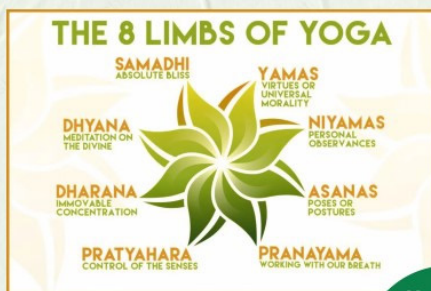
Sowa Rigpa

- ⌚ **Origin: Lord Buddha in India before 2500 years**
- ⌚ Traditional medicine in Himalayan regions of Ladakh, Himachal Pradesh, Arunachal Pradesh, etc.
- ⌚ Recognised in India by Indian Medicine Central Council Act, 1970 (As amended in 2010)

Homeopathy

- ⌚ **German physician Dr. Christian F. S. Hahnemann codified its fundamental principles**
- ⌚ Medicines prepared mainly from natural substances (plant products, minerals, animal sources)
- ⌚ Brought in India by European missionaries - 1810; official recognition - 1948
- ⌚ **3 Key Principles:**
 - ⌚ **Similia Similibus Curentur** (let likes be cured by likes)
 - ⌚ Single Medicine
 - ⌚ Minimum Dose

Yoga & Naturopathy



- ⌚ **Naturopathy:** Healing with help of 5 natural elements - Earth, Water, Air, Fire and Ether
 - ⌚ Based on theories of self-healing capacity of body and principles of healthy living
 - ⌚ Encourages a **person-centred approach** rather than disease-centred

Yoga first propounded by Maharishi Patanjali in systematic form Yogsutra



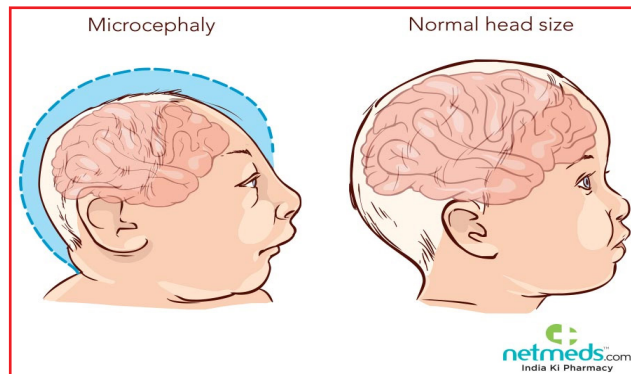
Read more: [SMART Program for Ayurveda](#)

Note:

Microcephaly

Microcephaly, a neurological condition characterised by an **abnormally small head and impaired brain development**, has been the focus of extensive research, with the **SASS6 gene** emerging as a key player in this complex genetic disorder.

- Children with microcephaly often have a **small brain, poor motor function, speech impairment**, abnormal facial features, and **intellectual disability**.
- The roots of microcephaly lie in the peak phase of brain development in the embryo when the **cells destined to become neurons fail to divide normally**.
- Since 2014, a gene called SASS6 and its variants have been implicated in this developmental process.
- Researchers have observed that mutations in the SASS6 gene can lead to **abnormal centriole formation**, crucial for **cell division and neural development**.
- The **Ile62Thr Mutation in the SASS6 gene** has been linked to microcephaly, with the protein made using the mutated gene still being functional enough to allow survival, **but causing brain and head deficits**.
- **According to researchers, consanguineous marriages (cousin marriage)** increase the risk of inheriting a mutated copy of a gene, including the SASS6 gene, leading to a higher incidence of microcephaly.



Read more: [NBRC Researchers Decipher the Cause of Microcephaly](#)

Spherical Shape of Planets

The spherical shape of planets is largely attributed to the interplay of **gravity and geometry**.

- **Gravity** is the primary force shaping planets, compelling them into a spherical form due to their **massive size**.

- A **sphere** offers the **most compact three-dimensional shape, minimising surface area for a given volume**.
- While commonly referred to as spherical, **planets and stars** are actually **oblate spheroids**, slightly flattened at the poles due to **centrifugal force** from rotation.
- **Rotation** creates a centrifugal force, resulting in a slight bulge at the equator, **making gravity weaker** in this region compared to the poles.
- **Gravity tends to shape celestial bodies into spheres**, while smaller bodies such as **comets** and **asteroids** maintain irregular shapes due to stronger **electromagnetic forces**.

Read more: [Comet C/2020 F3 Neowise](#)

Electroreception in Caterpillars

Recent research revealed that **caterpillars** can **detect electric fields** through **setae** on their bodies, an adaptation known as **electroreception**.

- This sensory ability is predominantly found in **aquatic and amphibious species** but has now been observed in these **terrestrial insects**.
- Electroreception enables caterpillars to **sense approaching predators** by detecting **oscillating electric fields** generated by the flapping wings of insects like wasps.
- This sensory ability may have evolved as an **evolutionary response** to intense predation, complementing other sensory defences caterpillars employ.
- Potential interference from "**sensory pollution**," such as **electromagnetic frequencies** from power cables, could disrupt this delicate sensing mechanism, posing a new challenge to their survival.

Read more: [The Secret Lives of Insects](#)

Gliese 12 b Potentially Habitable Exoplanet near Earth

NASA has announced the discovery of an **Earth-sized, potentially habitable exoplanet** named **Gliese 12 b**, located just **40 light-years away from Earth**, making it one of the closest known potentially habitable planets to our solar system.

Note:

- Gliese 12 b has an **average surface temperature of 42 °C**, which is **lower** than the majority of the 5,000 or so exoplanets discovered so far.
 - The exoplanet is **slightly smaller than Earth**, with a size comparable to Venus.
- Gliese 12 b is a super-Earth exoplanet that orbits an **M-type (red dwarf) star, Gliese 12**, every 12.8 days. The star has a **total of seven planets**, all roughly the size of Earth and likely rocky.
 - Three of the planets orbiting Gliese 12 fall within the **habitable zone**, the distance from a star at which liquid water can exist on the surfaces of planets.
 - The host star is **metal-poor**, suggesting it may have **weaker magnetic fields and more volcanism than Earth**, which could help Gliese 12 b maintain an atmosphere.
- **NASA's Transiting Exoplanet Survey Satellite (TESS)** played a crucial role in the initial detection of Gliese 12 b, paving the way for further observations and analysis with the **James Webb Space Telescope**.
Read more: [Exoplanet](#)
- At present, 119 countries are signatories to the **ISA Framework Agreement**, 119th being the Malta, of which 98 countries have submitted the necessary instruments of ratification to become full members of the ISA.
- **India and France** launched the International Solar Alliance (ISA) during the **Conference of the Parties (COP 21)** in Paris to promote solar energy and support the **Paris Climate Agreement's goals**.
- The International Solar Alliance (ISA) is a member-focused initiative **aimed at boosting solar energy technology deployment** to enhance energy access, security, and transition in member nations.
Read more: [International Solar Alliance \(ISA\)](#)

Launch of RuPay Services in Maldives

Maldives will soon launch India's **RuPay** service in its country.



Spain becomes 99th Member of ISA

Spain has become the **99th member** of the **International Solar Alliance (ISA)** following Panama, by handing over the **Instrument of Ratification**.

- RuPay is the first-of-its-kind domestic Card payment network of India, with wide acceptance at ATMs, Point of Sale (POS) devices and **e-commerce** websites across India.
 - RuPay is a product of **National Payment Corporation of India (NPCI)**, the umbrella organization that powers retail payments in the country.
 - NPCI is a "Not for Profit Company" under the **Companies Act**.
 - The **Payment and Settlement Systems Act, 2007**, gave authority to the **Reserve Bank of India (RBI)** and **Indian Banks' Association (IBA)** to establish a safe electronic payment and settlement system in India.

Note:

- **NPCI International Payments Ltd (NIPL)** is the international arm of (NPCI), established in **2018 to export India's digital payment solutions** like RuPay and UPI globally.
- RuPay has launched various card variants catering to the different segments of society.
- RuPay's transactions are already accepted in **Singapore, Bhutan, UAE, Bahrain, and Saudi Arabia.**

Read more: [UPI Services in Sri Lanka and Mauritius, India Maldives Relations](#)

Astronomical Transients

Recently, an Indian-American astronomer **Shrinivas Kulkarni** was awarded the **Shaw Prize for Astronomy in 2024** for his work on the physics of **astronomical transients**.

- **Astronomical transients** are **celestial objects or phenomena that change their brightness over a relatively short period of time**, as compared to longer periods of time over which stars and galaxies change and develop.
- Studying these energetic, short-lived cosmic events could unlock secrets of the universe's most powerful objects and physical laws. Some of the different types of astronomical transients are:
 - **Supernovae:** When the cores of massive stars collapse due to the depletion of fusionable elements, their outer layers explode, releasing immense energy and briefly outshining their entire host galaxy.
 - **Active galactic nucleus (AGN):** Supermassive black holes at the cores of massive galaxies

sometimes actively consume surrounding matter. This interaction causes the matter to emit light with varying brightness.

- **Fast radio bursts (FRBs):** FRBs are powerful bursts of radio waves that can release as much energy in a few thousandths of a second as the sun emits in three days.

Fast Astronomical Transients

- Regularly detected by ground- and space-based observatories
- Initially outburst on timescales of milliseconds to days
- Detection and follow-up observations across electromagnetic spectrum (radio to very high-energy gamma-ray) and multi-messenger
- Requires worldwide coordination and cooperation



Read more: [Astronomical Grand Cycles, String of Pearls Supernova](#)

Extending Tenure of Current Army Chief

The **Appointments Committee of Cabinet (ACC)**, headed by the **Prime Minister**, has granted a rare one-month extension in service to the **current Chief of the Army Staff (COAS)**, General Manoj Pande.

- This is only the second such extension granted in over five decades, the first being to **General GG Bewoor**, who succeeded Field Marshal **SHFJ Manekshaw** as army chief in 1973.
- The ACC approved the extension of current COAS service for one month beyond his normal under **Rule 16 A (4) of the Army Rules 1954** which deals with retaining officers on the grounds of "**exigencies of services**", with the final decision resting with the Central Government.
- The COAS is the **highest-ranking officer in the Indian Army**, appointed by the ACC.
 - The COAS serves as the **head of the army and advises the Defence Ministry** on army-related matters and also serves as the key military advisor to the **President of India**.
- The **COAS retires after three years of appointment or at the age of 62, whichever comes first.**

Read more: [Advancing Defense Integration in India](#)

United Nations Department of Safety and Security

Recently, a former Indian Army officer Colonel, working with the **United Nations Department of Safety and Security (UNDSS)**, was killed in Gaza.

Note:



- The deaths of over 190 UN staff in **Gaza** have led the UN Secretary-General to call for an immediate humanitarian ceasefire.
United Nations Department of Safety and Security (UNDSS):
- It is the security arm of the UN. It provides security expertise to all UN entities so they can safely carry out their missions and programs.
- It identifies and analyses security threats, and then develops strategies to address those risks.
- It has a network of security advisors, analysts, officers and coordinators in over 131 countries to provide security support.

UNSC

United Nations Security Council



Drishti IAS

It is One of the six main organs of the United Nations.
Permanent Headquarters: New York City
Established by: **UN Charter in 1945**



Members: 15 members (5 Permanent and 10 non-permanent)

Permanent Members (P5)


United States


the Russian Federation


France


China


the United Kingdom



According to the Charter, the United Nations has four purposes:

- to maintain international peace and security;
- to develop friendly relations among nations;
- to cooperate in solving international problems and in promoting respect for human rights;
- and to be a centre for harmonizing the actions of nations.

Non-permanent Members


Albania


Japan


Brazil


Malta


Ecuador


Gabon


Ghana


Mozambique


UAE


Switzerland

Read more: [United Nations](#)

CSIR-CMERI's Innovative Electric Tiller

In a move to empower small and marginal farmers, the [Council of Scientific and Industrial Research \(CSIR\)](#) and the [Department of Scientific and Industrial Research \(DSIR\)](#) have unveiled the [CSIR-Central Mechanical Engineering Research Institute's Electric Tiller](#).

Note:

- The electric tiller is designed to cater to the needs of **small to marginal farmers** (land holdings of less than 2 hectares), who **constitute over 80% of India's farming community**.
- The tiller boasts enhanced **torque and field efficiency**, making it a highly capable and efficient agricultural tool.
 - It prioritises user comfort and environmental sustainability, with features like reduced hand-arm vibration, quiet operation, and zero exhaust emissions.
 - The electric tiller can potentially reduce **operational costs by up to 85%**, offering significant financial benefits to farmers.
- The tiller's user-friendly design supports battery pack swapping and multiple charging options, including alternating current (AC) and Solar direct current (DC) charging, ensuring versatility and convenience.
- **CSIR** was established in September 1942, **headquartered in New Delhi** and funded by the **Ministry of Science and Technology**.

Read more: [CSIR PRIMA ET11 and Simplified Tractor Testing Process](#)

ICJ Orders Israel to Cease Military Actions in Rafah

The **International Court of Justice (ICJ)** has mandated Israel to cease its military operations in Rafah immediately.

- The ICJ ruling demands Israel to stop all military actions in the Rafah area and ensure the Rafah crossing remains open for uninterrupted **humanitarian aid**.
- The ICJ also ordered Israel to ensure "unimpeded access" to **UN-mandated investigators** to look into allegations of **genocide**.
- The **International Criminal Court's** prosecutor also sought arrest warrants for top Israeli and Hamas leaders, accusing them of **war crimes** and **crimes against humanity**.
- International Court of Justice (ICJ):
 - The ICJ is the principal judicial organ of the **United Nations (UN)** and is tasked with **resolving legal disputes between states** and providing **advisory opinions** as per international law, but it **lacks effective enforcement** mechanisms for its legally binding rulings.

ISRAEL'S WAR ON GAZA

Differences between the ICJ and the ICC

The International Court of Justice (ICJ) and the International Criminal Court (ICC) are two courts with different functions within the international legal system.

	 ICJ International Court of Justice	 ICC International Criminal Court
Established	1945	2002
UN-relationship	Highest court of the UN	Not part of the UN
Location	The Hague, the Netherlands	The Hague, the Netherlands
Jurisdiction	UN member-states	Individuals
Types of cases	Legal disputes between states and requests for advisory opinions on legal questions	Prosecutes individuals for the most serious crimes as per the Rome Statute
Appeals	No	Yes
Enforcement power	None - relies on the UN Security Council to uphold judgements, with permanent members having veto power	None - relies on cooperation from member states to enforce its decisions

Read more: [Israel-Palestine Conflict](#)

Note:

AI Krish and AI Bhoomi

Recently, **Doordarshan Kisan (DD KISAN)** has become the **first government TV channel** in the country to launch two **AI anchors** named **AI Krish** and **AI Bhoomi**.

- These will act as **information hubs for farmers**, delivering updates on subjects like
 - **Cutting-edge advancements** in agricultural research.
 - **Price fluctuations and trends** in agricultural markets (mandis).
 - **Weather forecasts** that could impact crops.
 - **Details of government schemes** supporting agriculture.
- They can **speak in 50 languages** and **read news 24 hours and 365 days**.
- The initiative aims to **serve the agricultural and rural community**, with a focus on educating and promoting holistic development.
- **DD Kisan** is an Indian **state-owned agriculture television channel**, founded by the **Ministry of Information and Broadcasting**.
- It is the flagship channel of **Doordarshan**, launched on **26th May 2015**.
 - It aims to cater to the farming and rural community, **to strengthen the three-dimensional concept of agriculture**, including balanced farming, animal husbandry, and plantation.

Read more: [Doordarshan Logo](#), [Broadcasting only through Prasar Bharati](#)

Explosive Substances Act and Peroxide Chemicals

A chemical explosion in a Thane (Maharashtra)-based factory, claiming 11 lives, highlights critical safety flaws. Caused by **reactive peroxide chemicals**, the accused have been charged under **Explosive Act 1884**, and **Explosive Substances Act 1908**.

- The Explosives Act of 1884, enacted by the British colonial government in India, regulates the **manufacture, storage, possession, use, sale, import, and export of explosives**. It sets safety standards for handling, transportation, and storage of explosives to prevent accidents.

- The Explosive Substances Act of 1908 encompasses provisions **defining explosive substances** and special category explosive substances, including notable compounds like **RDX**.
 - The Act delineates punishments for causing explosions likely to endanger life or property, along with penalties for attempts to cause explosions or possession of explosives with malicious intent.
- Peroxide chemicals are **organic compounds** that contain a peroxide functional group, which is characterised by **two oxygen atoms linked together**.
 - The general structure for peroxides can be represented as R-O-O-R, where 'R' can be any element. The linkage between the two oxygen atoms (O-O) is known as the **peroxide group or peroxy group**.
 - **Example:** Hydrogen peroxide, Benzoyl peroxide.
 - The bond in **peroxides is weak, making them very reactive** and allowing other chemicals to alter their structure.
 - Peroxides can be **hazardous and can cause fires and explosions** when exposed to heat, shock, or friction.

Read More: [Forever Chemicals](#)

Joint Parliamentary Committee (JPC)

India's main opposition party has called for setting up a **Joint Parliamentary Committee (JPC)** to investigate claims that the Adani Group sold low-grade coal to a state-run company in Tamil Nadu, pretending it was of higher quality.

- The **JPC** is an ad-hoc Committee, established by the **Parliament** to conduct a thorough examination of a **specific subject or Bill**.
 - It consists of members from both Houses as well as from the ruling and opposition parties and is chaired by a member of the Lok Sabha (appointed by Speaker of the Lok Sabha).
 - The **Parliament** determines the composition of the JPC, and there is **no set limit** on the number of members.
 - The committee is **dissolved** after completing its term or task.
 - The committee's recommendations are **advisory** and **not mandatory** for the government to follow.

Note:

- However, suggestions by the Select Committees and JPCs — which have a majority of MPs and heads from the ruling party — are accepted more frequently.
- The JPC has the authority to **gather evidence from experts, public bodies, associations, individuals, or interested parties** either on its own initiative or in response to their requests.
- Some of the cases in which JPC were formed include:
 - Bofors scandal (1987)
 - Harshad Mehta Stock market scam (1992)
 - Ketan Parekh share market scam (2001)
 - [National Register of Citizens \(NRC, 2016\)](#)
 - [Personal Data Protection Bill \(2019\)](#)

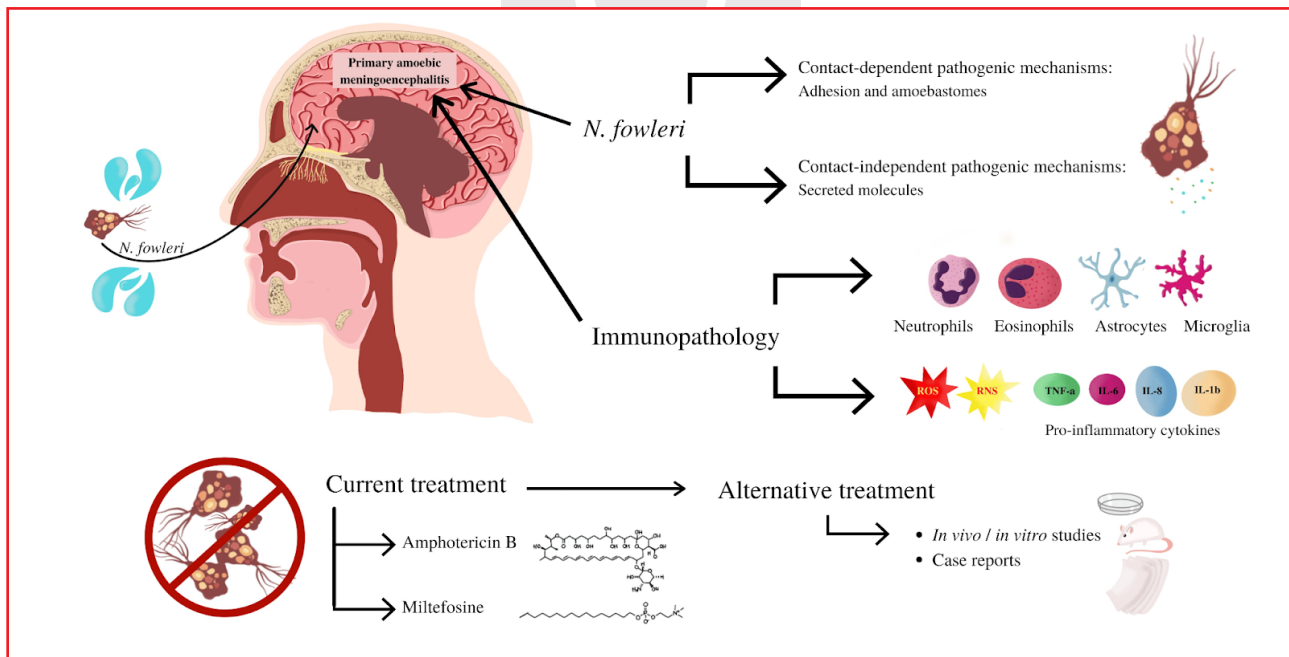
Read More: [Parliament Committees](#), [Select Committee Of Parliament](#)

Brain-eating Amoeba

The recent death of a 5-year-old girl in Kerala due to **primary amoebic meningoencephalitis (PAM)** caused by

the ***Naegleria fowleri* amoeba**, often referred to as the “**brain-eating amoeba**,” has highlighted the **rare yet fatal nature** of this devastating infection.

- *Naegleria fowleri* is a free-living amoeba that thrives in **warm freshwater and soil** around the world.
 - The amoeba enters the body through the nose, typically during activities like swimming, and then travels to the brain, where it destroys brain tissue and causes swelling.
- **Symptoms:** The initial symptoms include **headache, fever, nausea, and vomiting**, followed by a stiff neck, confusion, seizures, hallucinations, and eventually coma.
- **Mortality Rate:** Most people with **PAM die within 1 to 18 days** after the onset of symptoms, and the disease usually leads to coma and death within 5 days.
- **Treatment Challenges:** There is currently **no effective treatment for PAM**, and doctors rely on a combination of drugs, including amphotericin B, azithromycin, fluconazole, and others, to try to manage the infection.



Read More: [Naegleria fowleri: The Brain-Eating Amoeba](#)

Ireland, Norway, and Spain to Recognize Palestine

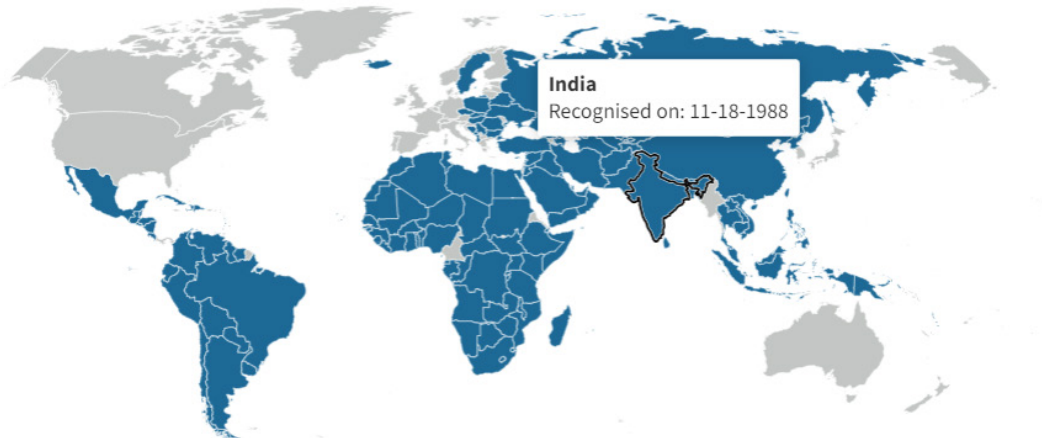
Recently, Ireland, Norway, and Spain have announced that they will **formally recognize the state of Palestine** on 28th May 2024.

Note:

- In response, Israel ordered the immediate return of its ambassadors from Ireland, Norway, and Spain, expressing strong opposition and dissatisfaction.
- Also, recently at the **United Nations General Assembly**, **143 of 193 UN member countries** voted in favour of granting full membership to Palestine.
 - India has always supported the **two-state solution** and was **one of the first non-Arab nations** to recognise Palestine as a state in **1988**.
 - India has also recognised the **Palestine Liberation Organization**.

Countries that recognise Palestine

As of May 22, 2024



Read more: [Israel-Palestine Conflict](#)

IMD Colour-Coded Warnings

Colour-coded alerts have been issued by the **India Meteorological Department (IMD)** for several districts in Kerala due to potential isolated heavy to very heavy rainfall in the state.

- The **IMD** issues **color-coded weather warnings** to alert people about severe or hazardous weather that could cause damage, disruption, or danger to life.
 - It uses **4 color-coded warnings** as: **Green, Yellow, Orange/Amber and Red** depending upon the severity of weather phenomena.
- IMD was established in 1875 as an agency of the **Ministry of Earth Sciences** of the Government of India.
 - It is responsible for meteorological observations, weather forecasting, and seismology.

	NO SEVERE WEATHER EXPECTED Keep up to date with latest forecast
	BE AWARE Remain alert and keep up to date with latest forecast
	BE PREPARED Remain vigilant, keep up to date with latest forecast and take precautions where possible
	TAKE ACTION Remain extra vigilant, keep up to date with latest forecast. Follow orders and any advice given by authorities and be prepared for extraordinary measures

Note:



- It is headquartered in **New Delhi**.
- IMD is also one of the six Regional Specialized Meteorological Centres of the [World Meteorological Organization](#).


Read More: [Weather Monitoring by IMD](#)

Cancer Drugs Tislelizumab and Zanubrutinib

India is set to get access to two new cancer drugs named **Tislelizumab and Zanubrutinib**.


- Tislelizumab, a new immunotherapy drug, is showing effectiveness in treating advanced **esophageal squamous cell carcinoma** (Cancer that forms in the thin, flat cells lining the inside of the oesophagus).

- Zanubrutinib is a type of medication that inhibits a protein called **Bruton's tyrosine kinase (BTK)**, which is important for the growth and survival of certain cancerous blood cells.
 - It has been approved for the treatment of specific types of **blood cancers**.
- **Cancer** refers to a group of diseases characterised by the **uncontrolled proliferation and spread of abnormal cells in the body**, which can infiltrate and harm healthy tissues and organs.
- In 2019, **India had 1.2 million new cancer cases and 930,000 deaths, making it the second-highest contributor to the disease burden in Asia** for that year.
 - The cancer cases in the country are projected to increase from 14.6 lakh in 2022 to 15.7 lakh in 2025, as per the [Indian Council of Medical Research](#).



WORLD CANCER DAY


4th February




Drishti IAS

Cancer is a leading cause of death worldwide, accounting for nearly 10 million deaths in 2020, or nearly 1 in 6 deaths.


Most Common Cancers




Breast



Lung




Colon




Rectum and prostate cancers


Around 1/3rd of deaths from cancer are due to-




Tobacco use




High body mass index



Alcohol consumption



Low fruit and vegetable



Lack of physical activity

- Cancer-causing infections, such as human papillomavirus (HPV) and hepatitis, are responsible for approximately 30% of cancer cases in low-and lower-middle-income countries.
- Many cancers can be cured if detected early and treated effectively.

Read more: [Global Burden of Cancer: WHO](#).

Note:

National Council for Cement and Building Materials-Incubation Centre

Recently, the National Council for Cement and Building Materials-Incubation Centre (NCB-IC) was inaugurated by the Joint Secretary, [DPIIT, Ministry of Commerce and Industry](#).

- At NCB-IC, the **incubated startups/entrepreneurs will be mentored** by the scientists of NCB and experts from the **cement and building materials industry** for further improvisation and development of market-ready products for commercialisation.
- The number of **DPIIT-recognised startups** has increased to **1,36,584**.

National Council for Cement and Building Materials (NCB):

- It is an apex **research and development organisation** under the administrative control of **DPIIT**.
- NCB is dedicated to research, **technology development & transfer**, education & industrial services for **cement, allied building materials & construction industries**.

Read more: [States' Startup Ranking 2022](#)

Electric Vertical Take-off and Landing Aircraft

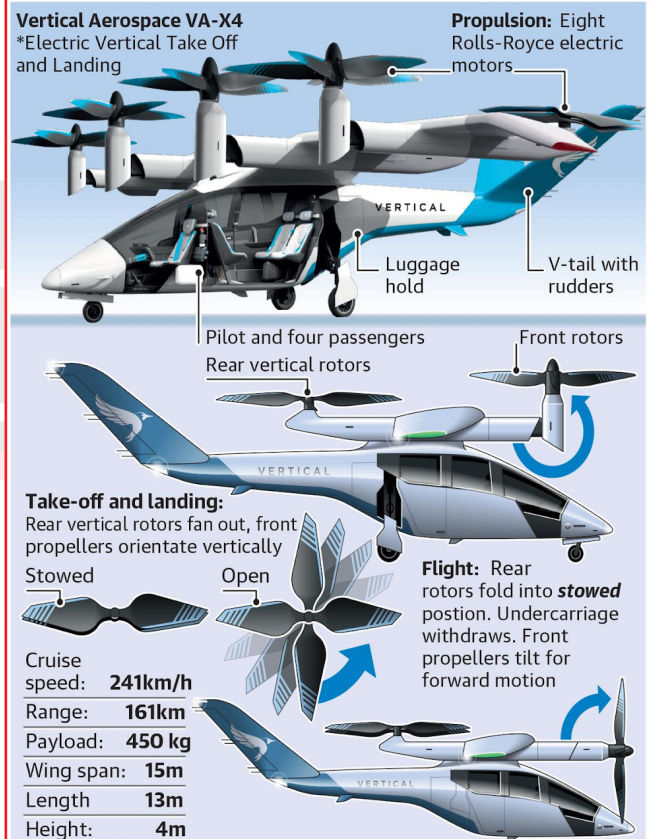
The emergence of **electric vertical takeoff and landing (eVTOL) aircraft** has captured the attention of innovators, urban planners, and commuters.

- eVTOL aircraft are a subset of **VTOL aircraft** that use electric power to hover, take off, and land vertically. Unlike **traditional aircraft**, **eVTOL aircrafts do not require runways**, making them ideal for urban environments where space is limited.
- eVTOL technology provides solutions for **daily commuting, cargo delivery, and emergency services**, with reduced maintenance and operating expenses. It has the potential to be **used for premium and emergency services in crowded urban areas**.
 - It can eliminate the need for elaborate infrastructure like helipads, and can operate at speeds of up to 200 km/h.

- **Indian Innovations:** Indian Institute of Technology, Madras-incubated ePlane Company plans to launch e-flying taxis in Bengaluru, awaiting **Directorate General of Civil Aviation (DGCA) approval**.
 - While global advancements in eVTOL are promising, **India lacks clear policies. Route planning, collaboration, and air traffic control** are essential for effective integration.

What are electric aircraft?

The Union Aviation Minister while speaking at the seventh edition of the India Ideas Conclave in Bengaluru, stated that India is in 'conversation' with a number of eVTOL producers. But how are Electric Vertical Take off and Landing aircraft structured? And what are they capable of?



Sources: Vertical Aerospace, Future Flight, Business Wire Picture: Vertical © GRAPHIC NEWS

Read more: [Electric Vertical Take off and Landing \(eVTOL\) Aircraft](#)

R21/Matrix-M Malaria Vaccine

Serum Institute of India (SII), the world's largest vaccine manufacturer (by number of doses produced and sold globally), has shipped the first set of **R21/Matrix-M malaria vaccines** to countries in Africa.

Note:

- This vaccine has been developed by the **University of Oxford** and the **Serum Institute of India**.
 - It has been recommended for use by the **World Health Organization (WHO)** after meeting required safety, quality and effectiveness standards.
 - The first malaria vaccine, **RTS,S/AS01** was recommended by WHO to prevent malaria in children in October 2021.
- **Malaria** is a life-threatening disease caused by the **plasmodium parasite**, which is transmitted to humans through the bites of infected female **Anopheles mosquitoes**.
 - As per **World Malaria report 2023**, there were 249 million cases of malaria in 2022 compared to 247 million cases in 2021.
 - In 2022, the **African Region** bore the heaviest malaria burden, with 94% of cases and **95% of deaths globally**.
- **India accounted for 1.4% of total malaria cases in the world** and saw a 30% decline in malaria cases and 34% decline in deaths in 2022 as compared to the 2021.

Read more: [R21/Matrix-M Malaria Vaccine](#)

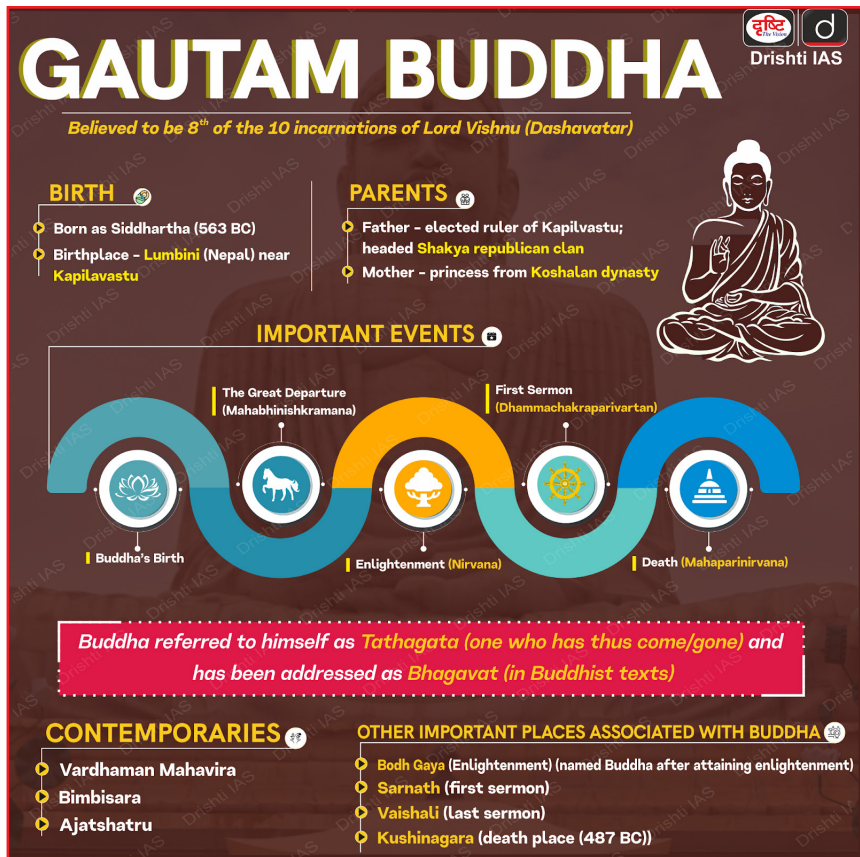
Buddha Purnima

The President of India extends greetings on the occasion of **Buddha Purnima**, highlighting the significance of **Lord Buddha's** teachings.

- Buddha Purnima also known as **Vesak**, commemorates the birth of **Prince Siddhartha Gautama**, who later became known as **Gautama Buddha** and founded **Buddhism**.
 - Celebrated primarily in South, Southeast, and East Asia, it

falls on the full moon day of the Hindu month of Vaisakha, typically in April or May.

- It is considered a '**triple-blessed day**' as it marks **Buddha's birth, enlightenment, and Maha Parnirvana**. It has been recognised by the **United Nations** as the 'UN Day of Vesak' since 1999.



Read more: [Buddha Purnima](#)

Matua Community

The Matua community of West Bengal has been demanding the implementation of the **Citizenship Amendment Act, 2019**.

- The Matuas are a depressed class of **Bengali Hindus who are part of the Scheduled Caste group of Bengal**. Millions of Matuas have migrated to India before and after the 1971 war that created **Bangladesh**, fleeing religious persecution.
- The Namasudras (Matuas) constitute **17.4% of the total Scheduled Caste (SC) population** in West Bengal, making them the second-largest group after the **Rajbanshis** in North Bengal.
- **Harichand Thakur**, a social reformer, is considered the founder of the **Matua Mahasangha**, a federation representing the Matua community.
 - It opposed caste oppression and work towards education and social upliftment of Dalits.

Read more: [Citizenship Amendment Act: Unpacked](#)

Note:

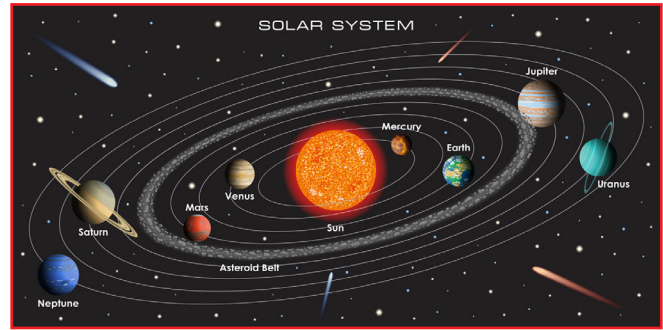
Mystery Behind Venus' Extreme Dryness

Recently, scientists have suggested that a reaction, called the **HCO+ Dissociative recombination Reaction (DR)** that occurs above the surface of **Venus**, is responsible for the disappearance of water in the planet.

- DR occurs when HCO+ absorbs an electron and breaks up into CO and a hydrogen atom which then escapes into space, losing out water without evaporation.
 - Other reasons cited by scientists:
 - **Venus' harsh atmosphere** caused by a greenhouse effect from CO₂.
 - **Venus' proximity to the Sun** (heat and UV rays breaking down water molecules into H and O₂ atoms).
- **Venus (Earth's twin)** is the second planet from the Sun, and the sixth largest planet.
 - It is the **2nd brightest** natural object in the night sky after the Moon.
 - Venus has no moon or satellite of its own.
 - Only Venus and Uranus rotate in a **clockwise direction** on their axis, while others rotate in anti-clockwise direction.
 - A day on Venus is actually longer than a year, as it takes longer for Venus to complete one rotation on its axis than to orbit the Sun.
- **Indian International Booker Prize Laureate:**

Year	Author	Work
1971	V.S. Naipaul	In a Free State
1981	Salman Rushdie	Midnight's Children
1997	Arundhati Roy	The God of Small Things
2006	Kiran Desai	The Inheritance of Loss
2008	Aravind Adiga	The White Tiger
2022	Geetanjali Shree	Tomb of Sand

Read more: [Tomb of Sand' won International Booker Prize](#)



Read More: [Venus' Tectonic History](#)

International Booker Prize 2024

Recently, the International Booker Prize 2024 was awarded to "Kairos" written by **Jenny Erpenbeck**, and translated by **Michael Hofmann**.

- The International Booker Prize, formerly known as the **Man Booker International Prize**, established in 2005, is awarded annually for a single book translated into English and published in the **United Kingdom or Ireland**.
 - The **prize aims to promote global fiction** and celebrates the work of translators.
- **Prize Money:** The award comes with 50,000 pounds (USD 64,000), shared equally between the author and the translator.
 - The shortlisted authors and translators each receive 2,500 pounds.

Note:

International Day of Biodiversity

The **International Day for Biological Diversity (IDB)**, celebrated on **22nd May 2024**, raises awareness about the importance of biodiversity for sustaining life on Earth.

- **“Be Part of the Plan,”** the theme for 2024, highlights the importance of a united effort to combat biodiversity loss and implement the **Kunming-Montreal Global Biodiversity Framework**.
- International Day for Biodiversity (IDB):
 - In 2000, the **United Nations General Assembly (UNGA)** officially proclaimed **22nd May** as IDB.
 - On **22nd May 1992**, the initial text of the United Nations Convention on Biological Diversity (UNCBD) was adopted.
 - **UNCBD is a legally binding treaty** to conserve biodiversity.
 - **India is a party to the convention** and enacted the **Biological Diversity Act, 2002**.
 - **Biodiversity** as a concept, first coined by **Walter G. Rosen in 1985**, encompasses the **diversity of all life forms**, including **plants, bacteria, animals, and humans**.
 - The UNGA designated the years **2011-2020** as the **United Nations Decade on Biodiversity**, aiming to advance the implementation of a strategic plan for biodiversity.

Read more: **Global Biodiversity Framework Fund, Convention on Biological Diversity**

Manipur Thangjing Hills Dispute

The Manipur police have registered a **zero First Information Report (FIR)** based on a complaint from the **Land Resources Department of the Manipur government**, alleging that the name of the hills was changed from **“Thangjing Ching” to “Thangting”** without government approval.

- The Thangjing Hill is of historical importance and has been declared a **protected site by the Government of Manipur**. It is located in the buffer zone between Churachandpur and Bishnupur districts and is contested by **Kukis and Meiteis for religious and cultural significance**.

- The Kuki-Zo people have always called it Thangting Hills and the Meitei people have always referred to it as Thangjing Ching or Thangjing Hills.
- The conflict over the right to pray and worship on the hill range has escalated since the ethnic conflict between the **Kuki-Zo and Meitei communities began in 2023**.

Read more: **Violence in Manipur**

Manipuri Pony

Recognising the urgent need to save the **Manipuri Pony, also known as the Meitei Sagol**, the Government of Manipur has joined hands with various organisations and associations to take a host of decisions aimed at preventing it from vanishing into history.



- The **Meitei Sagol** is one of the seven recognised horse and pony breeds of India.
 - The others include the Marwari Horse, the Kathiawari Horse, the Zanskari Pony, the Spiti Pony, the Bhutia Pony and the Kachhi-Sindhi Horse.
- It is regarded as the **original polo pony**, as the traditional **Sagol Kangjei sport** of Manipur gave rise to **modern polo**.
- The **Manipuri Pony Conservation and Development Policy (MPCDP)** was framed in 2016 to conserve the breed.
 - The population of the Manipuri Pony has been rapidly declining, from 1,898 animals in 2003 to only 1,089 in 2019, leading to the breed being declared **endangered by the Manipur government in 2013**.

Note:

- The Manipuri Pony is known for its unique characteristics, such as **stamina, agility, intelligence, speed, manoeuvrability, and adaptability** to harsh climatic conditions.
 - The ponies are deeply embedded in the Manipuri way of life, being used in traditional events, and sports, and even serving as mounts for the Manipur Kingdom's cavalry in the past.

SC to Revisit 1995 Order of Consumer Court

The recent **Supreme Court** ruling on **lawyers' liability** under the **Consumer Protection Act** has prompted a reconsideration of the **1995 decision** regarding **medical professionals**.

- The recent Supreme Court decision recently ruled that **lawyers are not liable** under the **Consumer Protection Act**, contradicts a 1995 verdict regarding medical professionals.
- In the 1995 case of **Indian Medical Association vs V P Shantha**, the Supreme Court ruled that **medical professionals provide a "service"** as defined in the Consumer Protection Act and **can be sued** in consumer court for providing faulty service.
- The 1995 ruling has now been **referred to a larger bench** for **reconsideration** in light of the recent judgement on lawyers.
- The **Consumer Protection Act of 2019**, replaced the earlier 1986 Act. It establishes the **Central Consumer Protection Authority (CCPA)** to actively promote, safeguard, and enforce consumer protections.

CONSUMER PROTECTION ACT 1986	PROVISIONS	CONSUMER PROTECTION ACT 2019
No separate regulator	Regulator	Central Consumer Protection Authority (CCPA) to be formed
Complaint could be filed in a consumer court where the seller's (defendant) office is located	Consumer court	Complaint can be filed in a consumer court where the complainant resides or works
No provision. Consumer could approach a civil court but not consumer court	Product liability	Consumer can seek compensation for harm caused by a product or service
District: up to ₹20 lakh State: ₹20 lakh to ₹1 cr National: above ₹1 cr	Pecuniary jurisdiction	District: up to ₹1 cr State: ₹1 cr to ₹10 cr National: Above ₹10 cr
No provision	E-commerce	All rules of direct selling extended to e-commerce
No legal provision	Mediation cells	Court can refer settlement through mediation

Read more: [Consumer Protection Act of 2019](#)

Humboldt Glacier

Recently, Venezuela has become the first country to likely lose all its glaciers due to climate change.

- The **last remaining glacier, Humboldt**, has shrunk significantly and is now classified as an **ice field**.
- **Venezuela** used to be **home to six glaciers** (5 of them vanished by 2011), located about 5,000 metres above sea level in the **Andes mountains**.
- The **Andes mountains**, have experienced significant temperature increases, accelerating glacier melt.
 - These are the **mountain systems of South America** with an **average height of 8,900 kilometres**.
 - It ranges from the **southern tip of South America** to the continent's northernmost coast on the Caribbean covering parts of **Argentina, Bolivia, Chile, Colombia, Ecuador, Peru, and Venezuela**.
- The **2023 El Nino event** further intensified melting in the Humboldt Glacier.
- Similar to Venezuela, many glaciers worldwide are disappearing faster than expected, with **two-thirds of total glaciers projected to vanish by 2100**, according to a 2023 study.
 - **Hindukush Himalayan glaciers** also face a major threat, potentially losing **80% of their volume by 2100** if **greenhouse gas emissions** remain high.

Note:



Read more: [2023 El Nino event](#)

Kharkiv and Kyiv Region

Amid the ongoing [Russia-Ukraine war](#), Russia has started a military operation by sending troops across the border into the northeastern **Kharkiv region** of **Ukraine**.

- Ukraine initially pushed back Russian forces from the region in late 2022, but is now facing a new offensive due to ammunition and manpower shortages.



- The **Russia- Ukraine war** has been raging for two years, causing widespread displacement, impacting Europe's geopolitical landscape, and disrupting the global economy.
- **Ukraine** is located in **eastern Europe**, the second largest on the continent after Russia. The capital is **Kyiv**, located on the **Dnieper River** in north-central Ukraine.

- Kharkiv city lies in northeastern Ukraine. It lies at the confluence of the **Uda**, **Lopan**, and **Kharkiv** rivers.

Read more: [Russia-Ukraine Conflict](#)

Massive Fire at Union Carbide Plant

Recently, a massive fire occurred at the **Union Carbide factory in Bhopal**, which was shut down after the [Bhopal Gas Tragedy of 1984](#).

- The locals expressed their fear about the potential effects of toxic smoke on their bodies.
- The **Bhopal gas tragedy** was one of the worst industrial accidents in history that occurred on the night of **2-3 December 1984** at the **Union Carbide India Limited (UCIL) pesticide plant**.
- It exposed people and animals to the highly toxic gas [methyl isocyanate \(MIC\)](#), causing immediate and long-term health effects and deaths.
- The cause of the gas leak is debated between corporate negligence and employee sabotage.
- As a result several laws were passed related to disaster and environmental protection in India.
- **Bhopal Gas Leak Disaster Act of 1985**,
- [Environment Protection Act of 1986](#),
- [Public Liability Insurance Act of 1991](#),
- [Civil Liability for Nuclear Damage Act of 2010](#)

Read more: [Lingering Health Effects of Bhopal Gas Tragedy](#)

Indian Army Gets AK-203 Rifles

The **Indian Army** has received the first batch of 27,000 units of **Russian AK-203 assault rifles**.

- Under a contract signed between India and Russia in July 2021, over **6.1 lakh AK-203 assault rifles** are to be manufactured in India with technology transfer from Russia.
- The joint venture **Indo-Russian Rifles Private Limited (IRRPL)** was established at Korwa in Uttar Pradesh in 2019 for this purpose.
 - It was set up between the erstwhile **Ordnance Factory Board** [now **Advanced Weapons and Equipment India Limited (AWEIL)** and **Munitions India Limited (MIL)**] from India and **Rosoboronexport (RoE)** and **Kalashnikov concern** of Russia.

Note:

- India is progressively making the AK-203 rifles within the country, aiming to reach **70%** domestic content in just 2 years. Currently, around **25%** of the rifle's parts are manufactured locally.
- The full-scale production with 100% localisation of rifles is expected to be reached within 2-3 years.
- The Indian Army has been phasing out the **INSAS (Indian National Small Arms System)** rifles in favour of more advanced weaponry.

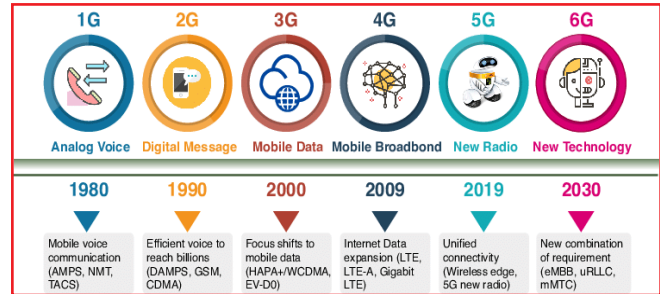


Read More: [AK-203 Rifles](#)

World Telecommunication and Information Society Day

The [Department of Telecommunications \(DoT\)](#) celebrated World Telecommunication and Information Society Day on **17th May 2024**, with the theme **“Digital Innovation for Sustainable Development”**.

- The day marks the anniversary of the founding of the **International Telecommunication Union (ITU)** on 17th May 1865, when the first **International Telegraph Convention** was signed in **Paris**.
- [Centre for Development of Telematics \(C-DOT\)](#), the premier Telecom R&D Centre of DoT announced special Initiatives **“NIDHI”** & **“STAR Program”** for the development of **indigenous telecom solutions & technologies**.
 - **STAR Program** provides scholarship and mentorship support from C-DOT research leaders to PhD students.
- The **Telecom industry in India** is the **2nd largest** in the world with a subscriber base of 1.179 Billion as of August 2023 (wireless + wireline subscribers).
 - It is integral to the **digital economy** and is projected to reach around **USD 1.5 billion** by **2025-26**, making up approximately **15%** of the **GDP**.



Read more: [India's Booming Telecom Sector, Transformative Impacts of Telecommunications Act 2023, 6G Technology](#)

Stellar Nucleosynthesis

Stellar nucleosynthesis is the process by which stars create the elements inside their cores. The only element **not formed in this way** is **hydrogen**, the most abundant and lightest element in the universe.

- Stellar cores have crushing pressures and temperatures, reaching up to **15 million °C** in the Sun's core. In these harsh conditions, the nuclei of atoms undergo **nuclear fusion**.
 - The **hydrogen nucleus**, which is just one proton, comes together to form **helium nuclei (two protons and two neutrons)** in the p-p (proton-proton) process.
 - In more massive stars, the **carbon-nitrogen-oxygen (CNO) cycle dominates**, where the nuclei of these elements come together in different ways to form **elements from helium onwards**.
 - CNO cycle involves hydrogen fusing into helium, catalysed by carbon, nitrogen, and oxygen isotopes.
 - As a star runs out of nuclei to fuse, its core contracts, increasing the temperature and triggering further nuclear fusion.
 - This process continues until the **star starts producing iron**, the lightest element for which fusion consumes more energy than it releases.
 - Elements heavier than iron can only be synthesised outside a star when it goes **supernova**.

Read More: [Nuclear Fusion Energy](#)

Note:

Centre Granted Citizenship Under CAA

The **Union Government** has granted citizenship certificates to over 300 people who applied under the **Citizenship (Amendment) Act (CAA), 2019**.

- The **Citizenship Amendment Rules, 2024**, were notified by the **Ministry of Home Affairs** on 11th March 2024, that paved the way for the implementation of the **CAA** after 4 years since its passage by **Parliament** in December 2019.

What the rules state

Centre has implemented CAA, 4yrs after the law was passed, as it notified rules ahead of expected announcement of LS polls

THE 39-PAGE NOTIFICATION... of the Citizenship (Amendment) Rules, 2024

...STATES THAT AN APPLICANT WILL HAVE TO SUBMIT

<ul style="list-style-type: none"> • Form VIII A, with affidavits verifying statements and character of applicant 	<ul style="list-style-type: none"> • Declaration that they have adequate knowledge of a language specified in 8th schedule of Constitution 	<ul style="list-style-type: none"> • Supporting papers like a passport, or identity document to show someone in lineage was a citizen of one of the three countries
--	---	--

APPLICANT MUST ALSO PROVE

<p>1 They entered India before December 31, 2014</p>	<p>2 The applicant or either of his parents was a citizen of Independent India</p>
---	---

WHAT IS THE 2019 ACT? CAA made people from Hindu, Sikh, Jain Buddhist, Christian and Parsi faiths who entered India from Afghanistan, Bangladesh and Pakistan eligible for citizenship

- The CAA provides citizenship to **undocumented migrants** from **6 non-Muslim communities** (Hindu, Sikh, Buddhist, Jain, Parsi, or Christian) from **3 neighboring countries** (Afghanistan, Bangladesh, and Pakistan), who entered India on or before **31st December 2014**.
 - It also reduced the period to qualify for citizenship from existing **11 years** to **5 years**.
 - The Act states that such minorities “**shall not be treated as illegal migrants**” and will be **exempted from punishable sections** under **Section 3 of the Passport (Entry into India) Act, 1920** and the **Foreigners Act, 1946**.
 - The insertion of **Section 6B** allows such migrants to obtain citizenship through **registration** and **naturalisation**.
 - **Section 6B** (introduced by the CAA of 2019 to the **Citizenship Act of 1955**) outlines a specific process for acquiring Indian citizenship by naturalisation for migrants from 3 neighbouring countries mentioned.

Read More: [Citizenship Amendment Act: Unpacked](#), [Centre Notifies Rules for CAA Implementation](#), [Citizenship \(Amendment\) Act, 2019](#)

Football Legend Sunil Chetri

Sunil Chhetri, the Indian football captain, has announced his retirement from international football after playing his last match against Kuwait on 6 June 2024.

Note:

- He is currently 3rd among active players in terms of **goals scored**, behind only **Cristiano Ronaldo** and **Lionel Messi**. He also ranks 4th on the all-time list of international goal-scorers.

Awards and Achievements	
Trophies	AFC Challenge Cup: 2008 SAFF Championship (4): 2011, 2015, 2021, 2023 Nehru Cup (3): 2007, 2009, 2012 Intercontinental Cup (2): 2018, 2023 Tri-Nation Series: 2023
Awards and Accolades	AIFF Player of the Year (7): 2007, 2011, 2013, 2014, 2017, 2018–19, 2021–22 FPAI Indian Player of the Year (3): 2009, 2018, 2019 SAFF Championship Player of the Tournament (4): 2011, 2015, 2021, 2023 SAFF Championship Top Scorer (3): 2011, 2021, 2023 Football Ratna Award (first recipient) by Football Delhi: 2019
National Awards	Dhyan Chand Khel Ratna Award : 2021 Padma Shri : 2019 Arjuna Award : 2011

- The AIFF manages the game of football in India. It was founded in 1937, and gained FIFA affiliation in the year 1948, after India's independence in 1947.

Sunil Chhetri

Career Statistics



For India	
Debut	Jun 12, 2005
Appearances	150
Goals	94
Trophies won	11
Club football	
Appearances	339
Goals	146

Read More: [Indian Football's Vision 2047](#)

Bleaching of Sea Anemone

Researchers studying **Sea Anemones** (*Actiniaria*) in the **Lakshadweep** group of islands have observed a large-scale **bleaching** event among the anemones off **Agatti island**. Sea anemone bleaching has been observed in Lakshadweep islands for the first time.



- **Sea anemone bleaching** refers to the process in which sea anemones lose their vibrant colours and turn white or pale due to **loss of symbiotic photosynthetic algae** from them.
 - This can occur due to environmental stressors such as **rising water temperatures, pollution, or changes in ocean chemistry**.
 - Bleaching causes sea anemones to lose their primary source of energy, rendering them more susceptible to diseases and leading to higher mortality rates.

Note:

- **Sea anemone** is an aquatic animal marked by soft bodies and an ability to sting.
 - They are part of the *Cnidaria phylum* family and are found in ocean waters, particularly in **coastal tropical areas**.
 - They are close associates of corals and live rocks. They also form symbiotic bonds with **clownfish**, providing protection in exchange for food from the clownfish's meals.
 - Sea anemones play vital biogeochemical roles in **benthic ecosystems** (lowest ecological zone in a water body, and usually involves the sediments at the seafloor).
- **Agatti Island** is at a distance of 459 km (248 nautical miles) from Kochi (Kerala) and is located to the west of Kavaratti Island.



Read More: [Agatti Island of Lakshadweep](#)

Nobel Prize Laureate Alice Munro

Recently, **Alice Munro**, a Nobel laureate in Literature, passed away, leaving behind a legacy of over twelve short story collections and the 2013 **Nobel Prize** itself as testaments to her significant literary contributions.

Note:

- Munro also won the [Man Booker International Prize](#) in 2009 and the **Giller Prize** - Canada's most high-profile literary award, twice.
- She gained worldwide recognition for her exceptional skill in crafting short stories. Munro's stories explored a range of human experiences, including **love, desire, dissatisfaction, ageing, and ethical dilemmas**.

Nobel Prize

- ✦ Established by the will of Alfred Nobel (inventor of Dynamite)
- ✦ Awarded to those who have conferred the greatest benefit to humankind, during the preceding year
- ✦ First awards were handed out in **1901**

The infographic features a central circular portrait of Alfred Nobel with the inscription 'ALFR. NOBEL' and his birth and death dates in Roman numerals: 'NAT. MDCCC XXXIII' and 'OB. MDCCC XCVI'. Surrounding the portrait are six categories of the Nobel Prize, each with a representative icon and the awarding institution:

- PHYSICS**: Royal Swedish Academy of Sciences (Icon: Atom symbol)
- CHEMISTRY**: Royal Swedish Academy of Sciences (Icon: Laboratory flask)
- PHYSIOLOGY OR MEDICINE**: The Nobel Assembly at Karolinska Institutet (Icon: Plus sign)
- LITERATURE**: The Swedish Academy (Icon: Open book)
- PEACE**: Norwegian Nobel Committee (Icon: Peace symbol)
- ECONOMIC SCIENCES**: Royal Swedish Academy of Sciences (created in 1968 by Sweden's Central Bank) (Icon: Money symbol)

- ✦ The Prize Ceremony is held in Stockholm, Sweden, in December every year
 - ▲ The Peace Prize is not awarded at Stockholm ceremony but presented annually in Oslo, Norway, on the same day
- ✦ Each Nobel laureate receives a gold medal, a diploma, and a monetary award
- ✦ Nobel Prize cannot be given posthumously (after death). Also, up to 3 people can share a Nobel Prize award between them

- ✦ **First Indian Nobel Laureate: Rabindranath Tagore for Literature, 1913**
- ▲ **First Indian Woman Nobel Laureate: Mother Teresa for Peace, 1979**

Read more: [Nobel Prize](#), [Man Booker International Prize](#)

Note:

7th Edition of Exercise Shakti

The 7th edition of the joint **military exercise 'Shakti'** between India and France commenced in Umroi, Meghalaya, marking a significant collaboration in enhancing tactical capabilities.

- Exercise "Shakti" is a biennial training event conducted alternatively in India and France. The last edition took place in France in November 2021.
- **Focus Areas:** Exercise Shakti aims to enhance joint military capability of both sides to undertake multi-domain operations in a **sub-conventional scenario under Chapter VII of the United Nations Mandate.**
 - The joint exercise will focus on operations in the semi-urban and mountainous terrain.
- **Tactical Objectives:** Tactical drills will include responses to terrorist actions, the establishment of joint command posts, and intelligence and surveillance centres, emphasising readiness and coordination.
- **Other Joint Exercises between France and India:** **Exercise Varuna, Exercise Garuda, and Exercise Desert Knight.**

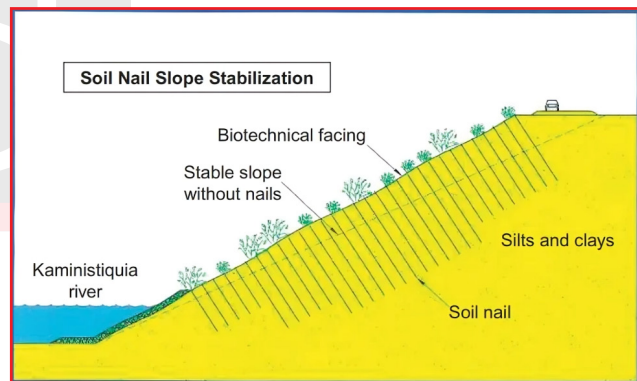


Read more: [India-France Relations](#)

Soil Nailing and Hydroseeding for Landslide Prevention

In a proactive move to address the **persistent problem of landslides** in the ecologically sensitive **Nilgiris region**, the State highways department is implementing a sustainable **'green' solution using the soil nailing and hydroseeding technique.**

- Soil nailing is a **geotechnical engineering technique that involves the insertion of reinforcing elements into the soil to strengthen it** and prevent soil erosion.
- Following the soil nailing process, the **'hydroseeding'** method will be applied, which **involves the application of a mixture of seeds, fertiliser, organic materials, and water onto the soil** to facilitate the growth of grass and plant-life.
 - Around five species of grasses, including a few local species native to India, will be grown along the slopes.
 - The highways department will be responsible for the maintenance of the grasses once the hydroseeding is completed.
- This **'green'** solution of preventing landslides through soil nailing and hydroseeding will help mitigate the impact of linear infrastructure, such as roads, in the ecologically sensitive Nilgiris region.



Read more: [Building Resilience Against Landslides](#)

World Lupus Day 2024

World Lupus Day, observed annually on **10th May**, is a crucial event that aims to shed light on the challenges faced by individuals living with **lupus**. This complex autoimmune disease affects millions worldwide.

- Lupus causes the **immune system** to attack the **body's own tissues and organs**, leading to symptoms like joint pain, rashes, fever, and fatigue. It can also result in severe complications like osteoporosis and cardiovascular issues.
 - Factors such as **genetics**, smoking, hormones, environmental influences, and stress can increase the risk of developing lupus.

Note:

- Established in 2004 by the **World Lupus Federation**, World Lupus Day aims to spread awareness and rally global support for lupus patients.
- With nearly **5 million sufferers worldwide**, this day emphasises the need for better **healthcare, increased research, early diagnosis, and improved treatments for lupus**. It also aims to unite organisations and individuals in reducing the suffering caused by this potentially fatal disease.

Tileswari Koch-An Unsung Hero of Assam

Tileswari Koch was a young freedom fighter and an active member of the **Indian National Congress (INC)** from Dhekiajuli in Assam.

- She was shot at the age of 12 by the British on 20th September 1942, during the **Quit India Movement** when she and some freedom fighters tried to unfurl the Tricolour atop a police station in Assam.
- **Quit India Movement** was started by **Mahatma Gandhi** on **8th August 1942** during the **All-India Congress**

Committee session in **Mumbai** to **demand an end to British rule**.

- He gave the call for **“Do or Die”** in his speech delivered at the **Gowalia Tank Maidan**.
- This movement changed the nature of political negotiations with the British, ultimately paving the way for **India’s independence**.
- The INC was founded at **Bombay** in **December 1885** by A.O. Hume, a retired British official.
 - It was formed to facilitate civil discussions between Indians and the British.
 - The **early phase** of the INC was led by **moderate leaders like Dadabhai Naoroji, GK Gokhle** which relied more on moderate demands and constitutional methods.
 - While later from 1905 onwards, Congress was led by **extremists leaders like Bal Ganagdhra Tilak, Lala Lajpat Rai** who demanded complete independence and advocated for more radical approaches.

Read More: [Quit India Movement](#), [Indian National Congress](#)

Nakuru Dam

Kenya has recently reported that **Nakuru Dam** has experienced a catastrophic failure due to heavy blockage in an underpass tunnel diverting water to the **Tongi river**.

- The blockage resulted from **severe rainfall** and the accumulation of **debris, stones, and soil**.
- The heavy rains and flash floods are also wreaking havoc in neighbouring countries like **Tanzania, Uganda, Ethiopia, and Somalia**.
- **Kenya** is located in **East Africa**. Its terrain rises from a low coastal plain on the **Indian Ocean** to mountains and plateaus at its centre.
 - It is renowned for its **wildlife habitats**, including the **Masai**



Note:

Mara, where annual migrations of wildebeest and zebras occur.

- The bones of one of the **earliest human ancestors** ever found were discovered in **Kenya's Turkana Basin**.
 - It was a *Homo erectus* and is famously known as "**Turkana Boy**."
 - **UN-Habitat** maintains its headquarters at the **United Nations Office** at Nairobi, Kenya.
- Read More: [India-Kenya Ties](#)

Liquid Nitrogen

The **Tamil Nadu Food Safety Department** has issued a circular on the use of liquid nitrogen saying the substance can only be used to preserve **packaged food**, and use other than this is prohibited.

- **Liquid nitrogen** is primarily used as **Food Preservatives** as it increases shelf-life of packaged foods.
 - It **expands** 700 times when it evaporates, displacing oxygen in the food pack and preventing microbial action, improving shelf life and freshness.
 - It is an **Inert, colorless, odorless cryogenic fluid**.
- It is also used in **cryotherapy** for **cancer** treatment. It can treat many cancers, including those of skin, bone, breast, cervical, eye, kidney, liver, lung, and prostate.

Sperm Whales

Researchers investigating the **Sperm Whales** (*Physeter macrocephalus*), have outlined the fundamental aspects of their potential communication methods for the first time.

- Sperm whales utilise **rapid clicks** underwater, resembling the sound of an exceptionally loud zipper, for communication and echolocation purposes, aiding in prey tracking.
 - These clicks are thought to constitute a "**phonetic alphabet**" enabling the whales to construct words and phrases.
- The sperm whale is dark blue-grey or brownish, with white patches on the belly.
 - They are the **largest of the toothed whales and have one of the widest global distributions** of any marine mammal species.



- They are found in **temperate and tropical waters** throughout the world.
- They have the **largest brains** of any animal and live in **matriarchal groups** of about 10.
- They are listed as **vulnerable** in the **IUCN Red List**, mentioned in **Appendix I of CITES and included in Schedule 1 of the Wildlife (Protection) Act, 1972**.

Read More: [Sperm Whales](#)

Interim Bail to Delhi Chief Minister

The **Supreme Court of India** has granted **interim bail** to the Delhi **Chief Minister** after he was arrested by the **Enforcement Directorate** in the **Delhi Liquor Policy case** in March 2024.

- The court stated that **temporary release**, known as "**interim bail**", can be granted in certain cases where there are **compelling reasons and grounds**, even if regular bail would not be considered justified.
 - Bail is the **temporary release of an accused person awaiting trial**, usually granted upon payment of a set amount of money to the court.
 - The purpose of bail is to ensure that the **accused will return for their court** appearances.
 - Bail is typically granted at the **discretion of the court**, based on factors such as the severity of the alleged crime, the defendant's criminal history, and the likelihood of fleeing.
 - **Interim bail** is granted temporarily during the pendency of a case when regular bail cannot be immediately obtained.
 - The term "**interim bail**" is **not** explicitly defined in the **Code of Criminal Procedure (CrPC)**.

Note:

BAIL AND RELATED PROVISIONS IN INDIA

"The issue of bail is one of liberty, justice, public safety, and burden of the public treasury, all of which insist that a developed jurisprudence of bail is integral to a socially sensitised judicial process."

—Justice V.R. Krishna Iyer

Constitutional Provision for Arrest - Article 22:

Grants protection to individuals arrested or detained, with detention classified into two types:

- ➔ **Punitive detention:** To punish a person for an offence committed by him after trial and conviction in a court
- ➔ **Preventive detention:** Detention of a person without trial and conviction by a court

Criminal Procedure Code, 1973: Doesn't define bail, but defines bailable and non-bailable offences:

Type of Offence	Bailable	Non-Bailable
Defined under CrPC as:	An offence mentioned in Schedule 1, or An offence made bailable by any other law	Any offence other than bailable
Power to Grant Bail	Bail as a right	Court/Police discretion based on the facts

Bail vs Parole vs Probation

Bail	Parole	Probation
Temporary release of defendant awaiting trial or appeal, secured by deposit to guarantee their appearance in court Granted by Judge	When person gets some time off from jail sentence , for instance, to fulfil some requirements By Parole Board	Suspension of sentence of an offender, allowing to stay in community under supervision of an officer By Judge

Types of Bails in India

- Regular Bail:** Court's order to release person under arrest in police custody
- Interim Bail:** Court grants temporary relief until application for Anticipatory Bail or Regular Bail is decided
- Anticipatory Bail:** Bail granted preemptively to prevent arrest
- Default Bail:** When police fail to complete investigation within specified period
- Medical Bail:** Solely on medical grounds

Cancellation of Bail - Certain Grounds

- Misuses his liberty** by indulging in criminal activity
- Interferes with course of investigation**
- Tampering of evidence**
- Threatens witnesses, etc**



Read more: [Revised Guidelines for Parole and Furlough: MHA](#)

Quotas for PwDs in All Trains

The **Ministry of Railways** has approved quotas for **People with Disabilities (PwDs)** in all trains, irrespective of whether any concessional fare facility is available or not.

- PwD quota will be earmarked in **all reserved Express/Mail trains**.

- To avoid misuse of the provision, **Verified Indian Railways Unique Identity Cards** will be issued to eligible by Indian Railways, and tickets under this quota will be booked using this Card only.
 - The **Centre for Railway Information Systems (CRIS)** was instructed to update its reservation software to verify Unique Identity Cards on all trains, including those without concessional fares.

Note:

- **CRIS**, an **Autonomous Organization** under the Ministry of Railways, is tasked with developing and overseeing essential **IT applications** for the Indian Railways.

➤ **Initiatives undertaken in India to empower persons with disabilities include:**

- [Rights of Persons with Disabilities \(RPwDs\) Act, 2016](#)
- [Unique Disability Identification Portal](#)
- [Accessible India Campaign](#)
- [DeenDayal Disabled Rehabilitation Scheme](#)
- [Assistance to Disabled Persons for Purchase/fitting of Aids and Appliances, National Fellowship for Students with Disabilities](#)
- [Divya Kala Mela 2023](#)

Read More: [Vande Bharat Trains](#) , [People with Disabilities \(PwDs\)](#)

Visit of Indian Naval Ships to Malaysia

Recently, Indian Naval ships, **INS Delhi** and **INS Shakti**, visited Kota Kinabalu, Malaysia as part of the Indian Navy's Operational Deployment. The visit aims to strengthen the friendship and cooperation between India and Malaysia through a series of engagements and activities.

- The Indian Navy ships will participate in a **Maritime Partnership Exercise (MPX)/ PASSEX** at sea with ships of the Royal Malaysian Navy to **enhance interoperability** between the two Navies.
 - **INS Delhi** is the **first indigenously designed** and built **Project-15 class** guided missile destroyer, while **INS Shakti** is a Fleet Support Ship, both part of the Indian Navy's Eastern Fleet.
- **India-Malaysia Relations:**
 - Surrounded by busy sea lines of communications such as the **Strait of Malacca** and the **South China Sea**, Malaysia is a key pillar of **India's Act East policy** and critical to **India's maritime connectivity strategies**.
 - India and Malaysia have signed the Comprehensive Economic Cooperation Agreement (CECA). CECA is a kind of Free Trade Agreement (FTA).
 - Joint defence exercises between India and Malaysia:
 - **Army:** Exercise Harimau Shakti

- **Airforce:** Exercise Udarashakti
- **Navy:** Exercise Samudra Laksamana



Read More: [India-Malaysia Defence Cooperation](#)

Red Colobus

A recent study suggests that **Red Colobus Monkeys**, a rare and endangered population of monkeys found in various regions of **Africa** are facing threats to their survival and are at risk of becoming extinct.

- These monkeys act as **"indicator species,"** meaning their presence and well-being reflect the overall health of the forest ecosystem.



- Colobines are primarily **leaf-eaters**. They also play a vital role in **seed dispersal**, contributing to the regeneration of diverse plant life.
- Their **unique digestive system** allows them to **consume and disperse seeds**, ensuring the continuation of various plant species.

Note:

- Across Africa, there are 17 red colobus species (18 if subspecies are counted), spanning from **Senegal to the Zanzibar Archipelago**.
- 14 of them are classified as **Endangered or Critically Endangered on the IUCN Red List of Threatened Species**.

Read More: [IUCN Red List Update 2023](#)

Project ISHAN

India has started the process of consolidating its 4 airspace regions into a single entity spanning the entire nation under Initiative **Indian Single Sky Harmonized Air Traffic Management (ISHAN)**.

- Currently, Indian airspace is divided into **4 Flight Information Regions (FIRs)** in Delhi, Mumbai, Kolkata, and Chennai, each managed separately.
 - Under **ISHAN**, these will be consolidated into one continuous airspace centred in **Nagpur**.
 - It seeks to **streamline and enhance air traffic management** across India.
- The **Airports Authority of India (AAI)**, invited expressions of interest (EoI) for the preparation of a detailed project report.

- AAI was constituted by an Act of Parliament and came into being on 1st April 1995 by merging erstwhile **National Airports Authority and International Airports Authority of India**.
- It works under the **Directorate General of Civil Aviation**, Ministry of Civil Aviation, Government of India.

Read More: [India's Aviation Industry](#).

Tartessos Civilization

Archaeologists of the **Spanish National Research Council** unearthed five stone faces in **Guarena, Spain**, dating back to the extinct **Tartessos Civilization**.

- Tartessos Civilization existed around 3000 years ago (9th-6th centuries BCE) in Huelva and Cadiz. This region was bordered by a large gulf connected to the **Mediterranean Sea**.
- Tartessos was a blend of **Iberian and Phoenician influences**, known for trade, metalwork, and maritime skills, thriving until its decline, likely triggered by economic shifts, environmental challenges, and conflicts with neighbouring cultures.



Read More: [Mediterranean Sea](#)

World Migration Report 2024

The **World Migration Report 2024** was launched by the **International Organization for Migration (IOM)**, revealing significant shifts in global migration patterns. World Migration Report is IOM's flagship report released biennially.

Note:

- The report highlighted that **Mexico, China, the Philippines, and France** were the other four nations in the top five remittance recipient countries, with **India being the top country** receiving remittances in **2010, 2015, 2020, and 2022**.
- International remittances increased by 650% from **USD 128 billion to USD 831 billion** between 2000 and 2022 with **India receiving the highest remittances at USD 111 billion** in 2022 followed by Mexico.
 - **USD 647 billion** of the total remittances were sent by migrants to low- and middle-income countries.
- Despite remittances acting as a crucial source of income for many South Asians, migrant workers from the region remain vulnerable to various challenges.
 - These challenges include **financial exploitation, excessive debt** incurred due to migration costs, **xenophobia** (hostility towards foreigners), and workplace abuses.
 - The **number of displaced people** hit a record high by the end of 2022 at **117 million**.
- **India is the origin of the largest number of international migrants** in the world (nearly 18 million), with large diasporas in countries like the UAE, the US, and Saudi Arabia.
 - According to the report, India has a slightly **higher share of female immigrants than males**. Countries with a significantly high proportion of **male emigrants** include India, Bangladesh and Pakistan.
- **Gulf Cooperation Council (GCC)** countries remain significant destinations for migrant workers, **especially from India**, Egypt, Bangladesh, Ethiopia, and Kenya, employed in sectors like construction, hospitality, security, domestic work, and retail.

Read more: [Remittance Inflow](#) , [International Migration Outlook 2023](#)

NOTTO-ID

Recently, the centre has expressed its concern over the violations of Laws related to **Organ Transplantation** in India.

- Centre has urged States to direct the appropriate authority under the **Transplantation of Human Organs & Tissues Act (THOTA), 1994**, to investigate transplants in respect of foreign nationals in the State.

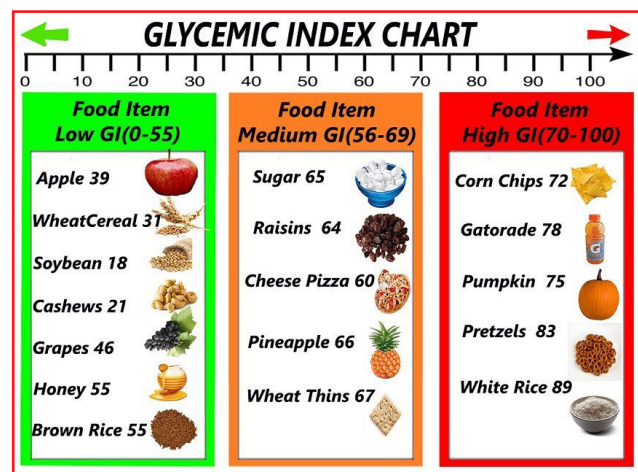
- It has also directed the states to ensure that a **NOTTO (National Organ and Tissue Transplantation Organisation) ID** is generated for the donor and recipient for both **living-donor** as well as **deceased-donor** transplants.
 - **NOTTO-ID** is **mandatory** for considering allocation of organs in case of **deceased-donor transplant**.
- Centre has directed that this ID in case of a **living-donor transplant** shall also be generated at the earliest, maximum within **48 hours** after the transplant surgery is done.
- As per the Indian law, **Commercial Trading of the Organ is Not Allowed**.
 - Organ can be donated by a living person only if they (donor and recipient) are **close relatives** or share a **close bond** and want to **donate altruistically**.

Read More:[Reforming Organ Transplantation](#)

Glycemic Index and Glycemic Load

Recent evidence strongly supports the significance of **Glycemic Index (GI)** and **Glycemic Load (GL)** in diets, particularly in relation to the increased risk of type 2 diabetes.

- **Glycemic index (GI)** is a measure of the 'Quality' of **Carbohydrates** in food.
 - It refers to the property of the food to increase the **Blood Glucose Level**.
 - For comparison, the GI of glucose is taken as **100** and the GI of other foods are given as a percentage of this.



Note:

- **Glycemic Load (GL)** is obtained by multiplying GI by the amount of the carbohydrate consumed.
 - The GL is a measurement tool that takes into account portion sizes.
- This Study is relevant for **India and South Asia** because here carbohydrate consumption is high in the form of high GI **White Rice** or **Wheat**, leading to **Very High GL** of our diets.

Read More: [Erythritol](#)

World Hydrogen Summit 2024

The **Indian Pavilion**, organised by the **Ministry of New and Renewable Energy**, stands as one of the largest at the esteemed **World Hydrogen Summit 2024 in Rotterdam, Netherlands**. It serves as a platform to showcase the nation's notable advancements in **green hydrogen**.

- **India's Green Hydrogen Initiatives:** India launched the **National Green Hydrogen Mission (NGHM)** in **January 2023** with a budget of Rs. 19,744 crores.
 - The mission aims to achieve a green hydrogen production capacity of 5 MMT (Million Metric Tonnes) by 2030. Currently, tenders have been awarded for setting up 412,000 tonnes of Green Hydrogen production capacity and 1,500 MW of electrolyzer manufacturing capacity.
 - Under NGHM a **dedicated portal was launched to provide information on the mission** and steps for developing the green hydrogen ecosystem in India.
 - India has also released scheme guidelines for the use of **Green Hydrogen in steel, transport, and shipping sectors**.

- The **Department of Science and Technology** has initiated **Hydrogen Valley Innovation Clusters** to foster innovation and promote the green hydrogen ecosystem in India.

NATIONAL GREEN HYDROGEN MISSION

NODAL MINISTRY

- ▶ Ministry of New and Renewable Energy

OBJECTIVE

- ▶ Decarbonise energy/industrial/mobility sector
- ▶ Develop indigenous manufacturing capacities
- ▶ Create export opportunities for GH₂ and its derivative

COMPONENTS OF NGHM

- ▶ Strategic Interventions for Green Hydrogen Transition Programme (SIGHT)
- ▶ Strategic Hydrogen Innovation Partnership (SHIP) (PPP for R&D)

Expected Outcomes by 2030

- ◆ Atleast 5MMT GH₂ annual production
- ◆ Rs 1 lakh crore fossil fuel import savings
- ◆ 6 lakh jobs
- ◆ 50MMT CO₂ annual emissions averted
- ◆ ₹ 8 lakh crore investment

HYDROGEN AND GREEN HYDROGEN

Hydrogen is the most common element in nature but exists only in combination with other elements. It has to be extracted from naturally occurring compounds (like water).

Green Hydrogen (GH₂) is made by splitting water through an electrical process called electrolysis, using an electrolyser powered by renewable energy (RE).

Grey hydrogen: Natural gas → Hydrogen + CO₂

Blue hydrogen: Natural gas → Hydrogen + CO₂ (Underground storage)

Green hydrogen: Green electricity + Water → Hydrogen + O₂

Read more: [Green Hydrogen - Substitute to Fossil Fuel](#)

Note: