

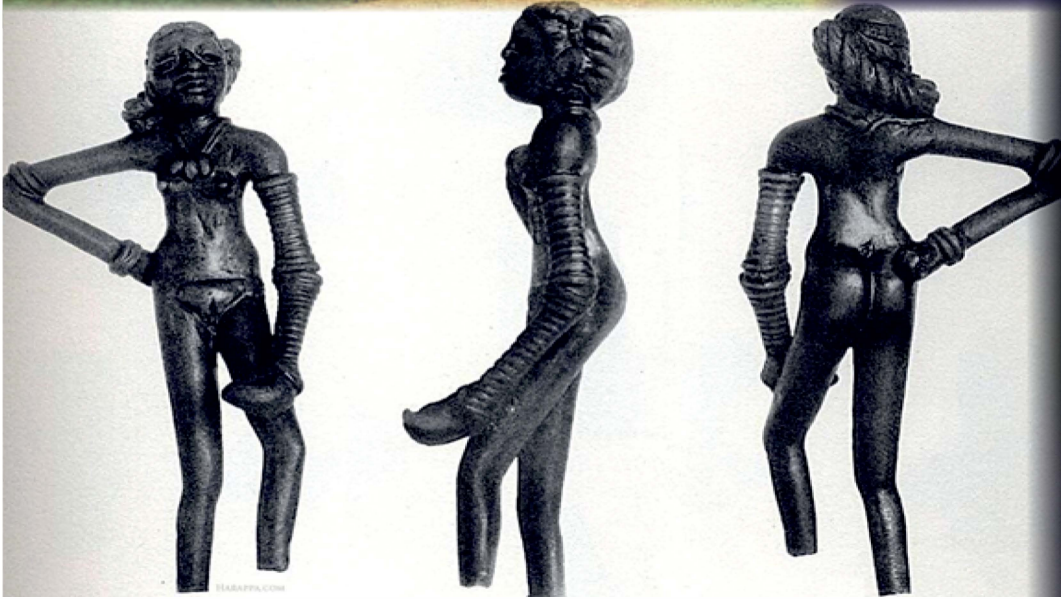


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**ACE**

# CURRENT AFFAIRS

*for*  
**UPSC CSE**

**JUNE 2023**



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# POLITY

## MAHARASHTRA JUDGEMENT

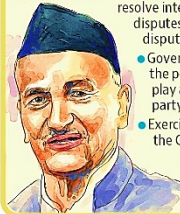
**In News:** The Supreme Court recently held that the then Maharashtra Governor's call for a trust vote, which led to the resignation of the Uddhav Thackeray government, was illegal.

- Supreme Court made strong observations about the role of the then Governor of Maharashtra and the Speaker of the Legislative Assembly and **refrained from interfering** with the proceedings **related to disqualifying 16 MLAs**, including Chief Minister Eknath Shinde.
- The five Judge Constitution Bench of the Supreme Court **upheld the Governor's decision of inviting Eknath Shinde** to form the Government in the State of Maharashtra and **refused to quash Uddhav Thackeray's resignation** as it was submitted voluntarily before the floor test.

## Cast of characters: What the verdict says...

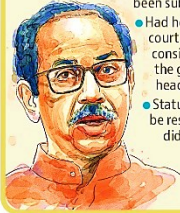
### BHAGAT SINGH KOSHYARI THEN GOVERNOR

- Governor must be cognisant of the constitutional bounds of the power vested in him
- Governor had no objective material on the basis of which he could doubt the confidence of the incumbent government
- Floor test cannot be used as a medium to resolve internal party disputes or intraparty disputes
- Governor cannot enter the political arena and play a role in internal party disputes
- Exercise of discretion by the Governor in this case was not in accordance with the law



### UDDHAV THACKERAY FORMER CHIEF MINISTER

- Thackeray did not face the floor test on June 30, 2022, and instead submitted his resignation
- Court cannot quash a resignation that has been submitted voluntarily
- Had he not resigned, court could have considered reinstating the government headed by him
- Status quo ante cannot be restored because he did not face the floor test and tendered his resignation



### EKNATH SHINDE MAHARASHTRA CHIEF MINISTER

- Shinde was not barred from taking over as CM since disqualification petition against him is still pending
- A claim must be established according to the procedure established by the law
- Governor was justified in inviting him to form govt
- He staked the claim with majority after Uddhav Thackeray resigned
- If the Speaker holds him disqualified, he will no longer be eligible to be the CM



### DEVENDRA FADNAVIS DEPUTY CHIEF MINISTER

- Made no attempt to issue a notice for a no-confidence motion against MVA government
- Nothing prevented him from moving a no-confidence motion
- A request to ask Uddhav Thackeray to prove majority was not good enough for Governor to order a floor test
- No infirmity in his writing to the Governor with a letter of support of 106 BJP MLAs for Shinde



### RAHUL NARWEKAR, SPEAKER

- He was duly elected as the Speaker
- Support of MLAs from the Shinde-camp does not vitiate his appointment
- His decisions on recognising Shinde as leader of the Shiv Sena legislature party is illegal
- Notifying Bharat Gogawale as chief whip of the Shiv Sena is also bad in law
- He will recognise the leader of the party and the chief whip afresh
- All disqualification petitions will be decided by him



## Background

- In 2022, the government in Maharashtra led by Uddhav Thackeray was replaced by a new government led by a faction of the Shiv Sena and Eknath Shinde, the **leader of the breakaway Sena group**, who became the new Chief Minister.
- Mr Shinde submitted the **initial petition** after 40 rebel MLAs received notices from the **Deputy Speaker** of the Maharashtra Assembly **under the 10th Schedule of the Constitution**, which deals with disqualification on the grounds of defection.
- The Thackeray group **filed a petition challenging both the decision of the Maharashtra Governor to call for a trust vote before resigning and the election of the new speaker.**

## Floor test/Trust vote

A floor test is primarily taken to know whether the **executive enjoys the confidence of the legislature**. It is a **constitutional mechanism** under which a **Chief Minister appointed by the Governor** can be asked **to prove a majority** on the floor of the Legislative Assembly of the state.

## SUPREME COURT RULING

### On disqualification:

- The Supreme Court refrained from interference, stating that the matter of **disqualification should be decided as per procedures established in law** and the **Speaker is the appropriate authority** for this under the **Tenth Schedule of the Constitution**.
- SC said as there are **no extraordinary circumstances** in the instant case that warrant the **exercise of jurisdiction** by this Court **to adjudicate disqualification petitions**, and the Speaker must decide disqualification petitions within a **reasonable period**.
- SC observed that an **MLA has the right to participate in the proceedings of the House** regardless of the **pendency of any petitions for their disqualification** and **validity of the proceedings of the House** in the interregnum (the period between a regime change) is **not 'subject to' the outcome of the disqualification petitions**.

### 10<sup>th</sup> Schedule of the Constitution

- It is also known as the "**Anti-Defection Law**," and was added by the **52nd Amendment Act of 1985**.
- It lays down the provisions related to the **disqualification of Members of Parliament (MPs) and state legislatures** based on defection.
- Its aim is to **promote political stability and discipline** by preventing elected members from changing parties after being elected.

#### **A member can be disqualified if**

- if he/she has **voluntarily given up his membership** of such political party; or
- if he/she **votes or abstains from voting** in such House **contrary to any direction issued by the political party**.

#### **Disqualification on grounds of defection is not to apply in case of a merger**

- Defection due to **party mergers/or functioning as a separate group is not considered a disqualification**.
- The **91st Constitutional Amendment Act, of 2003** modified the conditions for a merger, now requiring **at least two-thirds of the members** to support it for it to be legally valid.

#### **Decision on questions as to disqualification on grounds of defection**

If any question arises as to whether a member of a House has become subject to disqualification, the **decision of the speaker of the House shall be final**.

**Bar of the jurisdiction of courts-** Notwithstanding anything in this Constitution, **no court shall have any jurisdiction** in respect of any matter connected with the disqualification of a member of a House under this Schedule. (subject to **reasonable time of 3 months** to decide on disqualification).

### On Floor Test:

- The Court noted that the **Governor was not justified** in calling the **incumbent government to prove his majority** on the floor of the House **“because he did not have reasons based on objective material before him”**, to show that

Issues	Shinde Faction	Thackeray Faction	Judgement
Should <i>Nabam Rebia v Deputy Speaker (2016)</i> be reconsidered?	No. <i>Nabam Rebia</i> has no bearing on present case.	Yes. The Judgement renders anti-defection law ineffective.	Yes. 2016 Bench did not consider misuse of freezing Speaker's power.
Can a Speaker facing removal conduct disqualification proceedings?	No. Once a removal notice is issued, the Speaker loses this power.	Yes. A mere removal notice cannot freeze the powers of the Speaker.	To be clarified by larger Bench reconsidering <i>Nabam Rebia</i> .
Does the Shinde faction's rebellion amount to defection?	No. The rebellion was merely internal dissent, not defection.	Yes. The Shinde faction missed mandatory meetings, and disobeyed the Whip.	Speaker to decide whether the rebellion amounts to defection.
Can a faction of a Legislature party declare itself to be the 'real' political party based on in-House majority?	Yes. All members of a party have an inalienable right to protest.	No. Members of the Legislature party are to act per the instructions of the political party.	No. Legislature party is elected based on its association to political party.
Was the Governor right to call for a floor test?	Yes. Governor is duty bound to call for floor test as he received a letter expressing discontent.	No. By calling for a trust vote Governor recognised a 'split' within the party. Split no longer recognised in anti-defection law.	No. The Shinde faction expressed discontent in the party, not in the House. Governor has no role in inter or intra-party politics.

the incumbent government had lost the confidence of the House.

- The SC said that **“status quo ante cannot be restored”** as the incumbent government **did not face the floor test** and **resigned from the post** and Governor was justified in inviting Mr. Shinde to form the government.
- SC said that Floor test cannot be used to **resolve internal party disputes**, as the power of the Governor to act without the aid and advice of the Council of Ministers is of an extraordinary nature and must be exercised with circumspection within the limits of law.

### Appointment of Whip:

- The provisions of the Tenth Schedule indicate that the **Whip and the Leader must be appointed by the political party and not by the legislature party**, thus the **courts cannot be excluded by Article 212** from inquiring into the validity of the action of the Speaker recognizing the Whip.
- The Speaker must recognize the Whip and the Leader who is duly authorised by the political party **with reference to the provisions of the party constitution**, as the decision of the Speaker recognising Mr Shinde as the Leader, was held illegal.
- SC said that the direction to vote in a particular manner or to **abstain from voting is issued by the political party and not the legislature party**.
- SC observed that allowing the **legislative wing to act independently from the political party contradicts the constitutional system of governance**.
- Political party** represents common **political goals and ideologies** and should decide on the appointment of whip, whereas the **legislature party** is a part of the same political party and plays a crucial role in **law making procedures, holding the government accountable and deliberations**.

### Concurrent Jurisdiction of Speaker and EC:

- The Court refused to hold that the **ECl is barred from adjudicating petitions** under Paragraph 15 of the Symbols Order **until the “final adjudication” of the disqualification petitions under the Tenth Schedule**, as an order of the speaker is barred from the passage of time.
- The disqualification proceedings before the Speaker **cannot be stayed** in anticipation of the decision of the ECl.
- The court stated that both the **Speaker and the EC can adjudicate issues concurrently**.

## Reconsideration of Nabam Rebia's Case

- The Court directed Nabam Rebia's case judgement to be reconsidered by a 7-judge bench because **a substantial question of law** remains to be settled.
- The SC framed the question **"whether the issuance of a notice of intention to move a resolution for the removal of the Speaker restrains them from adjudicating disqualification petitions under the Tenth Schedule of the Constitution"**.

### Nabam Rebia & Bamang Felix v. Deputy Speaker (2016),

- Supreme Court ruled that it would be **"constitutionally impermissible for a Speaker of the House to adjudicate upon disqualification petitions under the anti-defection law as per Tenth Schedule while a motion of resolution for his/her own removal from Office of Speaker is pending"**.
- The SC said that the **power to summon the House** is not solely vested in the Governor and **should be exercised with the aid and advice of the Council of Ministers** and not at his own.

### Article 163

- **It requires the Governor of a State to act in consultation with the Council of Ministers in the exercise of his functions.** He can act at his discretion only when he is required to. The Court confirmed that the Governor does not enjoy broad discretionary powers and is always **subject to constitutional standards.**

### Article 174

- It confers the Governor with the power to **summon, prorogue or dissolve the legislature of the State** only on the aid and advice of the Council of Ministers.
- SC said If the **Speaker and the Government attempt to circumvent a no-confidence motion**, the Governor **would be justified** in exercising the power under **Article 174 without the aid and advice of the Council of Ministers.**

## Can the Status quo ante be restored?

- The Supreme Court could not quash the resignation as the same was submitted voluntarily, but if ex-CM had refrained from resigning, the court could have considered a remedy to reinstate his government.

### Criticism of 10<sup>th</sup> schedule:

- **Merger:** gets validated with only the numbers and does not get into the **ethicality of reason for merger**. Eg. horse trading, ministerial berth, etc.
- **Individual stand: obedience** to party whip leads to violation of principles of representative democracy.
- **Overriding power to speaker:** since the speaker is still a **member of the political party**, the power of disqualification should be given to a neutral authority (President/Governor) who should act on the advice of Election Commission.



## UNIFIED ACCREDITATION FOR HIGHER EDUCATION INSTITUTIONS (HEIs)

**In News:** Highlighting that **only 30% of India's HEIs are accredited**, a recent report by the central government's **Overarching Committee (Radhakrishnan Committee)** has put forth several significant recommendations to reform the **assessment and accreditation system** of **higher education institutions (HEIs)** in India.

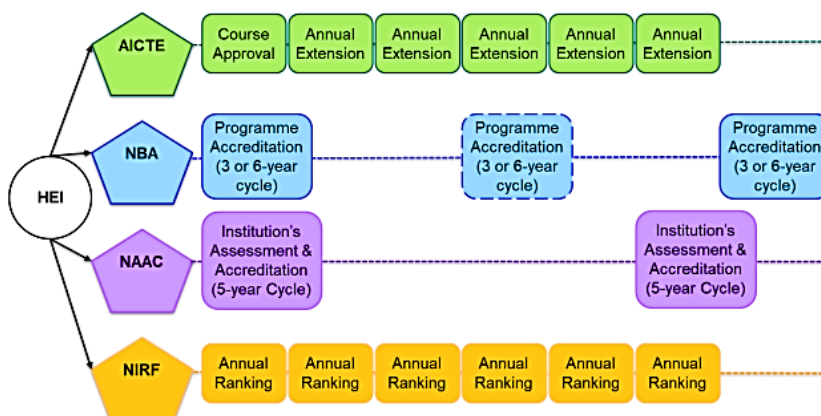
- The report titled **'Transformative Reforms for Strengthening Periodic Assessment and Accreditation of All Higher Educational Institutions in India'** proposes a complete overhaul of the current system and suggests a more **simplified and streamlined process**.

Present Accreditation System	NEP 2020 Vision
• Score-based, Multiple Grade Accreditation	• Binary Accreditation
• Portal Self-Disclosure	• Public Self-Disclosure
• Approved Peer Team of Individuals	• Approved Accrediting Institutions
• One-Size-Fits-All Model	• University-Type-Based process
• Input-Process-Limited-Outcome approach	• Outcome-Based approach
• Generic policy benefits as an incentive for accreditation	• Empirical policy benefits to motivate accreditation

- It proposed a more simplified and binary **"Accredited, Awaiting Accreditation and Not Accredited"** system, instead of the present 8-point grading system of the **National Assessment and Accreditation Council (NAAC)**.
- It recognised the need to streamline and synergize the accreditation process of the **National Assessment and Accreditation Council (NAAC)**, **National Board of Accreditation (NBA)**, and **National Institute Ranking Framework (NIRF)**.
- It also emphasised the **mentoring of institutions** that fall significantly below the accreditation standards.
- Proposed a **'Unified Elicitation Tool'** to collect the superset of data from HEIs for the varied purposes (of approval, accreditation, scoring/ranking) with single point data entry by HEIs

### Present Accreditation System Pitfalls:

- Low level of **willingness** of HEIs for **periodic approvals**, assessment, accreditation and ranking of HEIs due to **multiplicity of agencies**.
- Cumbersome**, all-encompassing information requirements
- Overarching **subjective processes**
- Inconsistencies** between assessment standards of different agencies.



## Institutions under National Educational Policy, 2020

- NEP 2020 envisions that the distinct functions of **regulation, accreditation, funding, and academic standard** setting will be performed by distinct, independent, and empowered bodies
- The functioning involves the four independent verticals for **Regulation (NHERC), Accreditation (NAC), Funding (HEGC), and Academic Standard Setting (GEC)**.
- These bodies will be working synergistically within one umbrella institution, the **Higher Education Commission of India (HECI)**.

## Intent of Reforms in Accreditation

- Create a **simple, trust based, credible, objective, and rationalised system** for **approval, accreditation, and ranking** of HEIs: **Composite Assessment System**
- Enable **Choice-based Ranking System**: diverse course, students, funding agencies, industries etc.)

Criteria	Proposed Category of HEIs #
Orientation and Vision	1. Multi-disciplinary Education and Research-Intensive
	2. Research-Intensive
	3. Teaching-Intensive
	4. Specialised Streams
	5. Vocational and Skill-Intensive
	6. Community Engagement & Service
Heritage and Legacy	○ Old and Established Institute
	○ New and Upcoming Institute

(Note: # More categories may be added as required)

- Have a **verifiable** and **secured centralised database**: crowdsourcing, single-point data entry, validation of data
- Use **technology-driven modern systems** that could replace/minimise **manual involvement**
- **Mentor and incentivise** HEIs: to become institutes of **national eminence and global standards**.

## Impact of Accreditation

- Improves **student enrolment**- quality and quantity and their **employability**.
- Encourages **quality improvement initiatives**
- Helps in securing **necessary funds**.
- Facilitates **transnational recognition of degrees** and **mobility** of graduates and professionals.
- Achieves educational **outcome rather than inputs**

## National Board of Accreditation (NBA)

- An **autonomous organisation** under the Union Ministry of Education, does binary accreditation of programmes in technical disciplines for either 6-year or 3-year-block periods.
- It's tasked with **accrediting only technical education** institutions.
- It is also in charge of bringing out the **annual ranking of higher education institutions**, also known as the NIRF.
- NBA represents India in the '**Washington Accord**'.
- **Washington Accord** is an international agreement to streamline the process of accrediting engineering degree programmes globally to facilitate young engineers to travel overseas for studies or work.

### National Institutional Ranking Framework (NIRF)

- It ranks the participating higher education institutions, annually in terms of overall rank and discipline-specific ranks.
- Based on five broad sets of parameters, NBA continues to rank institutions on behalf of NIRF.

### All India Council of Technical Education (AICTE)

- It does the mandatory **annual approval** of all programmes/courses in technical educational institutions etc., following processes (mostly online).

### National Accreditation Council (NAC)

- It has been envisaged as the '**meta-accrediting body**', with responsibility for overseeing and supervising an independent ecosystem of **accrediting institutions**.

### Conclusion:

- Integration and strengthening of periodic assessment and accreditation of all higher educational institutions in India is a significant step towards achieving the goals of the National Education Policy 2020.
- **Unified Accreditation for HEIs** will create a unified, simplified, and transparent system that will enhance the quality and excellence of HEIs in India.

### DECEPTION DETECTION TEST (DDT)

**In News:** The Wrestling Federation of India chief Brij Bhushan Sharan Singh said that he was willing to undergo a narco-analysis or any other lie detector test provided the wrestlers too took the same test.

### What is a narco test?

- In the narco test, a drug called **sodium pentothal** is injected into the body of the accused, which transports them to a **hypnotic or sedated state** in which their **imagination is neutralised**.
- In this state, the accused is understood as **being incapable of lying** and is expected to **divulge information** that is true.



- Sodium pentothal is a **fast-acting, short-duration anaesthetic** used in larger doses to sedate patients during surgery.
- Since the drug is believed to weaken the subject's resolve to lie, it is sometimes referred to as a "**truth serum**".

### Supreme Court Ruling on Narco Test: Selvi vs. State of Karnataka, 2010

- The use of deception detection tests like narcoanalysis, brain mapping and polygraph tests on the accused, suspected and witnesses to a crime, without their consent, was unconstitutional and violated their right against self-incrimination and right to life and personal liberty.
- Such test results could not be admitted in evidence.
- However, any **information/ material subsequently discovered** with the help of tests undertaken voluntarily, could be **admitted**.

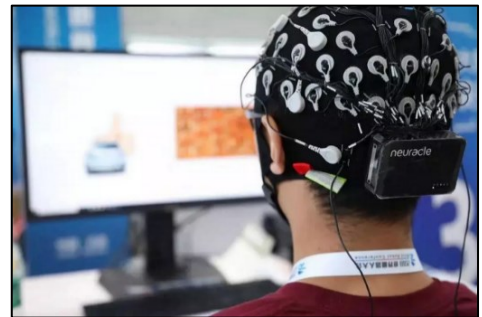
## Polygraph Test

- Sometimes also referred as **lie-detector test**, a polygraph tests measures the **sudden changes physiological responses/hyper-arousal** which are triggered when one is lying.
- It detects the responses through **attached instruments** like cardio-cuffs or sensitive electrodes.
- It **measures fluctuations** in blood pressure, pulse rate, respiration, change in sweat gland activity, blood flow, etc., while the suspect is being questioned.



## Brain Mapping:

- Also known as **P-300 test**, here subjects are exposed to **auditory or visual stimuli** (pictures, videos and sounds) that are relevant to the facts being investigated alongside other irrelevant words and pictures.
- Such stimuli can be broadly classified as **material 'probes' and neutral 'probes'**.
- The underlying theory is that in the case of guilty suspects, the exposure to the material probes will lead to the **emission of P300 wave components** which will be duly recorded by the instruments.



Although, all these deception detection test methods have the **same motive**, i.e. **decoding the truth**, they have **different working, shortcomings and success rate**.

## INTERNET SHUTDOWN

**In News:** The supreme court has issued a notice to the central government seeking compliance with guidelines laid down in **Anuradha Bhasin Vs Union of India and others** case judgement of 2020.

### Anuradha Bhasin Case

- **Anticipating a law-and-order situation** in J&K due to abrogation of article 370, the government had imposed an **internet ban throughout** the erstwhile state.
- Ms. Anuradha Bhasin, the editor of Kashmir Times Srinagar Edition debated that internet is an **important technology for modern press** and shutting it down led to forceful shutdown of print media as well.
- It was also argued that the government failed to consider whether the internet shutdown was **reasonable and proportionate** to the aims as during its imposition, and **neither law and order, nor public order was at risk** when the order was passed.

### SC Judgement

- An **indefinite suspension** of internet services would be **illegal** under Indian law and that orders for internet shutdown must satisfy the **tests of necessity and proportionality**.
- The government order exists only for a **temporary period of time** must be **published** and **made available for general public** at the earliest.
- Section 144 of Criminal Procedure Code, 1973 **cannot** be used to suppress **the legitimate exercise of fundamental rights**.
- The restrictions are **subject to scrutiny** by the judiciary.

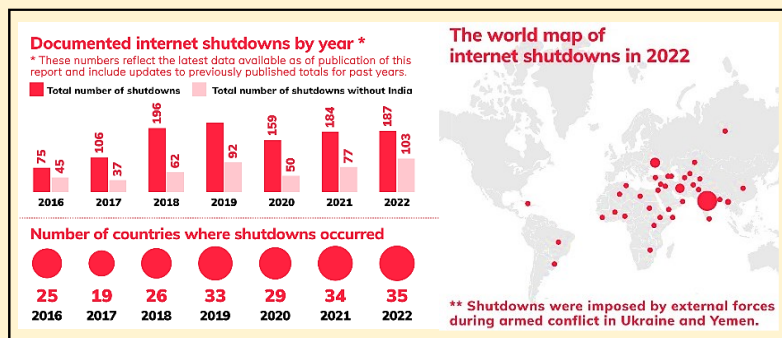
- That **Freedom of Speech and Expression** as mentioned under article 19(1) (a) of the Constitution of India enjoys constitutional protection over the **medium of the internet** as well.

### Rules on Internet Shutdown

- Orders under **Temporary Suspension of Telecom Services** (Public Emergency & Public Safety) Rules, 2017, under the Indian Telegraph Act, 1885 provide for **temporary shutdown** of telecom services in a region **up to 15 days** at once.
- These orders are issued on grounds of **public emergency and public safety** (not defined in the Indian Telegraph Act).
- Authority to order shutdown lies with **Home Ministry at the central and state levels**.
- The order is later reviewed by a committee headed by **Cabinet/chief secretary** in their respective jurisdiction.
- Before 2017, internet shutdown orders were **issued by DMs of the district** under **Section 144 of CrPC**, who continue to pass such orders.

### India as the Internet Shutdown Capital of the World

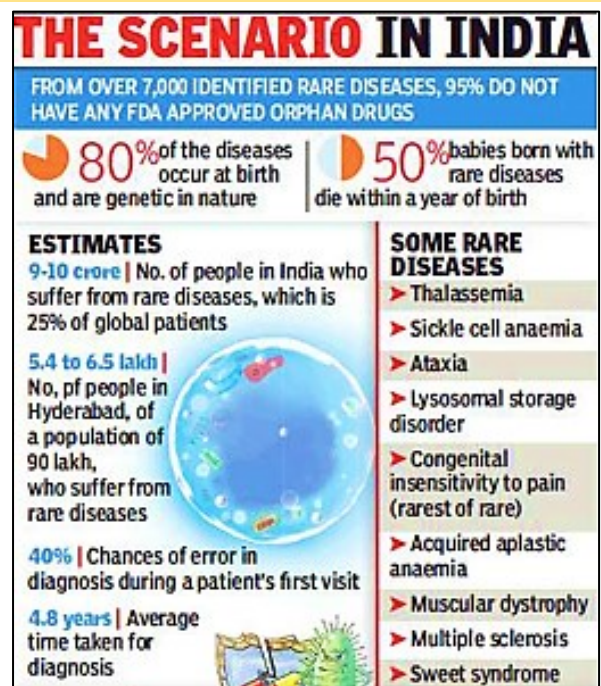
Since 2016, India has accounted for approximately **58% of all shutdowns** documented in the Shutdown Tracker Optimization Project (STOP database by an agency Access Now).



### RARE DISEASE POLICY

**In News:** Delhi High Court sets up a 5-member panel to implement the centre's **rare diseases policy** in an efficient manner and ensure its benefits reach patients.

- Delhi High Court has been hearing a batch of petitions by rare disease patients and their caretakers, seeking **timely and affordable treatment** under the policy.
- The **National Rare Diseases Committee** to implement the policy in an efficient manner and to **explore procurement/create logistical framework** and **indigenization of therapies and drugs for rare diseases**.
- The committee will look into the cases of **patients enrolled** with AIIMS-Delhi and the manner in which their treatment can begin.



- The court has also asked the **National Consortium for Research, Development and Therapeutics for rare diseases** to look after R&D of indigenous treatment for rare diseases, manufacturing of drugs, and inclusion of people in clinical trials.

**Rare diseases** are those that **affect a small number of people** compared to the general population and often have **no definitive cure**.

WHO defines rare disease as often **debilitating lifelong disease or disorder** with a prevalence of **1 or less, per 1000 population**.

### **National Policy for Rare Diseases 2021**

- The policy aims to **lower the incidence and prevalence** of rare diseases in India by adopting a preventive and comprehensive strategy, and to enable access to affordable health care for patients.
- The policy categorises rare diseases into three groups:
  - Group 1:** Disorders amenable to **one-time curative treatment**.
  - Group-2:** Diseases requiring **long term/lifelong treatment** having relatively **lower cost** of treatment and benefit have been **documented in literature** and annual or more **frequent surveillance** is required.
  - Group 3:** Diseases for which definitive treatment is available but challenges are to make optimal patient selection for **benefit, very high cost and lifelong therapy**.
- The policy provides for financial support up to **Rs. 20 lakhs** under the **Umbrella Scheme of Rashtriya Arogya Nidhi** for treatment of Group 1 diseases and upto Rs 50 lakhs outside its ambit along with treatment at Centres of Excellence.
- For Group 2 diseases, state governments can consider supporting patients with **special diets, hormonal supplements or other low-cost interventions**.
- For Group 3 diseases, the policy proposes to create a **digital platform for voluntary crowdfunding and donations** for treatment.
- The policy also envisages the establishment of **Centres of Excellence and Nidan Kendras for diagnosis, screening and management of rare diseases**, as well as the development of manpower and research capacity in this field.
- Patients, mostly children get registered with the '**Digital Portal for Crowdfunding and Voluntary Donations for Patients of Rare Diseases**' by the Union Health Ministry.
- It was finalised and put in public domain by the Ministry of Health and Family Welfare in March 2021.

### **Issues around Rare Diseases:**

- **Complexity and heterogeneity:** 7000-8000 rare diseases across the world, with reporting in India still at nascent stage and affecting mostly the children.
- **Lack of data, awareness, diagnosis and reporting:** hindering **easy and time access** to treatment.
- **Treatment burden:** is often **prohibitively expensive**, as most of the drugs and therapies are imported from abroad and have no generic versions available. For example, enzyme replacement therapy (ERT) for LSDs can cost up to Rs. 6 crores per year per patient.

- **All-round issue:** lack of access to **quality health care, social stigma, discrimination, and psychological distress.**
- **Priorities:** Inability of govt, to fully finance treatment due to high costs, resource constraints, and **competing health priorities.**

## CITIIS 2.0

**In News:** Government has approved Phase 2 of **City Investments to Innovate, Integrate and Sustain Project (CITIIS) project** for integrated waste management and climate-oriented reforms under Smart Cities Mission.

- The CITIIS 2.0 will be implemented in 18 cities which would be selected based on a competition.
- **Agencies involved:** Jointly implemented by the Ministry of Housing and Urban Affairs (MoHUA), **French Development Agency (AFD), KfW (Germany), European Union (EU), and National Institute of Urban Affairs (NIUA).**

• **CITIIS 2.0 three major components:**

- Financial and technical support for to promote **circular economy**, integrated waste management, and climate resilience, adaptation, and mitigation.
  - Providing support to all **States and UTs** on **demand basis** for establishing **climate centres, creating climate data observatories**, facilitating climate-driven planning, and building capacities of municipal functionaries.
  - **Climate governance:** enhanced knowledge sharing, capacity building, partnerships, etc. through interventions at all levels: Centre, State, and City.
- CITIIS 2.0 complements national programs (AMRUT, Swachh Bharat Mission, Smart Cities Mission) and commitments (NDCs and COP26 commitments).



### CITIIS 1.0

CITIIS 1.0 was launched by MoHUA in the year 2018.

- **AMRUT:** Atal Mission for Rejuvenation and Urban Transformation (AMRUT) was launched in 2015 in selected **500 cities/towns** to develop **basic infrastructure for water supply, sewerage management, storm water drainage, green spaces and parks and non-motorized urban transport.**
- AMRUT 2.0 was launched in 2021 for a period of 5 years i.e. to provide universal coverage of **functional tap water supply** and coverage of **sewerage management.** It would promote **circular economy of water** and make cities **water secure** through development of **City Water Balance Plan (CWBP)** focusing on **recycle/reuse of treated sewage, rejuvenation of water bodies, water harvesting and water conservation.**

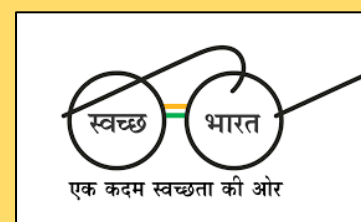
**Smart Cities Mission:** With the objective to promote cities that provide **core infrastructure, clean and sustainable environment and a decent quality of life** through 'smart solutions', the mission was launched in 2015. The focus has been to create replicable models based on selected 100 smart cities.

## Principle Basis for Smart Cities Concept



## Swachh Bharat Mission (SBM)

It was launched as a nationwide campaign to achieve **universal sanitation coverage** through mass scale **behaviour change**, construction of **household-owned and community-owned toilets** and mechanisms for monitoring toilet **construction and usage**. Launched in 2014, all villages, gram panchayats, districts, states/UTs in India declared themselves "**open-defecation free**" (ODF) by **2 October 2019** by constructing over **100 million toilets** in rural India.

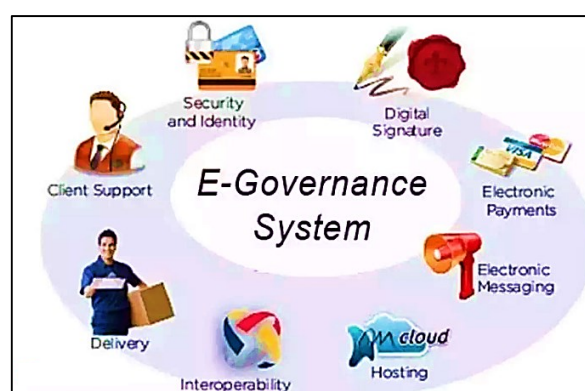


SBM 2 was launched in 2021 towards **ODF+ and ODF++ status** which include **solid and liquid waste management** facilities, making household/community toilets **more accessible and reinforcing ODF behaviour**.

## FIRST FULLY E-GOVERNED STATE: KERALA

**In News:** Kerala has become India's **first fully e-governed state**, thus making service delivery **people oriented, corruption free** and **transparent**.

- The state has introduced **e-Sevanam**, a single portal for delivering as many as **900 public services**.
- The **e-office system** has already been implemented in the state and district level administration.
- The **e-district project** would soon be extended to taluk-level offices. In **panchayats, 250 services** are now being delivered online.
- It has empowered the citizens with **digital literacy and e-services** through the **Akshaya Centres**, which are knowledge dissemination centres spread across the state.
- Declaring **internet access a citizen's right**, Kerala has launched the **Kerala Fibre Optic Network (KFON) project**, which has made internet access affordable.
- The state has also launched key e-governance initiatives and rolled out over **80 e-governance applications** for the people, covering various domains such as **health, education, certificates, payments, filing, pension, tax, licence, building permit, etc.**
- The idea is to use technology to bridge the '**digital divide**' in addition to creating a **network** of government offices and citizens.





## INDEPENDENCE OF DISTRICT JUDICIARY

**In News:** Supreme Court (SC) held that in order to uphold the **rule of law**, the independence of district judiciary becomes a part of the basic structure of the Constitution.

- A three-judge Supreme Court bench, in response to a petition by the **All India Judges Association**, issued directions to amend service rules and **ensure timely payment of pension and other retiral benefits** to the district judiciary.
- The judgment mentioned that judiciary must possess the **inherent power to compel payment** of those sums of money which are **reasonable and necessary** to carry out its mandated responsibilities, and its powers and duties to administer justice.
  - It leads to **financial security and independence**, vital for the judicial system, ensuring **impartiality** of judges.
- Importance of District judiciary independence:
  - Highest judicial authority in the district serves as the **backbone of the judicial system**.
  - Handled around **11.3 lakh cases** in a day.
  - It protects the doctrine of **separation of power**.



### Basic Structure Doctrine

- Through the **1973 Kesavananda Bharati case**, a 13-judge Constitution Bench ruled that though Parliament has the power to amend any part of the Constitution, it could not use this power to **alter or destroy its "basic structure"**. The doctrine simply says that the Constitution's fundamental features are immune to parliamentary amendments.
- **Elements** which form basic structure: Supremacy of the Constitution, republican and democratic form of government, sovereignty of the country, secular and federal character of the Constitution, demarcation of power between legislature, executive and judiciary, the dignity of the individual, welfare State, unity and integrity of the nation.
- **Criticism** of basic structure: being called as **tyranny of the unelected, no mention in Constitution**.
- **Significance:** defends individuals against **majoritarian government**, has a **moral value** and is rooted in the **principles of Constitution**. In the year 2023, India celebrates **50 years** of the institution of basic structure doctrine.

## TRANSPORTATION OF HUMAN ORGANS

**In News:** Human organs and tissue for transplants can now be transported via Metro trains, as per the **Metro Railways (Carriage and Ticket) Amendment Rules, 2023**.

- Blood, corpses, bones, human body parts, human skeletons and animal carcasses are considered **“offensive materials”** that were not allowed on Metro trains.
- The amended rules make an exception for **human organs and tissue** that is meant for **transplantation**.
- A person duly authorised by a hospital registered under the **Transplantation of Human Organs and Tissues Act, 1994** may take along human organs or tissue or both for the purpose of organ or tissue transplant.

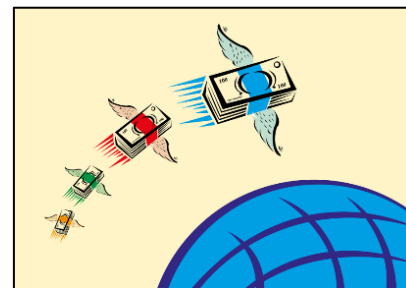




# ECONOMY

## LIBERALIZED REMITTANCE SCHEME (LRS)

**In News:** The Ministry of Finance issued a notification mentioning to **omit rule 7** of the Foreign Exchange Management (Current Account Transactions) Rules, 2000, with immediate effect.



- Rule 7 of the FEM(CAT) Rules, 2000 exempted the **use of international credit cards** from the LRS for payments by a person towards meeting expenses while such a person is on a visit outside India.
- Since, International credit cards are being issued with **limits in excess of the present LRS limit of \$ 2,50,000**, in the interest of **uniformity**, the differential treatment between debit cards and credit cards for LRS payment needed to be removed.
- The government has clarified that the changes will not apply to payments for the purchase of foreign goods/ services from India, such as subscriptions to newspapers, magazines, or online streaming services.

### Taxation on LRS:

- The budget 2023 increased the **tax collected at source (TCS)** for foreign remittances under the LRS **from 5% to 20%**, except for education and medical purposes.
- Before this proposal, a TCS of 5% was applicable on foreign outward remittances above Rs 7 lakh, and 5% without any threshold for overseas tour packages.
- For credit card linked TCS, levy of 5% will come into effect on such transactions till July 1 (except for medical and education-linked sectors), which would then increase to 20% after July 1.
- Payments abroad by an individual using their **international credit cards up to ₹7 lakh** per financial year **were exempted from the TCS levy**, but debit cards were also included within the same limit.

### Tax Collection at Source (TCS)

- It is the additional amount collected as tax by a seller of specified goods from the buyer at the time of sale, over and above the sale amount and is remitted to the government account. The TCS can later be adjusted with total tax collected.

### Criticism of TCS:

- **Tax terrorism:** undue pressure exerted by tax authorities
- Blocking of funds for honest taxpayers

### OUTWARD REMITTANCES UNDER THE LRS FOR RESIDENT INDIVIDUALS

	Apr-Feb 2022-23	Apr-Feb 2021-22	YoY change (%)
Overseas travel	12.51 (\$bn)	6.13 (\$bn)	104.1
Total outward remittances*	24.18 (\$bn)	19.61 (\$bn)	23.3

Total includes remittances for deposits, property purchases, gifts and medical treatment, among others; Source: RBI

## Government Response

- Instances where **LRS payments are disproportionately high** when compared to individuals' disclosed incomes
- **20% TCS rate is not high** as compared to the tax slab (new regime: 20% tax for incomes over ₹12 lakh and 30% for incomes over ₹15 lakh)

## Benefits of LRS

Transfer funds to their family members or friends who are residing abroad, especially during an emergency situation.

## Restrictions and Eligibility for LRS

- The eligibility for LRS transactions is **\$2,50,000 per Indian resident per financial year** for any permissible **current or capital account transaction**.
- Any amount exceeding this limit requires prior permission from RBI.
- This amount can be used for business, personal, educational, and other purposes.
- Purpose of spending: **private visits** to any country (except Nepal and Bhutan), **gift or donation**, going abroad for **employment, emigration, maintenance** of close relatives abroad, **travel** for business/conference/training, meeting **medical expenses**, accompanying as an **attendant to a patient** going abroad for medical treatment/check-up, **studies** abroad, any other current account transaction.
- Remittances under the scheme are **not permitted** for certain activities such as **real estate, the purchase of lottery tickets, margin trading, and speculation in foreign exchange markets**.
- The scheme is not available to corporates, partnership firms, HUF, Trusts, etc.

## About Liberalized Remittance Scheme (LRS)

- It is a scheme that enables Indian residents to **remit funds abroad** for certain **specified purposes** without restrictions and prior approval of RBI.
- The scheme has been one of the most important instruments for **promoting smooth transfer of funds, international trade and investment**, as well as for **facilitating capital flows** into and out of India. It was introduced in India in 2004 by the Reserve Bank of India (RBI).

## RBI ANNUAL REPORT

**In News:** Despite facing challenges from an **uninspiring global outlook**, India's growth momentum is likely to be **sustained** in 2023-24 amid **easing inflationary pressures**, the Reserve Bank of India (RBI) annual report for 2022-23.

- India's growth prospects for 2023-24 remain strong, supported by **prudent macroeconomic policies, lower commodity prices, a resilient financial system, a sound corporate sector, a focus on quality of government spending**, and new opportunities from **global supply chain shifts**.

## GDP Growth

- The **real GDP growth** is **projected at 6.5% for 2023-24** with risks evenly balanced and is expected to expand at **7% in FY2023**.
- The real GDP growth will be on account of **softer global commodity and food prices, good rabi crop prospects**, sustained buoyancy in **contact-intensive services**, the government's continued thrust on **capital expenditure** (capex), higher capacity **utilisation in manufacturing**, double-digit



**credit growth**, receding drag on **purchasing power** from high inflation and rising **optimism among businesses** and consumers.

- **Slowing global growth, protracted geopolitical tensions** and a possible **upsurge in financial markets volatility** following new stress events in the global financial system could pose downside risks to growth.

### Contact-intensive services

These services involve a **high degree of physical proximity** or interaction **between service providers and customers**, such as **hospitality, tourism, travel, aviation, mobility, entertainment, personal care**, etc.

They are more **vulnerable to the adverse effects of the COVID-19 pandemic** and the associated lockdowns and social distancing measures, as they face lower demand, reduced revenues, and higher operational costs.

### Inflation

- The inflation trajectory is expected to move down over 2023-24, with **headline inflation edging down to 5.2% from the average level of 6.7%**, with a stable exchange rate and a normal monsoon (unless an **El Nino event** strikes gross adverse effects on Indian economy).
- **Consumer price-based inflation** eased to an **18-month low of 4.7%** in April 2023 from 5.7% in the previous month, remaining in the comfort zone of **2-6%** for two consecutive months.

### Disinflation

Disinflation is a **temporary slowing** of the pace of price rise/inflation and is used to describe instances when the **inflation rate** has reduced marginally over the short term. It is necessary to prevent the economy from overheating.

### Headline Inflation

It refers to the change in the value of all goods and products in the basket. It includes commodities such as **energy (oil and gas prices), food and beverages**. As the prices of fuel and food items fluctuate regularly and create **volatility in headline inflation, core inflation (headline inflation-fuel & food in basket)** is another indicator of inflation. Headline inflation is more relevant for developing economies than developed economies.

### Change in accommodative stance

- **Monetary policy** remains focused on the **withdrawal of accommodation** to ensure that inflation progressively aligns with the target while supporting growth.
- The cumulative **increase in policy repo rate by 250 bps** would steer the **disinflationary process**, along with supply-side measures to address transient **demand-supply mismatch** due to food and energy shocks.

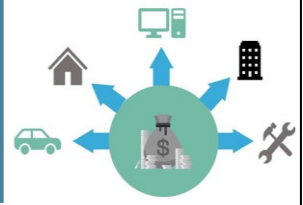
### Withdrawal of Accommodation

It means that the central bank is trying to **reduce the amount of money** available in the economy to control inflation. **Accommodative monetary policy** is used when the central bank expands the money supply to boost the economy by lowering interest rates and making borrowing cheaper.

## Capital Expenditure and External Sector

- In the Union Budget 2023-24, **capital expenditure has increased by 37.4%**, with the **railways** receiving the highest-ever capital outlay and the allocation of **interest-free loans to states for capital expenditure** has also increased.

**Capital Expenditure**  
The money that government spends on developing buildings, machinery, equipment, schools, and other infrastructure is known as capital expenditure.



- Crowding-in effects** of sustained increase in government capex are expected to spur **higher private investment** in the current fiscal.

### Crowding-in effects

Crowding in effect occurs when **higher government spending** leads to an **increase in private sector investment and growth**. Higher government spending leads to **economic growth** and encourages firms to invest because there are now more profitable investment opportunities.

### Current account deficit

A current account deficit indicates that a country is **importing more than it is exporting** and may occur when the country's expenditure on **imports is more** than its **income from exports** of goods and services. Emerging economies often run surpluses, and developed countries tend to run deficits.

- The **current account deficit (CAD)** is expected to remain **moderate**, drawing strength from **robust services exports** and the healthy impact of **moderation in commodity prices** of imports.
  - India's CAD was **2.7% of the GDP** in the December quarter of 2021-22.
- The favourable domestic growth outlook, lower inflation, and business-friendly policy reforms could help sustain **buoyant FDI inflows**, whereas **foreign portfolio investment (FPI)** flows may remain volatile.

### Resilient banking sector

- There is a need to reassess risks to the financial **stability** and **resilience** of financial institutions in the context of **monetary policy tightening**, due to recent **financial sector turmoil in the US and Europe**.
- Indian banks and non-banking financial institutions are in a strong and resilient position, but they should regularly assess and strengthen their **capital buffer and liquidity** to be prepared for any new shocks.

### Monetary Policy Tightening

- Monetary policy tightening, or **contractionary monetary policy**, is a strategy a central bank uses to reduce the money supply and increase the interest rates in an economy, to slow down economic growth and control inflation.

### Central Bank Digital Currency (CBDC)

- The RBI aims to expand the ongoing pilots in **CBDC-Retail and CBDC-Wholesale** by incorporating various use cases and features, in the current fiscal.

### CBDC-Retail and CBDC-wholesale

CBDC is a digital form of money issued by a central bank. It is different from cryptocurrencies, which are **not backed by any authority**, and from private digital currencies, which are **issued by non-bank entities**. **Retail CBDCs (e₹-R)** are available for the **general public** to use for everyday transactions, such as buying goods and services or transferring money to others. **Wholesale CBDCs (e₹-W)** are restricted to a **limited circle of financial institutions**, such as banks and clearing houses, to use for

interbank transactions, such as settling securities or making cross-border payments. The (e₹-R) is a digital token representing legal tender and can be transacted through a digital wallet offered by the participating banks.

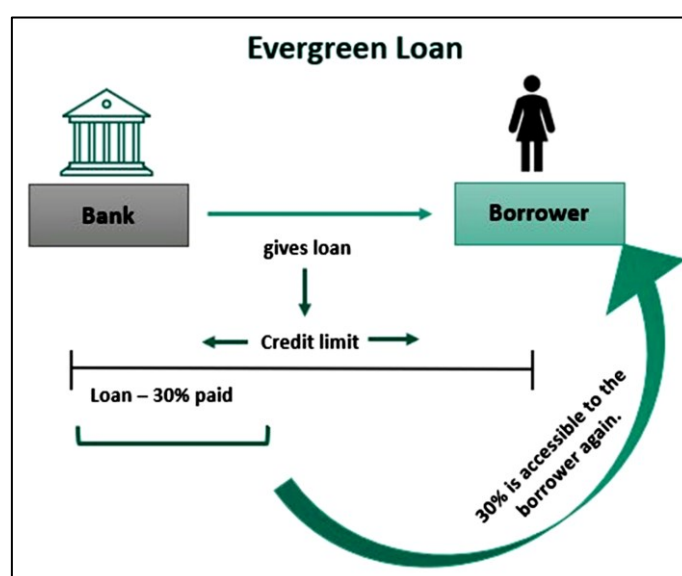
### Risks associated with India's growth scenario:

- Global finance market volatility (banking crisis, recession, etc.)
- Slow global growth and demand
- Protracted geopolitical tensions and fragmented geo-economics
- Adverse impact of El-Nino on Indian monsoon and climate change
- Disruption in technology, cyberthreats, terrorism, etc.

## EVERGREENING OF LOANS

**In News:** Reserve Bank of India (RBI) Governor raised red flags over banks adopting innovative methods for evergreening of loans – covering up the real status of stressed loans of corporates to project an artificial clean image of their financial standing.

- The RBI Governor mentioned that these innovative methods used for evergreen of loans are:
  - Bringing two lenders together to evergreen each other's loans by **sale and buyback of loans** or debt instruments.
  - Good borrowers are persuaded to enter into **structured deals with a stressed borrower** to conceal the stress.
  - Use of **internal or office accounts** to adjust borrower's repayment obligations.
  - Renewal of loans or disbursement of **new/additional loans** to the stressed borrower or related entities closer to the repayment date of the earlier loans.



### What is the evergreening of loans?

- An evergreen loan is also known as **revolving credit**, where borrower can **repay or retake the loan numerous times** during the agreement's sustainability.
- It refers to the practice of banks **providing additional loans** to borrowers who are **struggling to repay** their existing loans, to cover the repayment of their old loan.
- This approach is practised by banks **to avoid classifying the original loan as a non-performing asset** or bad debt on their financial statements.
- Banks **delay the recognition of losses** due to loan defaults and engage in evergreening so that bad loans are made to look good many a time by additional lending to troubled borrowers.

- The market most commonly used evergreen loans are credit cards and lines of credit, including overdraft limit, export packing credit, etc.
- The process of evergreening of loans is a form of **zombie lending** and is a **temporary fix** for a bank.
- Evergreening of loan could lead to problems of **twin balance sheet**.

### When and why do banks evergreen loans?

- Between 2000 and 2014, corporations were allowed to opt for lenient restructuring methods, indirectly leading many companies to use fresh loans from banks to conceal the true state of their loan portfolios.
- Though **an accommodating monetary policy** intends to keep interest rates low in order to infuse **more cash** into the economy to **boost growth and reduce unemployment**, it also creates a favourable environment for weak banks to evergreen loans, keeping financially struggling borrowers afloat.
- Evergreening has predominantly taken place in **public sector banks**, resulting in a **surge in non-performing assets** (NPAs).

**Zombie Lending:** It is the extension of new credit or prolonging of existing loans to low-productivity firms.

**Twin balance sheet problem:** It refers to the **stress on balance sheets of banks** due to non-performing assets (NPAs) or bad loans on one hand, and **heavily indebted corporates** on the other.

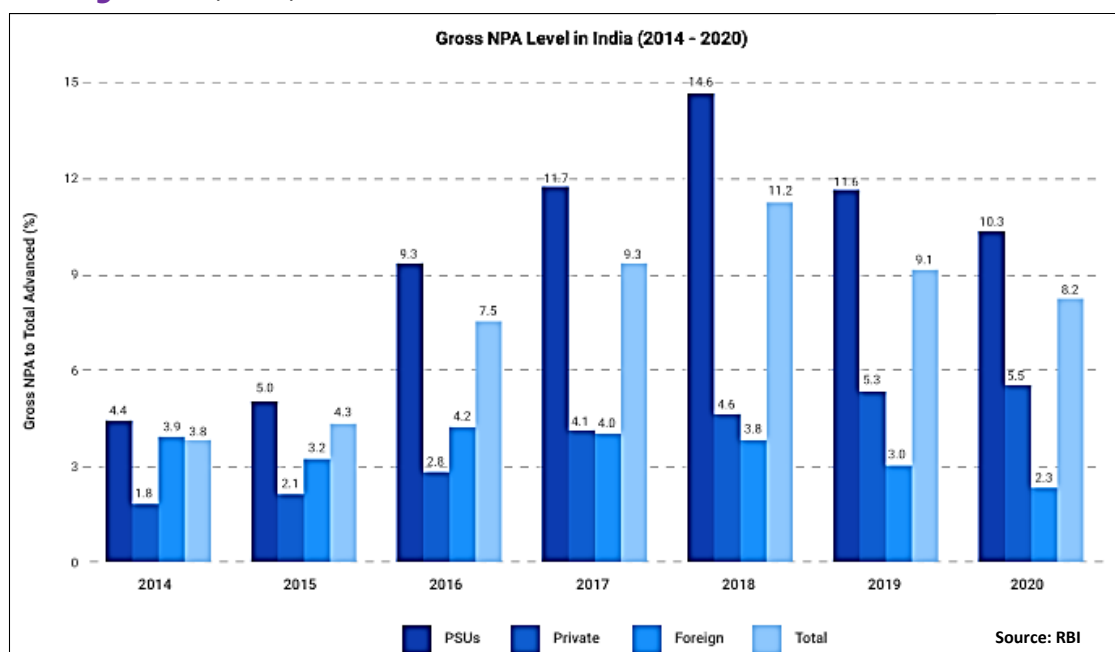
- **Balance sheet:** It is a financial statement that contains details of a **company's assets or liabilities** at a specific point in time.

### Non-Performing Asset

It is a loan or credit where the borrower has **failed to make scheduled payments** for a certain period, typically **90 days** or more.

Classified into three categories:

- **Sub-standard assets:** less than or equal to **12 months**
- **Doubtful assets:** **Exceeding 12 months**
- **Loss Assets:** **Uncollectible**, no hope of recovery and needs to be fully written off.





### Accommodative monetary policy/Lose credit/Easy monetary policy

- Accommodative monetary policy is when central banks **expand the money supply** to boost the economy.
- Monetary policies that are considered accommodative include **lowering the central bank interest rate**.
- These measures are meant to **make money less expensive** to borrow and **encourage more spending**.

#### Why it is a concern?

- Evergreening loans allow banks to **conceal the true level of financial strain** on their records and over time, these stressed loans can escalate into a **crisis**.
- It can **undermine credit discipline and moral hazard among borrowers**, while also eroding the trust and **confidence of depositors, investors, and regulators**.
- During evergreening, weak firms borrow through weak banks, and indirectly decrease real investment, thus **crowding-out the genuine credit needs** of good borrowers.
- In present times, where the **US and European banks are failing** due to global uncertainty, the practice of Indian banks indulging in evergreening of loans could be detrimental to India's economy.

#### Methods to stop evergreening of loans?

- Implementation of strong **risk assessment procedures** and **asset quality review** to effectively evaluate the creditworthiness of borrowers and their own lending potential.
- **Levying penalties** through cancellations of unvested stock options.
- **The senior management** of the institution, including the CEO, audit committee and board members to be held accountable for **resource misallocation**.

#### Loan write-offs

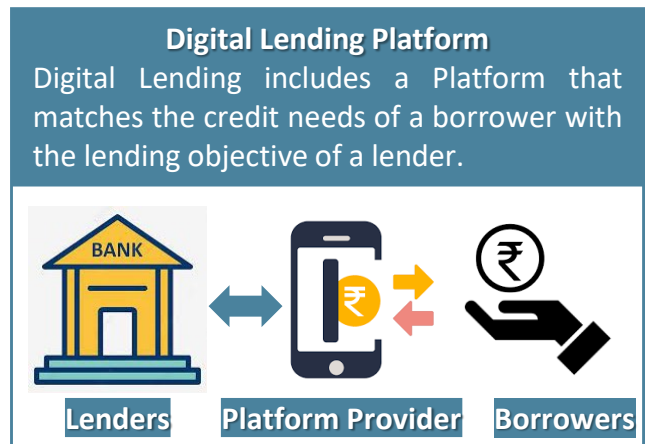
- It is the process of **removing non-performing loans** (NPLs) from a bank's records after setting aside sufficient provisions for them.
- When banks write off loans, they remove them from their **NPA books**, providing a more accurate representation of their actual financial status.
- In the last 5 years, a **mega write-off exercise** has enabled banks to reduce their non-performing assets, or defaulted loans, by **Rs 10 Lakh crore** (\$123.86 billion).
- Aided by this huge write-off, the banking sector reported a decline in gross NPAs from **11.2% in 2017-18** to **less than 5%** (5.5 Lakh crore) in March 2023.
- Approx 3/4<sup>th</sup> of these loan write-offs were by public sector banks.

### DEFAULT LOSS GUARANTEE (DLG)

**In News:** The Reserve Bank of India (RBI) came out with a regulatory framework **to permit default loss guarantee** arrangements in **digital lending**.

- The RBI has clarified and **approved the operation of fintech companies** as **Lending Service Providers** (LSP)/intermediaries in digital lending process with certain caveats.

- A **Regulated Entity** (RE) like a bank or NBFC can only enter into DLG arrangements with an LSP or another RE if it has entered into an **outsourcing arrangement**.
- LSP providing DLG must be incorporated under the **Companies Act, 2013**.
- Total amount of DLG cover on any outstanding portfolio shall **not exceed 5%** of the amount of that loan portfolio.
- Banks can accept DLG in digital lending only if the guarantee is in the form of a **cash deposit, fixed deposits** in a bank with a lien in favour of the **Regulated Entity** (RE), or a **bank guarantee** in favour of the RE.
- RE will invoke a default loss guarantee within a maximum overdue period of **120 days**.
- The **period for which the DLG agreement** will remain in force shall not be less than the **longest tenor of the loan** in the underlying loan portfolio.



### What is DLG?

- It is an arrangement whereby a third party such as a **financial technology (fintech) player/Lending Service Provider** (LSP) **compensates lenders** if the borrower **defaults**.
- LSP provides certain credit enhancement features such as a first loss guarantee up to a **pre-decided percentage of loans** generated by it, and **credit risk is borne by the LSP** without having to maintain any regulatory capital.

### Lending service providers (LSP)


- Lending service providers are new-age players who use **technology platforms** in the lending space.
- They are agents of a bank or NBFC who **carry out one or more of a lender's functions** (in part or full) in **customer acquisition, underwriting support, pricing support, disbursement, servicing, monitoring, recovery** of specific loan or loan portfolio on behalf of REs as per the outsourcing guidelines of the RBI.

### Challenges with Unregulated Fintech as Intermediary

- **Prepaid Payment Instruments:** RBI only allowed licensed banks to issue credit cards, so to circumvent this fintech used **Prepaid Payment Instruments** (PPI) by collaborating with banks to issue cards bearing their own logo and then partner with an NBFC to incorporate credit-like features.
- **Pooled lending:** Fintech formed multiple partnerships with NBFCs to fulfil their lending requirements. They consolidated funds from these partnerships into a pooled account and provided loans to customers from that account, which helped them earn a **float or an interest** on all the money lying in the pool account.


- **Default guarantee:** Some fintech even offered guarantee defaults up to **20%-100%**, when they handed customers to banks or NBFCs.
- **Systemic risk:** The system was at the **operational and contagion risk** in case of **bankruptcy of fintech companies, reckless loans, off-balance sheet loan portfolio**, etc.
- Previously, the RBI had guided against **3<sup>rd</sup> party collection of loan recovery, withholding money by LSPs as fees, automatic increase of credit limit for customers and asked for provisioning of grievance redressal officer** with the LSPs.

### Fintechs seek regulatory clarity from RBI



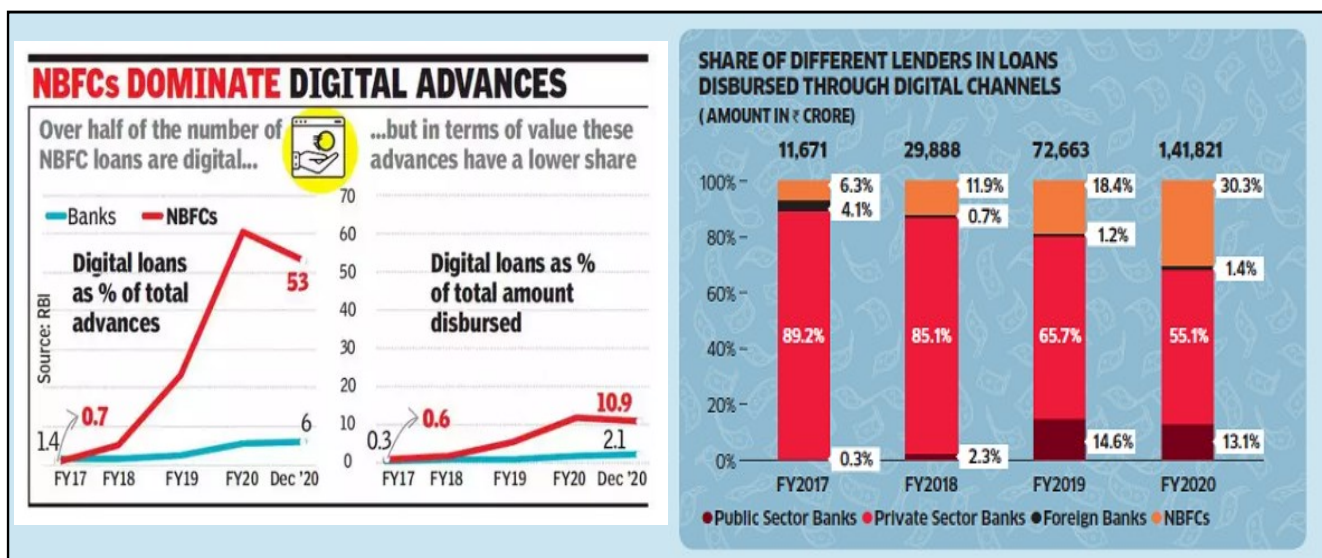
**WHAT DO FINTECHS WANT?**

- Detailed framework** for first loss default guarantee (FLDG) models
- Clarity on** whether unregulated entities can be part of credit risk-sharing arrangements
- Rules or** guidelines for loan service providers or unregulated fintechs to operate
- Reduce latency** on credit bureau reporting



**WHY?**

- Lack of** FLDG models has been affecting attractiveness of new-age fintech NBFCs
- Fintechs believe** they have better knowledge of risk on certain credit segments
- Fintechs don't** want to operate under uncertainty of future guidelines disrupting business models
- To safeguard** the industry from credit risks



### The Middle Path

- By **regulating the over-the-top fintechs** and allowing them to operate as LSPs, RBI has chosen to **balance** between **innovation in finance market and product risk management**.
- The regulations will provide for an ecosystem of **shared risk assessment** (underwriting) between the REs and LSPs, better **outreach for customer acquisition** and **loan portfolio management**.
- Increase in **digital lending post covid fiasco and growth of e-commerce market** has attributed for the emergence of this innovative model of business.
- The emergence of strong underwriting platforms will lead to **lower lending rates** and **encourage healthy competition** and drive further improvements in the lending sector.

## SEBI DISCLOSURE FOR HIGH-RISK FPIs

**In News:** The Securities and Exchange Board of India (Sebi) has **proposed stricter disclosure norms** for certain foreign portfolio investors (FPIs) to bring in more **transparency and trust** against the backdrop of the **Adani-Hindenburg Research saga**.

- The move comes after four Mauritius-based FPIs were found to have invested almost all of their capital in Adani Group stocks and **manipulated the prices** of Adani stocks. SEBI was unable to zero in on the ultimate **natural person beneficiary owners** of large investments in Adani group companies.
- The two broad issues that prompted the floating of the proposed regulation in the consultation paper are potential misuse of the **FPI route** for **circumventing Press Note 3** stipulations and concentrated group investments by foreign portfolio investors endeavouring to bypass regulatory requirements of **Minimum Public Shareholding (MPS)**.

### Objective of SEBI's regulation

- The objective is to **“enhance trust** in the Indian securities markets by mandating **additional granular disclosures** around ownership of, an economic interest in, and control of objectively identified high-risk FPIs.
- **Requirements of MPS:** the SEBI paper suggests **categorizing FPIs into high, moderate, and low risk**.
- Regarding **Press Note 3:** It may happen that a FPI entity is located in a country with which India does not share a **land border**, but the investor in the FPI (or the beneficial owner of the FPI) might be a **citizen and/or residing** in such a country. The proposed regulations in both cases would be able to trace such ownership and economic interest, courtesy of the additional disclosures.

Entity	Risk Category
Government, central bank and sovereign wealth funds	Low Risk
Pension and public retail funds	Moderate Risk
Remaining FPIs	High Risk

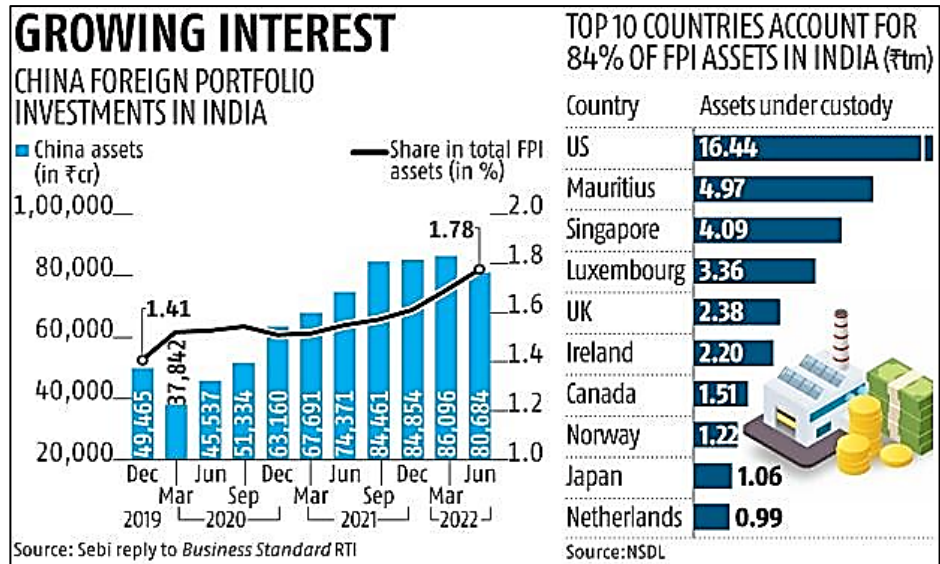
Basis of Difference	FDI	FPI
Definition	Foreign Direct Investment (FDI) refers to either direct investments made in a foreign country to expand a firm, build new infrastructure, or make long-term investments in that country's economy.	Foreign Portfolio Investment (FPI) is an investment in a foreign country's financial assets, either stocks or bonds. It is mainly done to generate significant returns from the stock markets.
Type of Investors	Active	Passive
Type of Investment	Direct Investment	Indirect Investment
Degree of Control	High control	Very low control
Investment Term	Long Term	Short Term
Involvement	Long term interest in the company, therefore, involved in management and ownership control.	Looking for short term gains, therefore no active involvement in the managerial activities.
Project Management	Projects are managed efficiently.	Less efficiency in project management.
Type of Assets	Physical assets and stakes in the foreign companies. (Financial and Non-Financial Assets).	Financial assets of the foreign country like stocks, bonds, and ETFs.
Entry and Exit	Difficult	Relatively easy
Motive	Business expansion.	Generating returns to the investor.
Leads to	Transfer of technology, funds, and resources to the foreign country.	Capital inflow to the foreign countries.
Volatility	Stable	Volatile

### Minimum Public Shareholding

This rule requires that promoters **should not hold stakes worth 75% or more** in a listed company. However, there are some exceptions to this rule for recently listed companies.

## SEBI Proposal

- SEBI has proposed that enhanced transparency measures for **fully identifying all holders of ownership, economic, and control rights** may be mandated for certain **high-risk FPIs**, to **mitigate the risk of circumvention** of regulations such as MPS.
- Regulator has proposed that high-risk FPIs, holding **more than 50% of their equity under Asset Under Management (AUM)** in a single corporate group, would be required to comply with the requirements for additional disclosures.
- The existing high-risk FPIs with an **overall holding in Indian equity markets of over Rs 25,000 crore** will also be required to comply with new disclosure requirements, failing which the FPI will have to bring down its AUM below the threshold within a time frame.



### Press Note 3 and Its Misuse

- In essence, Press Note 3 provides that an entity of a country, which **shares a land border with India** (the 'Bordering Countries') or where the beneficial owner of an investment into India is situated in or is a **citizen of any such Bordering Country**, can invest (whether by subscription of shares in a primary issuance or by the acquisition of shares in a secondary sale) **only with the prior approval of the GoI**.
- Press Note 3 is not applicable to FPI investments**, however, the FPI route could **potentially be misused to circumvent** the stipulations of Press Note 3. There is a need to identify investors in high-risk FPIs with large equity portfolios at a granular level, whose investors may be based out of land bordering countries. In certain instances, it has been observed that while the high-risk FPI itself may be situated out of a non-land bordering country, the **investors** in such high-risk FPIs may be **based out of the land-bordering countries**. The proposed additional requirements are for high-risk FPIs and will not impact low-risk and moderate-risk FPIs in any manner.

### How FPIs circumvent MPS regulations?

- FPIs are concentrating a substantial portion of their equity portfolio in a single investee company and in some cases, these concentrated holdings have also been **maintained near static for a long time**.
- Concentrated investments through the FPI route could allow promoters or investors to **roundtrip their money and circumvent regulatory requirements**, such as maintaining minimum public shareholding. This raises concerns about the **accuracy of suggested/mandated free float** or the shares available in the open market for public trading without restrictions, increasing the **risk of price manipulation** in those securities.

## Impact of proposed SEBI regulations

- Critics argue that FPI categorization and **granular disclosures** would make India's FPI regime **one of the strictest in the world**.
- Advocates of such transparency norms suggest that **trust and transparency** is essential for **long term capital formation and stability** of economic system.
- The capital markets regulator said the proposed additional requirements are for high-risk FPIs (estimated at **6% of total approx. \$600 billion FPIs** in listed firms) and **will not impact low-risk and moderate-risk FPIs** in any manner.

### SEBI (Securities and Exchange Board of India)

It is the **regulatory body for securities and commodity markets** in India. It possesses both **quasi-legislative and quasi-judicial powers**, allowing it to formulate **regulations, conduct inquiries, make rulings, and impose penalties** on offenders. The **Securities Appellate Tribunal (SAT)**, with powers equivalent to those of a civil court, has been established to safeguard the interests of entities dissatisfied with SEBI's rulings, and any individual who remains unsatisfied with SAT's decision or order can further appeal to the Supreme Court. SEBI is **headquartered in Mumbai** and operates under the **Ministry of Finance**. Established in 1988, it became a **statutory body in 1992** with the passing of the SEBI Act, 1992.

## RBI AS NET SELLER OF DOLLARS

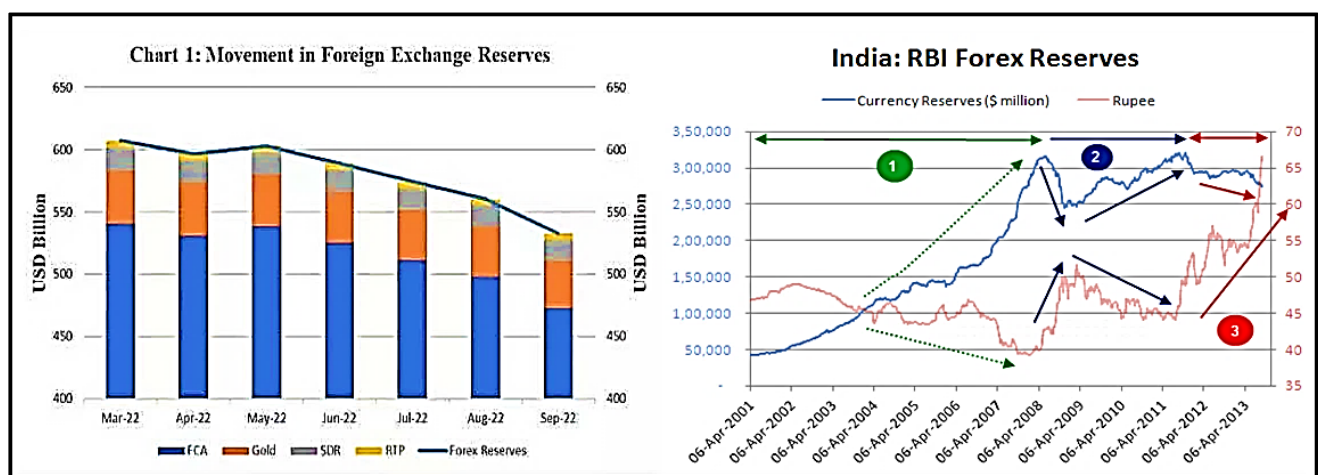
**In News:** Having **sold \$25.516 billion** on a net basis in the spot foreign exchange market, the Reserve Bank of India (RBI) became a **net seller of the US dollar in FY2023**.

- Financial markets worldwide are facing intense selling pressures on extreme risk aversion due to the **hawkish USA FOMC guidance** and rate hike trajectory compounded by its **Quantitative Tightening posture**.
- **Flight to safety** has led to a spike in volatility across all asset classes, with several emerging market currencies experiencing downside pressures.

### RBI'S FOREX INTERVENTION

Net purchase (+)/  
sale (-) of dollars

FY23	-\$25.52 billion
FY22	+\$17.312 billion
FY21	+\$68.315 billion
FY20	+\$45.097 billion
FY19	-\$15.377 billion



## Spot foreign exchange market

- The spot foreign exchange market is the market where **financial instruments**, such as **commodities, currencies, and securities**, are traded for immediate delivery. Delivery is the **exchange of cash for financial instruments**.
- The spot market is also called the **cash market or the physical market**. The spot price is the current market price for exchanging one currency for another.
- It is the **largest and most liquid market in the world**, with trillions of dollars changing hands daily.

## Federal Open Market Committee (FOMC)

- It is the policy-making body of the US Federal Reserve, about its **current and future monetary policy actions** and expectations.
- The FOMC guidance can influence the market expectations and reactions to the Fed's policy decisions, such as **interest rate changes, asset purchases, or balance sheet adjustments**.
- It can be **hawkish or dovish**, meaning that it signals a **tighter or looser monetary policy** stance, respectively.

## Quantitative Tightening Posture

- It is the process of reducing the size of the **Fed's balance sheet**, which consists of various assets such as **US Treasury securities and mortgage-backed securities (MBS)** that the Fed bought during and after the global financial crisis to provide **liquidity and stimulus to the economy**.
- It involves selling or not reinvesting these assets, which **reduces the amount of money in circulation** and **increases the interest rates**. It is the opposite of **quantitative easing posture**, which is the process of expanding the Fed's balance sheet by buying more assets.

## Flight to safety

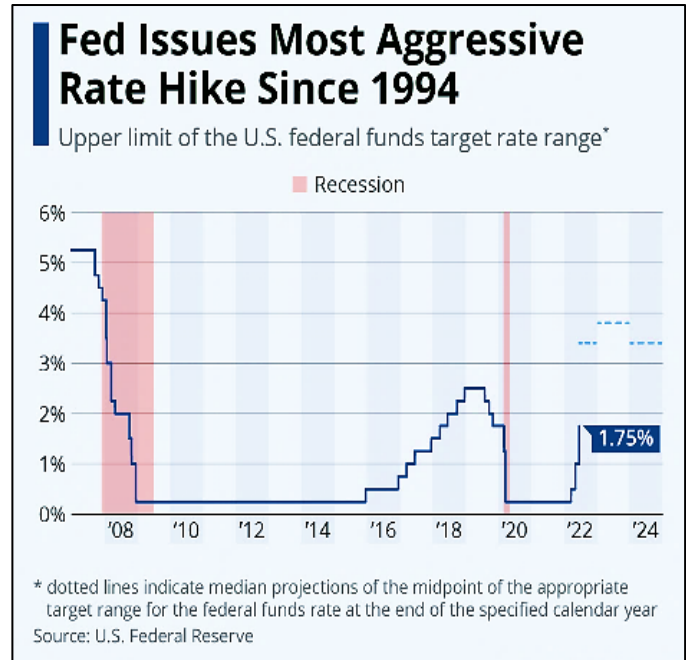
- It is a phenomenon where investors move their funds from **riskier assets** such as **stocks, commodities, or emerging market currencies** to **safer assets** such as **US dollars, US Treasury bonds, gold, or Japanese yen** during times of **uncertainty, volatility, or crisis in the financial markets**.
- It can cause a decline in the prices and returns of riskier assets and an increase in the prices and returns of safer assets.
- It can also **affect the exchange rates** of different currencies, as investors demand more of the **safe-haven currencies** and less of the riskier currencies.

## Why RBI become a net seller of US dollars?

- The RBI has to consider financial market conditions, impact of **imported inflation** and the acute **shortage of US dollars** in the market and accordingly decide to sell US dollars to **keep the Indian Rupee from depreciating sharply**.
- The selling action was conducted against the depreciation of Indian Rupee **by 8% to 82 per dollar** in fiscal year 2023 from 76 per dollar in fiscal year 2022.

- During the previous fiscal, the rupee was depreciating primarily on the **widening of the current account as oil prices rose due to the Ukraine war** and the strengthening of the dollar against other currencies.
- The rupee also declined as **foreign investors** pulled out money from the domestic market after the **US Federal Reserve raised interest rates to check inflation**.

Had the RBI not sold dollars (in FY23), the rupee **would have weakened** to 84-85 levels against the dollar.



**Depreciation:** It is a measure of the decrease in the market value of an asset over time from influential economic factors.

### How can the RBI sell?

- **USD sell/buy swaps:** In order to provide liquidity to the foreign exchange market, swaps are conducted through the auction route in multiple tranches. These are a type of **foreign exchange swap transaction** where a party **sells US dollars to another party** and agrees to buy back the same amount of US dollars at a later date at a **predetermined premium**.
- **Spot and Forward markets:** The central bank can sell in the spot and forward market at the same time to avert pressure on the INR. Such intervention is used to shield the rupee from **excessive volatility**.

### Impact

- The country's **foreign exchange reserves decreased** due to valuation changes arising from an **appreciating US dollar**.
- RBI intervention in the foreign exchange market is aimed at **stabilizing the rupee movement**.
- Sale or purchase of dollars by the RBI has a **bearing on its profit**. The sale of dollars helped the RBI book profit which is reflected in **higher dividend payout (Rs 87,416 crore as surplus)** to the government in FY2023.

### Other ways to curb the Depreciation of Rupee:

- Allowing more **foreign investment in government bonds, corporate bonds, and equity markets** to increase the supply and demand of rupees.
- **Reducing the import of non-essential goods** and **promoting the export of goods and services** to narrow the trade deficit and current account deficit.
- Improving the macroeconomic fundamentals such as fiscal deficit, inflation, growth, and governance to enhance the confidence and credibility of the economy.



## SNOWBALL EFFECT AND INDIA'S ECONOMIC GROWTH

**In News:** During a recent visit to India, the President of the **World Economic Forum, Borge Brende** commented that India is projected to achieve the **highest economic growth** among major global economies this year.

### Important observations by WEF President

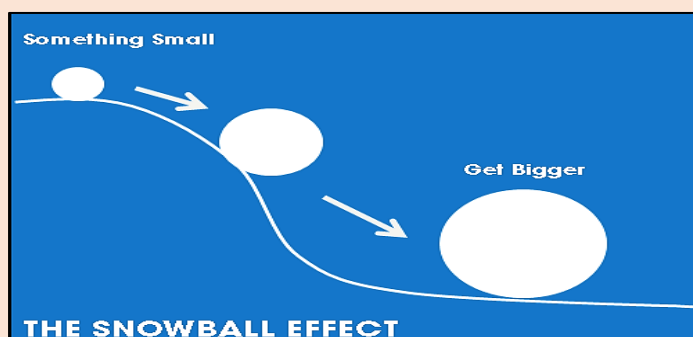
- As the fastest growing G-20 economy witnessing the “**snowball effect**”, India is expected to have benefits through **investment growth, job creation** and **poverty reduction**.
- Overcoming **bureaucratic red tapeism**, strengthening democracy and a culture of entrepreneurship and innovation will lead India to inspire other nations, further enhancing India's global image and soft power.

### World Economic Forum (WEF)

- It brings together **individuals, NGOs, political and business leaders** each year to discuss significant issues that impact the **global economy**. These include but are not limited to **political, economic, social, and environmental concerns**.
- The WEF is the international non-profit organization for **Public-Private Cooperation**.

### Snowball effect

When a **small cause leads to a larger outcome** through **cause-effect relationship**, a snowball effect is produced. Literally seen, it is like a small **snowball rolling downhill** and gradually gaining **mass and momentum**, resulting in a larger and faster moving object. The snowball effect describes the current situation of **the Indian Economy**. The Indian economy is witnessing a **positive trend of growth and expansion**, with the potential to gather pace and achieve even greater success in future.



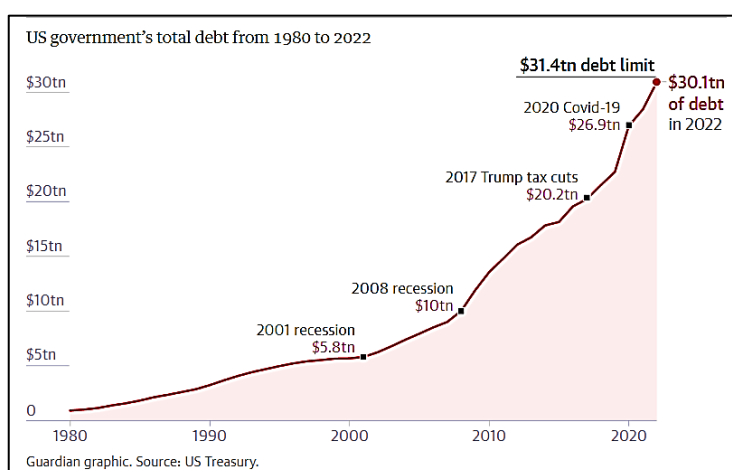
## US DEBT CEILING

**In News:** The US government could default on its borrowings, an **unprecedented situation** that could potentially hit economies worldwide, if Congress doesn't raise the nation's debt ceiling.

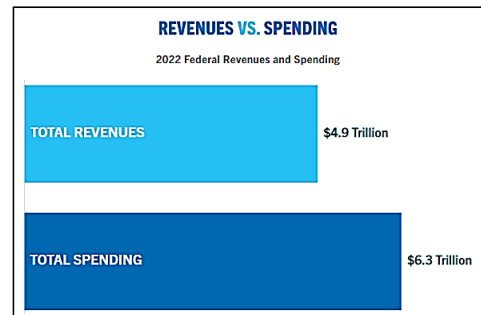
- The approximate amount of the current U.S. debt ceiling, as set by a congressional vote is \$ 31.4 trillion.

### What is the US debt ceiling?

- The debt ceiling, or debt limit, is the total amount the US government is allowed to borrow to **finance its expenditure**, such as **paying salaries and welfare allowances**.



- The debt ceiling allows the government to **borrow money within the approved limit set by Congress**, giving the executive branch the ability to spend without constant Congressional approval.
- The debt limit was **introduced in 1917**, when the US entered World War I, before that Congress had free rein over the country's finances.



### What happens if the government defaults?

- The government would no longer be able to pay the salaries of federal and military employees, while **social security cheques** payments that millions of pensioners in the US rely on - would stop.
- **Investors would lose faith** in the US dollar, which could lead to a rapid economic decline. This could result in job losses, reduced government services, and a potential increase in mortgage rates, negatively impacting the housing market.
- This **weakening of official dollar purchases** would likely increase volatility in the dollar's value against other currencies and decrease liquidity, prompting investors to reduce their holdings of dollars in any form.

### Why does the government take Debt?

Each year, the government takes in revenue from taxes and other streams, such as customs duties, but ultimately **spends more** than it takes in, which results in **deficit** to the government. To borrow money, the US treasury issues securities, like **US government bonds**, that it will **eventually pay back with interest**. Once the US government hits its debt limit, the treasury department cannot issue more securities, essentially stopping a key flow of money into the federal government.

### Why US debt is so high?

- US debt started to grow in the 1980s, after Ronald Reagan's **huge tax cuts**, without much tax revenue the government needed to borrow more money to spend.
- In 1990s, after the end of the cold war, government **cut back on defence spending** which generated higher tax revenues but in the early 2000s, the burst of the dotcom bubble triggered a recession.
- George W. Bush implemented two **tax cuts** in 2001 and 2003, and the **US military campaigns** in Iraq and Afghanistan resulted in a substantial increase in spending, nearly \$6 trillion throughout the war.
- In **2008 Great Recession**, the government had to bulk up spending to bail out banks and increase social services as the unemployment rate hit 10%.

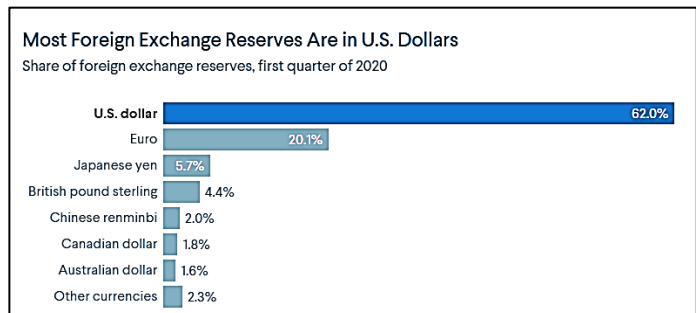
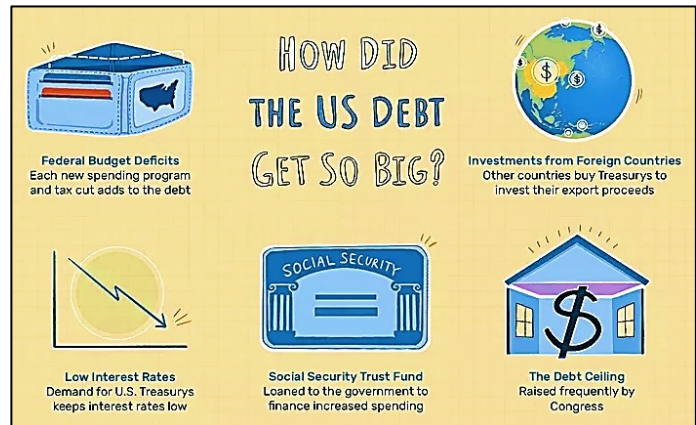
Category	FY 2022 spending
Social Security	\$1.22tn
Health	914bn
Income security	865bn
National defense	767bn
Medicare	755bn
Education, labor, and social services	677bn
Net interest	475bn
Veterans benefits and services	274bn
Transportation	132bn
General government	129bn

Guardian graphic. Source: US Treasury.

- In **Covid-19 pandemic** hit the US government passed a series of stimulus bills of \$5tn to offset the worst of the pandemic's impacts.

### Impact on Global Economy and India

- US is a **significant trading partner** for India. A default by the US could result in reduced imports from India and potentially affect service industries, leading to job losses.
- **Investments** from the US into India may be impacted by a US default, there may be high volatility in domestic currency markets, and the equity markets may face increased stress.
- US default could significantly impact **India's forex reserves**, causing sharp fluctuations in the currency market.



- US debt, long viewed as an **ultra-safe asset**, is a foundation of global commerce, built on decades of trust in the United States. A default could shatter the \$24 trillion market for **Treasury debt**, cause financial markets to freeze up and ignite an international crisis.
- A more serious default would cause a **sharp decline in the US dollar**, causing chaotic fluctuations in exchange rates, and spiking the prices of oil and other commodities.
- **Global inflation** may well rise again and supply chain issues, which dampened trade following the COVID-19 pandemic, could worsen due to the lack of trust within the financial system.
- Defaulting on the country's debt could be enough to convince third-party nations that the **United States isn't trustworthy** and that their economies would be better served by investing in Moscow and Beijing.

## MEDICAL DEVICE SECTOR

**In News:** Centre under a new initiative '**Assistance to Medical Device Clusters for Common Facilities' Scheme** issued guidelines by the **Department of Pharmaceutical** to bolster the **medical devices sector** with infra push, against the backdrop of recently launched **National Medical Device (NMD) Policy 2023**.

### Context to the NMD Policy:

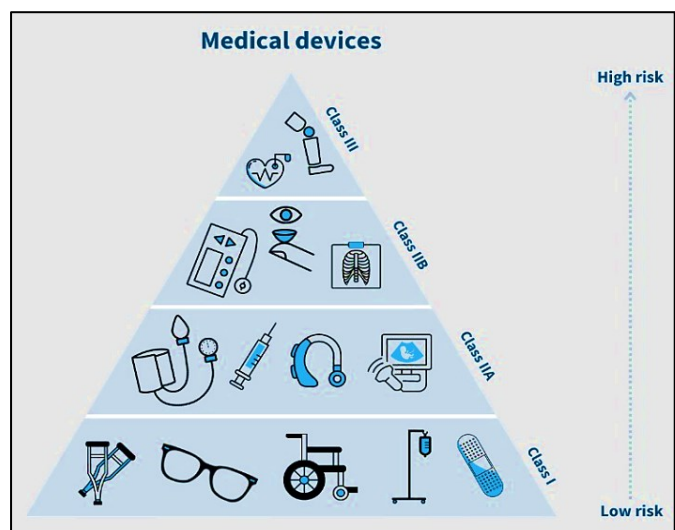
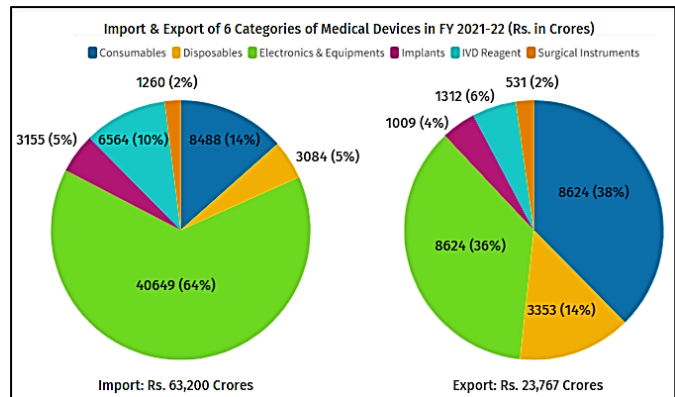
- Indian medical device industry is **currently the 4th largest Asian medical devices market** after Japan, China, and South Korea.
- **80%** of the medical devices used in the country are imported.
- India's domestic industry accounts for **just 1.6%** of the global medical device **trade**.
- According to the Commerce ministry data, **medical device imports** rose by a record **41%** in FY22 over a year.
- The value of medical equipment imports into India in 2021–22 increased from Rs. **4,569 crores (US\$ 572.07 million)** in 2016–17 to **Rs. 63,200 crores (US\$ 7.91 billion)** in 2021–22.

## Future Potential of Sunrise Medical Devices Sector:

- Estimated at **\$11 billion (2020)**, India's medical device industry has the potential to reach **\$50 billion by 2030**.
- Exports of medical devices stood at \$2.90 billion in FY 2022; this is estimated to scale to **\$10 billion by FY 2025**.
- The government plans to increase the share of medical devices market to **10-12%** of the global market in the coming **25 years**.

### NMD Policy, 2023

- It plans the establishment of additional **quality testing labs** and shared infrastructure facilities for mandatory **testing and certification** of all medical devices.
- The policy would enable **monitoring of prices** and curbing of **artificially inflated MRP** practices.
- The department has outlined a need for **improved regulatory compliance** and a boost in the **availability of skilled personnel**.
- The policy creates a **single window clearance** system for **licensing** of medical devices.
- It has provisions of **financial aid** to manufacturers, underpinning the gov't's commitment to bolstering the critical pharma industry.
- The policy seeks to establish and strengthen **large medical device parks and clusters** with quality infrastructure facilities (**plug and play infrastructure**) close to economic zones with requisite logistics connectivity.
- The policy envisages the creation of a dedicated **Export Promotion Council** for the sector under the Department of Pharmaceuticals.



### Objectives of NMD Policy 2023

- **Promote indigenous manufacturing, build competitiveness, and develop an ecosystem for manufacturing.**
- Ensure access to **innovative, affordable, and quality healthcare products**
- Support Indian medical devices sector to **manufacture and export with safety and quality.**
- Establish and strengthen **common infrastructure, testing labs and foster innovation** and R&D.

**Medical devices** are products which are used to diagnose, prevent, relieve, or treat a disease, disability, injury, etc. There are more than 500,000 different types of medical devices available, covering anything from wheelchairs and glasses to pacemakers, mobile phone apps, implants and state-of-the-art surgical equipment.

### Issues around the Medical Devices Sector:

- The **target of incremental sale of medical devices** required to gain advantage of **Production Linked-Incentive (PLI scheme)** is practically impossible for the micro, medium level medical manufacturing industry of India.
- Indian manufacturing companies face a **manufacturing bias of 10-12%** in terms of **lack of RnD, affordable finance and presence of basic infrastructure**.
- The **reduced custom duty for imports and GST input credit** available for medical devices import renders it far more competitive than domestically manufactured medical devices.
- There is a **bias of purchase** for imported products owing to their standards and quality of production and maintenance.
- The PLI scheme covers equipment related to implants and imported products for cancer care, radiology, imaging, nuclear imaging, anaesthetics, cardio respiratory, and renal care.

### Need of the Hour for Development of Medical Devices Industry:

- Promote **MSME manufacturing** (80% of Indian manufacturers) in India in the lines of **PLI in electronics**.
- Protect Indian manufacturers by imposing **higher custom duty**, similar to the **BRICS nations**.
- **Utilize 100% FDI** in medical sector to establish global manufacturing centers in India.

### Conclusion:

India's growing **middle class population, increasing life expectancy, awareness towards medical health, growing insurance business, home healthcare, tele-medicine, competitive pricing and medical tourism** lead the way to prove that medical devices sector is a **sunrise** industry in India.

## LARGEST GRAIN STORAGE PLAN

**In News:** Cabinet approves **Inter-Ministerial Committee** to facilitate the **"World's Largest Grain Storage Plan in Cooperative Sector"**.

- Under the new plan, the **Ministry of Cooperation** aims to set up a network of **integrated grain storage facilities (70 MMT)** through **Primary Agricultural Credit Societies (PACS)** across the country.
- The **multi-pronged plan** aims to **establish godowns as procurement centres, serve as Fair Price Shops (FPS), operate Custom Hiring Centers (CHC) and common food processing units**.
- The plan converges efforts of **4 ministries**, viz. Ministry of Cooperation, Ministry of Agriculture and Farmers Welfare, Ministry of Consumer Affairs, Food and Public Distribution and Ministry of Food Processing Industries.
- The plan does not have a separate allocation of funds and will be implemented by the convergence of 8 schemes, like **Agriculture Infrastructure Fund (AIF), Agricultural Marketing Infrastructure Scheme (AMI), Mission for Integrated Development of Horticulture (MIDH), Sub Mission on Agricultural Mechanisation (SMAM)** from Ministry of Agriculture and **Pradhan Mantri Formalisation of Micro Food Processing Enterprises Scheme (PMFME), Pradhan Mantri Kisan Sampada Yojana (PMKSY)** from the Ministry of Food Processing.



- **Public distribution's allocation** of food grains under the National Food Security Act (NFSA), 2013 and **procurement operations** at Minimum Support Price (MPS) will also be part of the convergence plan.

### Need for the Grain Storage Plan

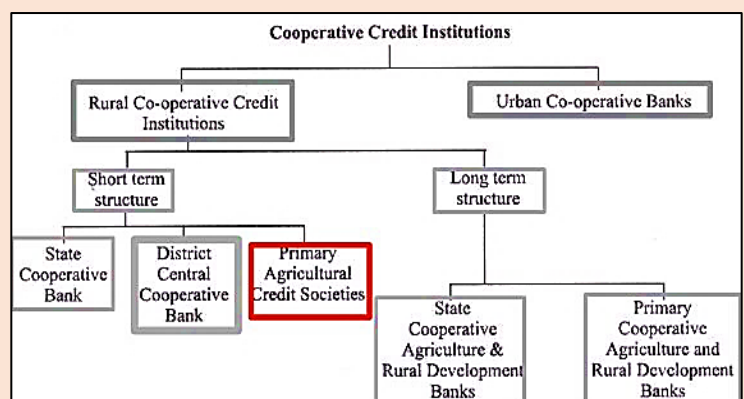
- India, as the **most populous country** (18% population) of the world accounts for only 11% of the **arable land** in the world. Covering 81 crore people under the **World's largest food programme** under NFSA, 2013, needs a robust network of foodgrain storage facilities.
- At present, India has a foodgrain storage capacity of **145 million metric tonnes (MMT)** against the **total food production of 311 MMT**, thus leaving a **gap of 166 MMT**.
- With a **storage capacity of 47%** of its total foodgrains production, foodgrains are sometimes stored in the open, which results in **damage**.
- The average post-harvest losses range between 10-16% for major cereal crops, 26% in the case of wheat and 34% in the case of fruits and vegetables.
- India has the storage capacity for only **one-eighth of its annual perishable produce** with regards to the infrastructure for perishables (**fruits, vegetables, milk, meat, fish, etc.**).
- The value of food losses (agriculture, horticulture, milk, meat and fish) are above **₹1,40,000 crore a per year**.

### Benefits through PACS

- Farmers could sell their crops to PACS by receiving some **advance payment** at the Minimum Support Price and get **finance for the next crop cycle**.
- With efficient storage options, farmers can venture into **large-scale production and tap into export markets**.
- No issue around **distress sales and inflation** due to food loss/wastage would arise.

### Primary Agricultural Credit Societies (PACS)

- **Village level credit society** that acts as a foundation of cooperative credit framework at local level where **farmers contribute share capital, make deposits & loan money to one another**.
- Apart from providing agricultural loans, they also arrange for the **supply of agricultural inputs** (like seed, fertiliser, pesticide), **distribution** of consumer articles and **marketing** of produce for their members.
- PACS have over **13 crore farmers as members** and account for **41 % (3.01 Cr. farmers) of the KCC loans** given by all entities in the country and 95 % of these KCC loans (2.95 Cr. farmers) through PACS are to the **Small and Marginal farmers**.
- They act as a **link** between primary borrowers and higher lending institutions like State Cooperative Banks (StCB) and District Central Cooperative Banks (DCCB), NABARD and are **outside of the purview** of Banking Regulation Act, 1949.



- The budget 2023 announced the **computerisation** for 63,000 PACS and target establishment of **2 lakh multipurpose cooperatives** and PACS in the next 5 years.
- The problems associated with agriculture co-operatives include **elite capture, bureaucratic/political interference, poor marketing.**
- Since govt created **infrastructure** like canals, FCI godowns, HEPs are in dismal state, a caution being suggested about the **future and maintenance of godowns** under the control of PACS.

### Conclusion

- The decentralized storage capacity at the local level will **reduce food grain wastage, strengthen food security, prevent distress sale of crops, reduce transportation costs** and eventually lead to **rise in farmers' income.**
- Agriculture, contributing to **19% to India's GDP** sustains a **significant majority** of the population. Investment into agricultural infrastructure through the cooperative sector would play a central role in the country's **socio-economic development.**

### MUMBAI TRANS-HARBOUR LINK (MTHL): INDIA'S LONGEST SEA BRIDGE

**In News:** India's longest sea bridge, the **21.8 km long** MTHL bridge is nearing its completion.

- The MTHL project, worth Rs 18,000 Cr, connects **Sewri in Central Mumbai to Chirle in Navi Mumbai** and reduces the **travel time** from present 1-hour to **20 minutes.**
- Additional benefits from the project include **saving fuel, reduction of congestion and pollution** and **economic development** of **Chirle**, which is being dubbed as the **third Mumbai.**
- The project is being developed by Mumbai Metropolitan Region Development Authority (MMRDA) and financed by the Japan International Cooperation Agency (JICA).



The project is touted as the one with **several firsts** in India.

- **Longest sea bridge** in India (**World's 10th longest sea bridge**)
- 6-lane bridge with 2 emergency lanes, 21.8 km long (16.5 over sea and 5.5 over land) and 30.1 metre wide
- Proposed vehicle speed: 100 km/hour
- Artificial intelligence-based cameras to assist towing away of broken-down vehicles

### Features of MTHL

- First project in India with an **Open Road Tolling System** The system allows vehicles to electronically **pay the toll without stopping** at booths. (Operational in US, Singapore, etc.)

- **First usage of Orthotropic Steel Deck (OSD) technology** in India. The 180 m long orthotropic steel deck is said to be the **world's longest** level of span length. OSD bridges are **light weight and have a stronger structure** than concrete or composite girder bridges.

### Important bridges in India

#### Bhupen Hazarika Setu

- **Longest river bridge** in India
- Connects Dhola (Assam) and Sadiya (Arunachal Pradesh) over Lohit River
- **Speciality:** can withstand the load of **army tanks** like MBT Arjun and T-72
- Length: 9.15 km



#### Dibang River Bridge

- Connects Meka with Bomji in Arunachal Pradesh
- Length: 6.20 km



#### Bogibeel Bridge

- **Longest rail-road bridge** (4,940 m) in India
- **Specialty:** **two-tiered bridge** with three-lane road atop a double-line broad gauge railway track
- Location: Over Brahmaputra River in Assam
- Reduces distance between Dibrugarh and Guwahati and improves connectivity



#### Chenab Rail Bridge

- **Specialty:** **World's tallest railway bridge** (359 m above Chenab River)
- Specialty: Provides **all-weather rail connectivity** to J&K
- **1315 m** long bridge located in **Reasi** district of J&K



### AMRIT & MOONGA BLOCKS

**In News:** Oil and Natural Gas Corporation (ONGC) has made discoveries of oil and gas in Amrit and Moonga blocks in offshore Mumbai on the Arabian Sea.

- These discoveries are located in the blocks which the company won under the **new Open Acreage Licensing Policy (OALP)**.



## Open Acreage Licensing (OALP) mechanism

- It was launched under the Hydrocarbon Exploration and Licensing Policy, which provided potential investors with the **freedom to select blocks** of their choice by submitting an Expression of Interest (Eoi).
- Expressions of Interest (EOI) can be submitted at any time during the year, **eliminating the need to wait for a formal bid** round from the government. The selected blocks are then offered through a biannual formal **bidding process**.
- Under OALP, a bidder intending to explore hydrocarbons like oil and gas, coal bed methane, gas hydrate, etc can apply to the government seeking exploration of any new block which is not already covered by exploration.

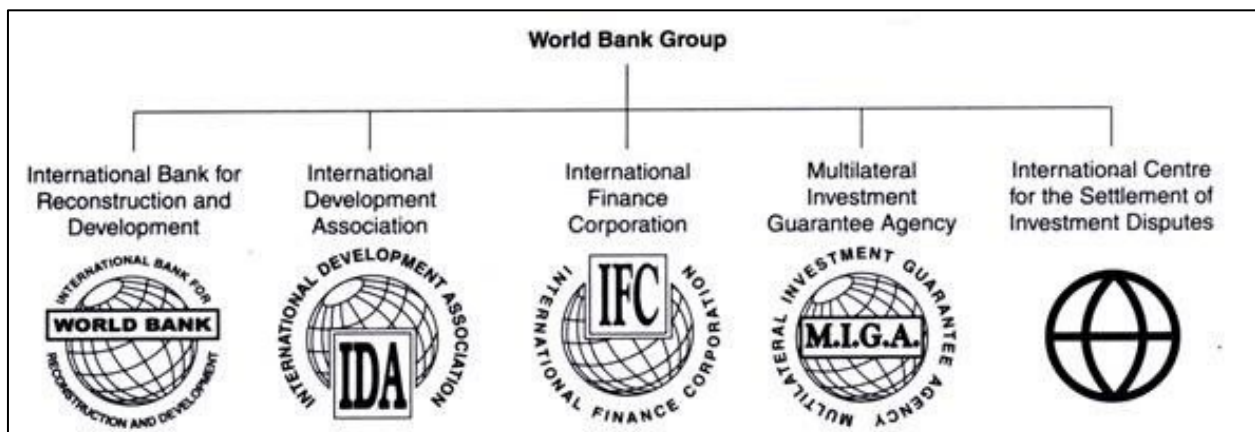
## Hydrocarbon Exploration and Licensing Policy (HELP)

- It was introduced in 2016, replacing the **New Exploration Licensing Policy (NELP)**. It adopted the **Revenue Sharing Contract Model** (away from profit sharing) with an aim to enhance the 'Ease of Doing Business' in the Exploration and Production (E&P) sector.
- It offered attractive terms including reduced royalty rates, no Oil Cess, marketing and pricing freedom, round-the-year bidding, freedom for investors to choose blocks, a **single license** for conventional and unconventional resources, exploration permission throughout the contract period, and a streamlined bidding and awarding process.

## WORLD BANK

- **Ajay Banga**, an Indian American, takes over as the CEO of the World Bank.
- He was chosen by the World Bank's Executive Directors for a five-year term.
- The President of the World Bank serves as the ex-officio chair of the Board of the Executive Directors for the 5 World Bank Group organizations.

## World Bank Group

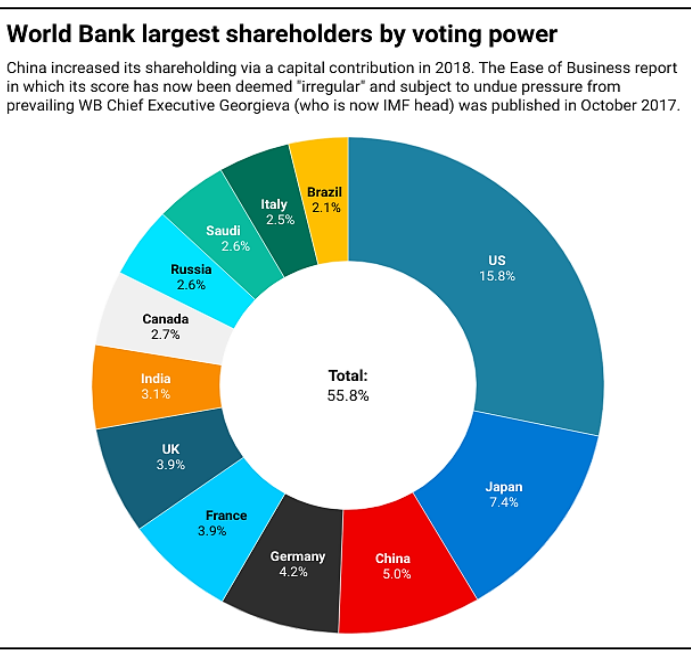


- The International Bank for Reconstruction and Development (IBRD) lends to governments of **middle-income and creditworthy low-income countries**.
- The International Development Association (IDA) provides interest-free loans, called credits and grants to governments of the **poorest countries**.
  - IBRD and IDA make up the World Bank.

- The International Finance Corporation (IFC) is the largest global development institution focused exclusively on the **private sector**. It helps developing countries achieve sustainable growth by financing investment, mobilizing capital in international financial markets, and providing advisory services to businesses and governments.
- The Multilateral Investment Guarantee Agency (MIGA) was created in 1988 to **promote foreign direct investment into developing countries** to support economic growth, reduce poverty, and improve people's lives. MIGA fulfills this mandate by offering political risk insurance (guarantees) to investors and lenders.
- The International Centre for Settlement of Investment Disputes (ICSID) provides international facilities for **conciliation and arbitration** of investment disputes.

### Establishment & Working of World Bank

- The World Bank was established in **1944** to help **rebuild Europe and Japan** after World War II. Its official name was the International Bank for Reconstruction and Development (IBRD).
- From 38 members in 1940s to **187 countries** at present, World Bank operates as **a giant cooperative**, where its **members are shareholders** and is operated for the benefit of those using its services.
- Priority guide for WB work: **end poverty, boost prosperity for the poorest people, help create sustainable economic growth**, investing in people and building **resilience to shocks and threats** that can roll back decades of progress.
- The **voting right** in world bank is proportional to shareholding pattern.
- The Bank, **headquartered in Washington DC, USA**, is also one of the world's largest **research centers in development**.



### ADB & INDIA

**In News:** The Asian Development Bank (ADB) has launched a new **Country Partnership Strategy (CPS)** for India.

- ADB's CPS for India (2023-2027) aims to deepen engagement and support India's pursuit of **robust, climate-resilient and inclusive growth**.
- Key focus areas of CPS: **employment generation, green growth promotion with inclusivity, sustainability, maintenance, and replicability** as main feature of projects.
- ADB will contribute to flagship programmes on developing **industrial corridors, multimodal logistic systems, urban infrastructure, skill ecosystem and small businesses**.



- ADB supports India's **climate agenda** through interventions in **energy transition, transport decarbonisation, climate adaptation, disaster risk management and net zero goals**, with a focus on public-private partnerships.
- The main challenge for ADB projects in India is considering a differential approach within higher and lower income states. Lower income states need **basic and critical infrastructure** whereas higher income states look forward to **reformative and innovative** practices.
- ADB has committed **USD 52.6 billion** in public sector loans, grants, and technical assistance, along with **USD 8.0 billion** in private sector investments, for various projects in India. Most of ADB's project fund **infrastructure, energy and water/infrastructure services**, etc.
- Examples of projects funded by ADB: metro expansion in Chennai, rural roads in Maharashtra, energy security in Tripura, industrial corridor in Andhra Pradesh, etc.

### Asian Development Bank (ADB)

- ADB envisions supporting a prosperous, inclusive, resilient, and sustainable **Asia and the Pacific**.
- ADB provides loan, grants, technical assistance for **extreme poverty eradication and developmental projects** among its **developing members**.
- Headquartered in **Manila, Philippines**, ADB has expanded from 31 members at its establishment in **1966** to 68 members, including 49 from Asia-Pacific and 19 from outside the region.
- ADB's five largest shareholders are **Japan and USA** (each with 15.6%), China (6.4%), India (6.3%), and Australia (5.8%).
- ADB member countries are allocated **votes based on their capital subscription**, similar to that of World Bank.

### NEW DEVELOPMENT BANK INDIA REGIONAL OFFICE (IRO)

**In News:** The launch of the NDB IRO aims to meet infrastructure and sustainable development requirements in India and Bangladesh, fostering economic growth and sustainable development in South Asia, aligning with the NDB's mandate.

### New Development Bank (NDB)

- It is a multilateral development bank established by the BRICS countries (Brazil, Russia, India, China, and South Africa) in 2014 at the 6th BRICS Summit at **Fortaleza, Brazil**.
- **Aim & Objective:** mobilising resources for **infrastructure and sustainable development projects** in BRICS and other **emerging economies**, promoting global economic governance and fostering closer cooperation among BRICS countries.
- **Member Countries** –Brazil, Russia, India, China, South Africa are the founding members. Bangladesh, UAE, Uruguay, and Egypt became the new members in 2021. The NDB's **Articles of Agreement** allow **all United Nations members to join**, ensuring that the **voting power of BRICS nations** remains **above 55%**.
- **Governance of NDB** – The NDB is overseen by a Board of Governors comprising the finance ministers of the BRICS countries.
- The bank is headquartered in **Shanghai, China**.

- Voting power in the NDB is determined by member shareholding. Currently, all members have **equal voting rights** and no one has veto power, but BRICS countries must retain at least 55% of the voting power.

### Gujarat International Finance Tech City (GIFT City)

- Situated on the banks of the **Sabarmati** River, a planned city, in Gandhinagar, Gujrat and emerging as the country's **first Green field smart city** (first time newly constructed).
- Aims to offer cutting-edge infrastructure and a favourable business environment **for finance, IT, and service sectors**.
- The city has its own regulatory authority, the **International Financial Services Centre (IFSC)** Authority, India's first and only IFSC to oversee and regulate financial activities within GIFT City.
- India International Bullion Exchange (**IIBX**) is the **first** International Bullion Exchange (A **bullion exchange** facilitates the trading of gold, silver, and related derivatives between buyers and sellers in a market setting) established in GIFT-IFSC, operating under the NSE IFSC-SGX Connect.



## CRUDE DERIVATIVES CONTRACTS

**In News:** NSE introduced **rupee-denominated NYMEX** (New York Mercantile Exchange) **WTI Crude Oil and Natural Gas futures contracts** in its commodity derivatives segment.

- The launch of these contracts on a single trading platform will offer market participants effective **trading and hedging** opportunities for key energy products.
- The addition of these contracts has expanded NSE's energy product offering and overall commodity segment.
- All Foreign Portfolio Investors (FPIs) categories are permitted to trade such as individual, family office and corporate FPIs.



### Crude oil

- Crude oil is a naturally occurring liquid petroleum product composed of hydrocarbon deposits and other organic materials formed from the remains of animals and plants that lived millions of years ago.
- The two main benchmarks of oil pricing are **West Texas Intermediate** (WTI) and **Brent crude**.

### Future Contracts

A futures contract is a legal agreement between two parties to **buy or sell an asset** at a **predetermined price and quantity** on a **specified future date**.

Parameter	Brent Crude	WTI Crude
Location	<b>North Sea region</b> near Scotland and Norway.	Oil fields in <b>USA and Gulf of Florida</b> region.
Benchmark prices	The international benchmark price for demands originating from <b>Europe region</b> .	A benchmark for <b>US oil</b> prices.
Sulphur content	0.37% – <b>Sour</b> crude oil.	0.24% – <b>Sweeter</b> crude oil.
Density	Brent has a <b>slightly higher</b> API gravity.	WTI the <b>lighter</b> of the two.

### American Petroleum Institute (API) Gravity

An indicator of the **density** of crude oil or refined products.

### Dubai/Oman Crude

Dubai/Oman crude reference is derived from **Persian gulf region** and is **lower-grade oil** than WTI or Brent. It is a '**sour**' category crude, **heavier** and with **higher sulphur content (2%)**. It serves as the main reference for Persian Gulf oil delivered to the Asian market.

### URAL Crude

Urals oil is a reference brand for pricing Russian export oil, consisting of a mix of heavy sour oil from Urals and the Volga region with light oil from Western Siberia.

Lately, Russia's largest oil producer Rosneft and India's top refiner Indian Oil Corp. agreed to **move away from Brent benchmark** and **use the Asia-focused Dubai oil** price benchmark in their latest deal to deliver Russian oil to India.

## VIVAD SE VISHWAS SCHEME

**In News:** The Vivad se Vishwas II (Contractual Disputes) scheme, introduced in the 2023-24 Budget, aims to **resolve pending disputes** associated with government contracts.

- Contractors will be provided settlement amounts based on the **status of the dispute**.
- In cases of disputes where **court or arbitral order** has been passed, the settlement amount would be **85% or 65%** of the amount awarded by the court or the arbitral tribunal respectively.
- It would be **mandatory** for government departments to accept the settlement where the **claim amount is Rs 500 crore or less**.
- The scheme is aimed at **clearing the backlog of litigation, freeing lock-up funds, and improving the ease of doing business**.
- It is launched by the **Ministry of Finance** under the Department of Expenditure.



### Vivad Se Vishwas scheme I

- The scheme offers relief by **refunding the forfeited amount** for non-compliance of **contract obligations** during the Covid-19 period.
- Scheme was introduced for micro, small and medium enterprises (MSMEs) in contract with government parties.

## C-PACE

**In News:** The Ministry of Corporate Affairs (MCA) has established the **Centre for Processing Accelerated Corporate Exit** (C-PACE) to streamline the process of removing companies from the ministry register.

- C-PACE will provide **hassle-free filing, timely and process-bound striking off** their company's names from MCA register.

- It aims to alleviate the **workload on the registry** and offer stakeholders a **streamlined and efficient process** for exiting a business.
- Headquartered in **Manesar, Gurugram**, C-PACE is part of MCA's efforts towards **ease of doing business** and **ease of exit** for companies.



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# INTERNATIONAL RELATIONS & SECURITY

## INDIA-RUSSIA FTA & EURASIAN ECONOMIC UNION (EAEU)

**In News:** India and Russia in the recent meeting of **Intergovernmental Russian-Indian commission on trade and economic cooperation in April 2023** expressed their interest in intensifying the FTA negotiations involving the **Eurasian Economic Union (EAEU)**, a regional economic bloc led by Russia.



- After being declared among Russia's **"trusted foreign partners"**, India has highlighted the urgent need to **address the trade imbalance** created by the recent increase in two-way trade to \$45 billion due to **discounted Russian oil imports**.
- The bilateral trade in 2022-23 (approx. **\$45 billion**) surpassed the target of **\$30 billion set for 2025**.
- The FTA, which would be a step in the same direction, aims to build closer economic ties between the two countries, especially in the areas of **energy, defence, trade and investment**.
- Presently, India faces trade restrictions with Russia in terms of non-tariff barriers (pharma, bovine/dairy exports), payments and logistics.
- The objective is to **diversify and expand the basket** of goods by exploring possibilities in **automobiles and spare parts, electronics goods, medical devices, solar photovoltaic modules, textiles, food and agricultural products**.
- The talks also reflect the **strategic partnership** between India and Russia, which has **remained steady** despite the geopolitical tensions over Ukraine.

### EAEU

- The EAEU is an economic union of **five post-Soviet states: Russia, Kazakhstan, Kyrgyzstan, Armenia and Belarus**.
- It was established in **2015** and has a combined GDP of about **\$2 trillion** and a population of about **184 million**.
- India has been in talks on a **Comprehensive Economic Partnership Agreement (CEPA)** with the EAEU since 2017.
- India-Russia trade reached **\$45 billion** in **2022-23**, However, this has also created a **trade imbalance** in favour of Russia, which India has urged to address by removing market access barriers and non-tariff measures for Indian exports.



## Benefits of FTA to India

- **Preferential access to a large and growing market:** with inroads to eastern-Europe as well
- **Enhance India's energy security:** at competitive prices
- Boost India's **defence industry: joint production, technology transfer and research and development**
- Strengthen India's **strategic autonomy**
- Attract more **Russian investments (FDI)**

## Present Challenges

- Opposition from USA/western countries
- Balancing interests with **strategic partner US** in context of geopolitical rivalry
- Harmonisation of **standards, regulations and customs procedures**
- Address non-tariff barriers such as **sanitary and phytosanitary measures, intellectual property rights and labour standards**
- Competition from Russian and other EAEU products in sectors such as **steel, chemicals, pharmaceuticals, etc.**

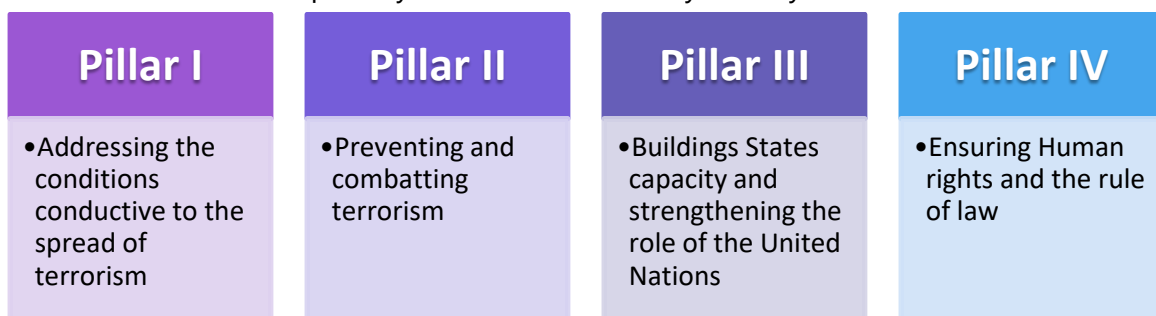
## SCO FOREIGN MINISTERS' MEET, GOA

**In News:** India rebuked Pakistan on the matter of **state-sponsored terrorism** at SCO foreign ministers' meet at Goa.

- In defense, Pakistan has long **continued to renounce** that it has been supporting anti-India terror groups from its soil. It defends itself by saying it is a **sufferer and not a perpetrator** of terrorism.
- Contrastingly, there has been a **visible change in India's stance** on Pakistan's involvement in terrorism.
- Previously, India would **engage, provide evidence, overlook many sub-conventional strikes** (ISI's involvement in 26/11 Mumbai and Parliament attack) and give **unilateral concessions** to Pakistan.
- But lately, India has adopted a more **aggressive approach to name, shame and blame Pakistan** for its anti-India activities.
- India at SCO meeting stated that the **victims of terrorism** do not sit together with **perpetrators of terrorism** to discuss terrorism.
- Pakistan's support to "**good Taliban**" and killing of the Al Qaeda leader **Osama Bin Laden** in 2012 have proven Pakistan's hand in **sheltering global terrorists**.

## 4 pillars of UN Counter Terrorism Strategy

Adopted by UN General Assembly in the year 2006

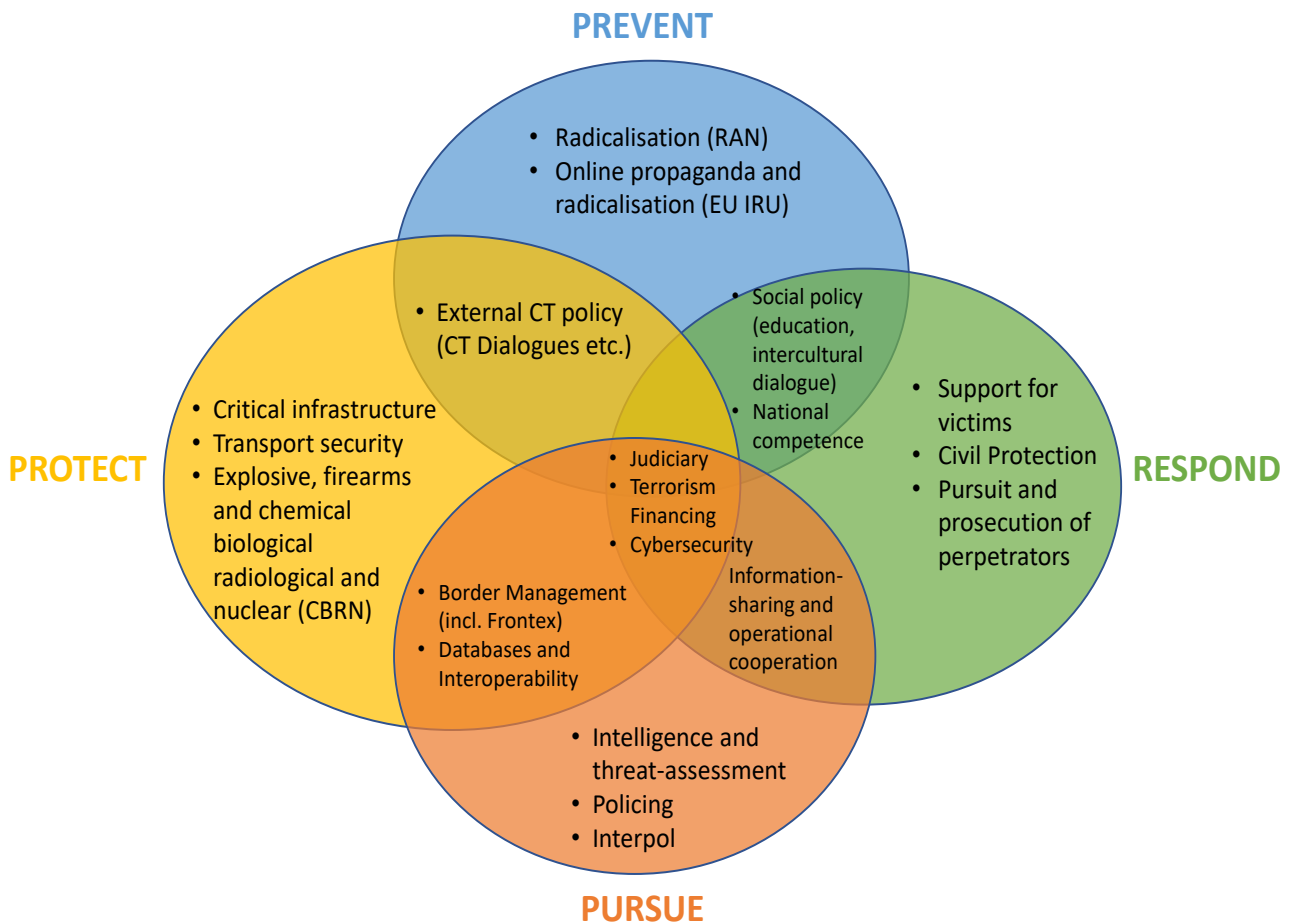




## Actions to be taken at local, national, EU and international level across 4 pillars



India's action to handle terrorism could be based on the following 4 pillars:

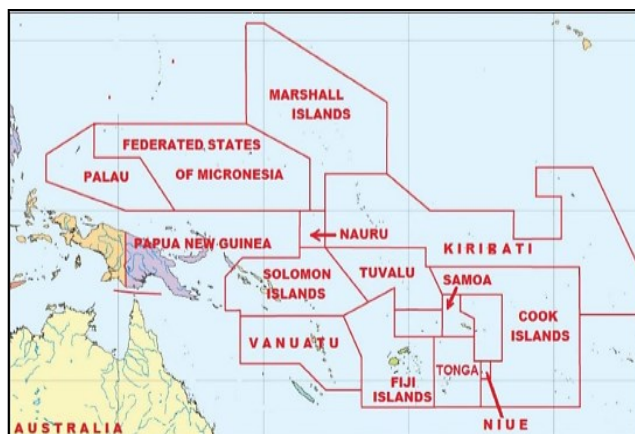


## FIPIC SUMMIT

**In News:** Indian PM first time visited **Papua New Guinea** for **3rd Forum for India-Pacific Islands Cooperation (FIPIC) summit, 2023**.



- These islands have large **exclusive economic zones (EEZs)** despite their relatively small size & considerable distance from India, FIPIC initiative marks serious efforts in expansion of **India's engagement in the pacific region**.
- Annual trade between India and pacific island countries is valued at **\$570million** (based on 2021-22 data) in commodities such as **plastics, pharmaceuticals, sugar, mineral fuel and ores**, with **Papua New Guinea** as the biggest trade partner.
- The Indian government during the second FIPIC Summit in Jaipur 2015, announced an allocation of **\$12 million grant (\$1 million for each India-Pacific Small Island Developing States)** and **concessional line of credit of \$150million** for undertaking solar, renewable energy and climate related projects.
- During the summit India announced Establishment of a **super-specialty cardiology hospital** in **Fiji**, **Sea ambulances** for each state, pledged to provide desalination units for the people of every Pacific Island country.



### About FIPIC

- With an aim to increase India's engagement with Pacific Small Island nations, the Forum for India-Pacific Islands Cooperation (FIPIC) was launched in Nov 2014.
- It includes 14 island countries: **Cook Islands, Fiji, Kiribati, Marshall Islands, Micronesia, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu** – that are located in the Pacific Ocean.

**Exclusive Economic Zones (EEZs)** is the distance up to which a coastal nation has jurisdiction over the ocean, including both living and non-living resources. It generally goes to 200 nautical miles or 230 miles (around 370 km) beyond a nation's territorial sea.

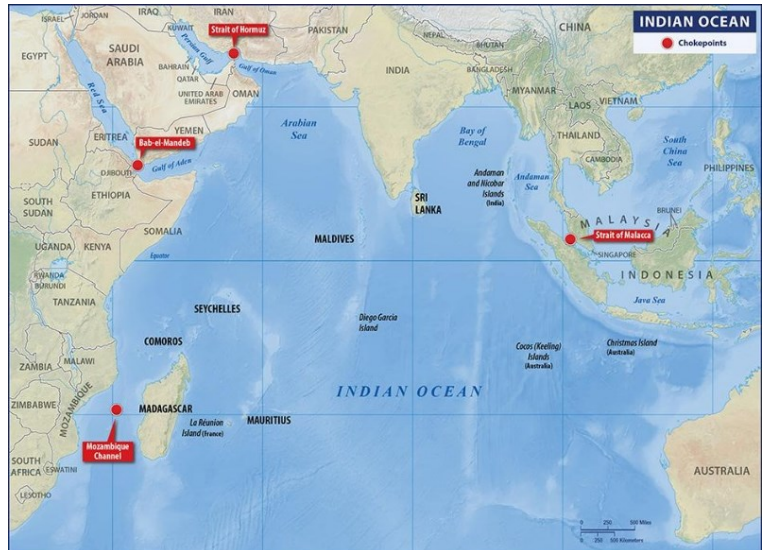
## SIXTH INDIAN OCEAN CONFERENCE

**In News:** With the theme '**Peace, Prosperity and Partnership for a Resilient Future**', Bangladesh hosted the **sixth Indian Ocean Conference (IOC)**.

- The event was mainly organised for the coastal countries of the Indian Ocean and it also included representatives from **D-8 (Developing-8), SAARC and BIMSTEC**.
- The conference endeavours to bring **critical states and principal littoral/maritime partners** of the region together on a common platform to deliberate upon the prospects of regional cooperation for **Security And Growth for All in the Region (SAGAR)**.

- The Indian Ocean Conference was started by India-based thinktank **India Foundation** in **2016** at **Singapore**, with participation from 30 countries.
- The **Indian Ocean region** has significant **economic, political, and strategic implications** for the world as it shares **64% of the global population and 60% of global GDP**.
- emerged as the **flagship consultative forum** for countries in the region over regional affairs.

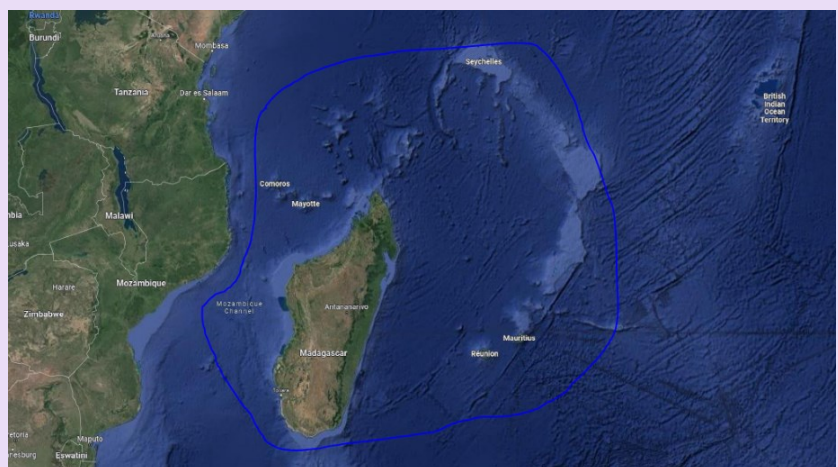
### Significance of Indian Ocean Region



- The Indian Ocean is a **vast theatre**, stretching from the Strait of Malacca and western coast of Australia in the East to the Mozambique Channel in the West. It encompasses the Persian Gulf and the Arabian Sea in the North, all the way down to the southern Indian Ocean.
- It is a **vital trading hub**, connecting the Middle East to Southeast and East Asia, as well as Europe and the Americas. Over **80% of the world's oil passes** through the Indian Ocean's waters. Of the world's seven **key choke points** for oil transportation, **three** are in the Indian Ocean.
- Presence of regional hegemon like **China, France and India** along with USA, UK and Russia in the form of bilateral or regional groupings has increased the **geo-political tensions** around **marine diplomacy, freedom of navigation/ open sea lines of communication (SLOC)** on one hand and **climate vulnerability, illegal fishing, drug smuggling, human trafficking and sea piracy**.
- From **resource-rich Africa** and the **energy-dense Middle East** to **South Asia's labour markets and manufacturing industries**, the stability of the Indian Ocean is crucial to the global economy.
- China, well aware of its growing strategic importance and economic footprint in the region recently organised the first **"China-Indian Ocean Region Forum"** with **19 other countries** (including Pakistan, Myanmar) as invitees.

### Indian Ocean Commission

- An intergovernmental organisation formed in 1984 by the Victoria Agreement (Seychelles).
- It comprises **five member states**: **Comoros, Madagascar, Mauritius, Réunion (French overseas Territory), and Seychelles**.
- It promotes diversified cooperation for the sustainable development of the Indian Ocean region, such as integrated management of



marine and coastal ecosystems, sustainable fisheries, environmental education, health, governance, maritime safety, agroecology, culture, etc.

### Indian Ocean Rim Association (IORA)

- **Established in 1997 and headquartered in Mauritius** as the Indian Ocean Rim Association for Regional Cooperation (IOR-ARC) and later **renamed as the Indian Ocean Rim Association (IORA) in 2013.**
- Aimed at **strengthening regional cooperation and sustainable development** within the Indian Ocean region.
- Focuses **on six priority areas** of cooperation: maritime safety and security, trade and investment facilitation, fisheries management, disaster risk management, tourism and cultural exchanges, and academic, science and technology cooperation.
- Membership involves **23 countries**, with **10 dialogue partners** which include China, Japan, Russia, the U.K. and the U.S.



### COLOMBO SECURITY DIALOGUE

**In News:** Recently 7th Deputy NSA Meeting of **Colombo Security Conclave** held in Maldives.

- Colombo Security Conclave is a **regional security initiative** involving **India, Sri Lanka, Maldives and Mauritius** as members, and **Bangladesh and Seychelles** as the observers.
- It was established in **2011** as a **trilateral maritime security grouping**, but was revived and expanded in 2020 and 2021 to address other security challenges in the Indian Ocean region. Its secretariat is based in Colombo.
- It aims to create a platform for closer cooperation under the **five pillars** which include **maritime safety and security, combating trafficking and transnational organised crime, countering terrorism and radicalization, cybersecurity, protection of critical infrastructure and humanitarian assistance and disaster relief.**
- With **secretariat at Colombo**, it holds regular meetings of the **national security advisors (NSAs)** and **deputy national security advisors (DNSAs)** of the member countries to facilitate dialogue and collaboration.
- It is seen as **India's outreach** to the Indian Ocean to underline regional cooperation and shared security objectives, especially in the **context of China's growing presence** and influence in the region.



- Beijing's growing naval presence near India's coastline shows through ports and projects in the region, such as its **military base in Djibouti**, and its management of the **Gwadar port in Pakistan and the Hambantota port in Sri Lanka**.
- The success of CSC lies in non-duplication of initiatives with **Indian Ocean Rim Association and Indian Ocean Naval Symposium, better coordination** with parallel organization, **insulating** the group from domestic politics and **non-projection of the forum as anti-Chinese grouping**.
- India held **Exercise Dosti** with CSC members Sri Lanka and Maldives in the year 2021.

### Indian Ocean Naval Symposium (IONS)

- It was established in 2007, as a **voluntary initiative** and a premier forum for cooperation and collaboration **among navies of 36 littoral states** of the Indian Ocean Region.
- The forum has enabled discussions on regional maritime issues, promoted friendly relationships, and significantly improved maritime security cooperation in the Indian Ocean Region.
- The regional grouping Indian Ocean Naval Symposium (IONS) conducted its maiden edition of maritime exercise, **IMEX-22, at Goa** with an aim to enhance interoperability in **Humanitarian Assistance and Disaster Relief (HADR)**.

### G7 SUMMIT

**In News:** World's most powerful democracies gathered for the **annual G7 summit** in Hiroshima, Japan and discussed pressing issues from **economic security, nuclear disarmament, rise of Chinese assertiveness, Russia-Ukraine conflict, supply chain disruptions and the problem of regulating generative AI etc.**

- Stressing the importance of reaching out developing countries, the leaders of **Australia, Brazil, Comoros, Cook Islands, India, Indonesia, South Korea and Vietnam** were also invited by host Japan. G7 leaders discussed how to deal with **China's growing assertiveness and military buildup** as concerns rise that it could try to **seize Taiwan** by force, causing a wider conflict.
- They also focussed on ways to reduce **economic and supply chain dependency** on China.
- G7 leaders discussed '**responsible AI**' and Global AI governance to promote **human centric and trustworthy AI** based on **OECD AI Principles**.
- They also initiated the '**Hiroshima AI Process**' to determine a way forward to regulate artificial intelligence. The process entails emphasis on **freedom, democracy and human rights** and involves **multi stakeholder organisations and processes**.
- G7 also reiterated its commitment to turn **net-zero by 2050** and stressed on the need for a **global peak in emissions by 2025** by member states in order to remain well below the rising temperature target of **1.5 degree Celsius target**.



### Why meet at Hiroshima?

- The **choice of Hiroshima**, the victim of the first atomic bomb nicknamed '**Little Boy**' attack on **6 Aug, 1945**, as host city of the G7 Summit **underlines Japan's commitment** to put **nuclear disarmament and non-proliferation** prominently on the agenda of the meeting.

## G7

- It is an **informal group** of world's highly influential and advanced countries to discuss **macroeconomic policy, rule-based order and global governance**.
- It was formed in **1970s** with **no charter, no permanent office or secretariat**.
- Group of Seven (G7) comprises of **United Kingdom, United States, Canada, France, Germany, Italy, Japan**
- **Russia** was a part of the group during the period 1998-2014. During the period, the grouping was called as **G8**.
- **EU** has participated as an **unofficial 8<sup>th</sup> member** of the group without full privileges of a member nation.

### Issues around G7:

- An **exclusive, invitation-only grouping** of the world's richest economies which **doesn't reflect the dominant majority** in the functioning of the global economy
- **Reduction in economic presence** of G7 from approx. 60% of World GDP during 1970s to 30% of World GDP at present. **G20** is a far more representative body reflecting **85% of World GDP**.
- **No binding resolutions** at the meetings.
- **No firmness and joint policy action** in actions against China.

### India's Role at G7 Meeting:

- **Act as bridge** between the West and the Global South
- Mandate to **coordinate negotiations** on peace, stability and negotiations between the warring Russia and Ukraine.

## INDIA & ASEAN AT UN PEACE KEEPING

**In News:** India plans to conduct two training initiatives for women personnel from South East Asia under '**India-ASEAN Initiative for women in UNPK operations.**'

- Proposed by Defence Minister Rajnath Singh in November 2022 at **Siem Reap, Cambodia**, to commemorate the **30<sup>th</sup> Anniversary of India-ASEAN relations**.

### UN Peacekeeping Force

- UN Peacekeeping is a **multinational mission** by the United Nations to maintain peace and security in conflict-affected regions.
- UN Peacekeeping adheres to **three core principles: party consent, impartiality and non-use of force, except in self-defence**.
- It was established in **1948**, and the first peacekeeping mission, the "UN Truce Supervision Organization," began operations in Palestine (to oversee **Israeli-Arab armistice agreement**).  
It is aimed to implement peace agreements, protect civilians, support political processes, and promote human rights by involving military, police, and civilian personnel from various nations, operating under the authority of the **UN Security Council**.

## India's role in UN Peacekeeping Missions

- Indian personnel have made significant contributions to UN Peacekeeping, with 6,097 currently serving, ranking third after **Bangladesh** (7,237) and **Nepal** (6,264).
  - India has contributed the **maximum number of personnel and sacrificed peacekeepers** by contributing to approx. 50 out of 70+ UN Peacekeeping missions.
  - Major incidents of India's participation in UN Peacekeeping missions:
    - India made its initial contribution to UN Peacekeeping by participating in the UN operation in **Korea** during the 1950s.
    - India's armed forces were entrusted with peace missions in **the Middle East, Cyprus, and Congo**, etc. by the UN.
    - India served as the Chair of international commissions for supervision and control in Vietnam, Cambodia, and Laos, established by the 1954 Geneva Accords on Indochina.
- India deployed the **first-ever all-women contingent** to a UN Peacekeeping Mission to Liberia in 2007.



## PM ON UNITED NATIONS

**In News:** Addressing a G7 session in Japan's Hiroshima, India's **PM questioned the effectiveness of UN** and its Security Council.

- Emphasizing that UN has a **greater role to play** in promoting **peace and stability**, especially in the developing world, he said that UN would be reduced to a **"talk shop"** if they didn't resolve the **growing conflicts**.
- The PM also called for **respecting the sovereignty and territorial integrity** of all countries and **joint opposition to unilateral changes** in the status quo anywhere in the world.

### UNSC Reforms:

- Enlarging the security council** to include emerging and representative countries and contemporary realities.

### United Nations

Intergovernmental organization

**Founded:** October 24, 1945, San Francisco, California, United States

**Key documents:** The UN Charter  
Universal Declaration of Human Rights  
Convention on the Rights of the Child  
Statute of the International Court of Justice

**Member States:** 193

**Main Organs:**



**The work of the United Nations covers five main areas:**

- Maintain International Peace and Security
- Protect Human Rights
- Deliver Humanitarian Aid
- Support Sustainable Development and Climate Action
- Uphold International Law

- Enforcing **conflict prevention** diplomacy: condemning unilateral/ unapproved aggression
- **Strengthening peacekeeping** operations: channelizing resources, funds, etc.
- Improving **developmental cooperation**

### UAE-OMAN-INDIA UNDERSEA GAS PIPELINE

**In News:** International consortium **South Asia Gas Enterprise (SAGE)** is seeking **political and diplomatic backing** of the ministry of petroleum and other stakeholders to develop a \$5 billion **Middle East-India Deepwater Pipeline (MEIDP)** from the Gulf to India.



- The proposed **2,000-km energy corridor** connecting the Middle East and India would offer options to import gas from Oman, UAE, Saudi Arabia, Iran, Turkmenistan and Qatar.
- The project can lead to an **annual saving** of around **\$945 million** with supply of a **reliable and cost-effective source** of natural gas in comparison to importing similar amounts of liquefied natural gas.
- Passing through the Arabian Sea, the pipeline will reach depths of 3,400 metres under the sea and a length of 1,400 km.
- The subsea pipeline will be bypassing the **exclusive economic zone (EEZ)** of Pakistan and transport up to 31.1 million standard cubic metres per day of gas from Chabahar in Iran and Ra's al Jifan in Oman to Porbandar in Gujarat.
- India is looking to **diversify** its energy sources and increase the **share of gas in its energy mix**. The **fertiliser and power** sector can be main users of the gas.
- It is seen as an alternative to the stalled **Iran-Pakistan-India (IPI)** and **Turkmenistan-Afghanistan-Pakistan-India (TAPI)** pipeline projects, which face security and geopolitical risks.

#### Iran-Pakistan-India (IPI) Pipeline

- The project was aimed to transfer gas from **Iran's South Pars fields** in the Persian Gulf to Pakistan and India, with an estimated value of USD 7 billion.
- India left the project in 2009 due to security and pricing issues, and the pipeline became Iran-Pakistan (IP) pipeline.

#### Turkmenistan-Afghanistan-Pakistan-India (TAPI) pipeline

- TAPI pipeline project is a natural gas pipeline that aims to transport gas from Turkmenistan's **Galkynysh gas field** through Afghanistan, Pakistan and India.
- The project is expected to cost around USD 10 billion and have a capacity of 33 billion cubic metres per annum.



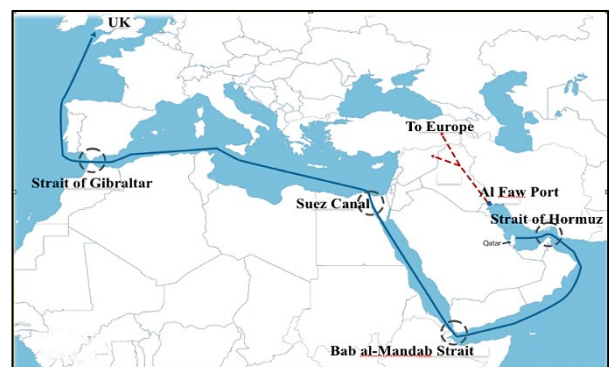
- The **1,800-kilometre natural gas pipeline** is developed by the Galkynysh – TAPI Pipeline Company Limited with participation of the **Asian Development Bank**.
- It was supposed to be completed by December 2019. The project has faced several delays due to political, security and technical challenges in the region (India-Pakistan tensions and the Taliban situation in Afghanistan).
- The project is still under construction. India has recently reiterated its support for the project and called for a stable Afghanistan to ensure its security. The Taliban has also expressed its willingness to cooperate with the project.



### ROUTE OF DEVELOPMENT

**In News:** Iraq has commenced construction of a strategic transport hub, worth **\$17 billion**, known as the "**Route of Development**," which will serve as a vital link connecting **Europe to Asia**.

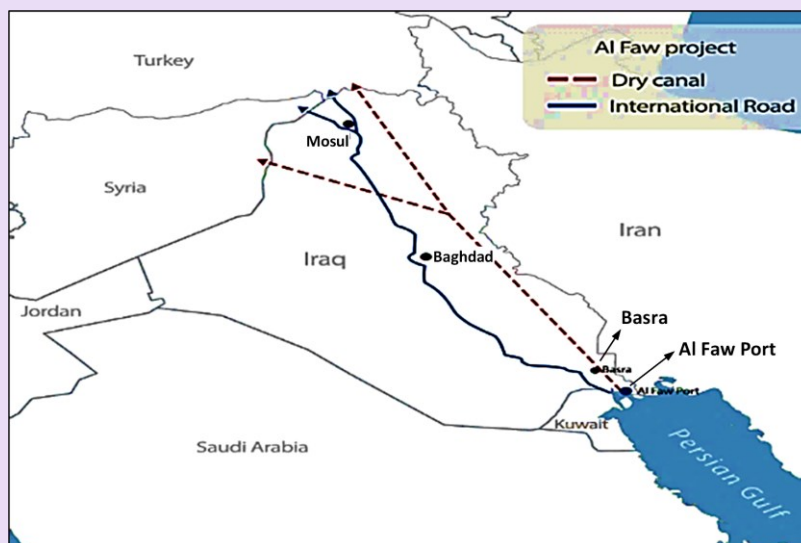
- It is a road and rail infrastructure network of **1200 km** length connecting the **Turkish border** in the North and **Grand Faw port** in south Iraq.
- This network will facilitate the operation of high-speed trains capable of speeds up to 300 km/hr, serving both **freight and passenger** transportation.
- It is envisioned as a **panacea** for war-ravaged Iraq, which has been impacted by the US invasion and the Islamic State. It is expected to serve as a pillar for a **sustainable non-oil economy** in the country.
- This network has potential to serve both an alternative and a competitor to the **Suez Canal**.



### Grand Faw Port

- An **under-construction** port of Iraq which holds strategic importance.
- Located **Al Faw Peninsula south of Basra in Iraq**.

- This port is the **world's longest breakwater port** (a protective structure built in the sea to shield the shore from waves), spanning a length of 10 miles.
- Grand Faw port is developed under the **Dry Canal** project which consists of railways, road, highways and oil pipelines to connect the Persian Gulf with Europe.
- A **dry canal** is a transportation system that connects bodies of water to land using roads or rail networks, enabling cargo to be unloaded from ships at one end, transported over land, and then loaded onto ships at the other end for further transportation.



### International North–South Transport Corridor (INSTC)

- INSTC is a **multi-modal transport project** spanning over 7,200 kilometres, connecting India to Russia.
- The objective is to provide an **alternative route to the Suez Canal**, connecting Mumbai in India and St. Petersburg in Russia and further to Europe with **reduced transit time** through an **intergovernmental framework**.
- The INSTC envisages the movement of goods from Mumbai (India) to **Bandar-Abas port** (Iran) by **sea**, from Chabahar to **Bandar-e-Anzali** (an Iranian port on the Caspian Sea) by **road**, and from Bandar-e-Anzali to **Astrakhan** (a Caspian port in the Russian Federation) by **ship** across the Caspian Sea, and after that from Astrakhan to other regions of the Russian Federation and further into Europe by **Russian railways**.



- **Route of Member countries** – India, Iran, Azerbaijan, Russia along with other peripheral members like Kazakhstan, Armenia, Belarus, Tajikistan, Kyrgyzstan, Oman, Syria, Turkey, and Ukraine with Belarus as observer status.
- **Significance for India:**
  - It will connect Mumbai to St. Petersburg in Russia with a **reduction in transit time by 40% and reduced freight cost by 30%** in comparison to the Suez Canal route.
  - It provides **easy access to Central Asian markets**.

- India is actively working to connect INSTC to **Chabahar port** to avail additional advantages and opportunities.

### Suez Canal

- The **Suez Canal** is an **artificial sea-level waterway** in **Egypt** that connects the **Mediterranean Sea** to the **Red Sea**, running across the **Isthmus of Suez**.
- It presently serves as the **shortest route** connecting South-East Asia to Europe and handles approximately **12% of global trade**.
- It was inaugurated in 1869 and has the following dimensions: Length - 193.3 km, Depth - 24 metres, Width - 205 metres.



### MILITARY EXERCISES/DISASTER RELIEF

Exercise	Description
Al Mohed Al Hindi 23	2 <sup>nd</sup> edition of Indian Navy and Royal Saudi Naval Force (RSNF) was held in Saudi Arabia.
Sudarshan Shakti	The Sapta Shakti Command of Indian Army conducted exercise 'Sudarshan Shakti 2023' along the Western Rajasthan and Punjab.
Samudra Shakti, 2023	4 <sup>th</sup> edition of the Indo-Indonesia bilateral Exercise concluded in the South China Sea.
Jal Rahat	NDRF, SSB, SDRF-Assam, Assam police, Chirang DDMA conducted flood relief exercise at Hagrama Bridge along the Aie River.
Ajeya Warrior, 2023	The 2023 edition of the biennial military exercise between India & UK was held at UK.

### TARINI

**In News:** Indian Naval Sailing Vessel (INSV) **Tarini** with a **six-member crew (Including two women members)**, returned to Goa, India after successfully completing a **17,000 NM (nautical mile) trans-ocean inter-continental voyage after 188 days**.

- The 188-day voyage of INSV Tarini's historic voyage was from **Goa to Rio de Janeiro via Cape Town and back**.
- Earlier, the INSV Tarini set sail for an expedition to Cape Town, South Africa to participate in the **50th edition of Cape to Rio Race 2023**. The ocean sailing race starting from Cape Town and culminating at Rio de Janeiro, Brazil, is one of the most prestigious **Trans-Atlantic ocean races**.
- The achievement of crew in navigating through **adverse weather conditions and undertaking in-house repairs** whenever needed are shining examples of **innovation and ingenuity** that the personnel possess.



- This sailing expedition of INSV Tarini is part of the run-up towards the Navy's next big project to **send a woman to circumnavigate the globe solo**.
- INSV Tarini is also known for **circumnavigating the globe** with an all-women officer crew in the historic expedition titled '**Navika Sagar Parikrama**' that began in 2017.

## KHEIBAR

**In News:** Iran successfully test-launched a new **surface-to-surface 4th generation Khorramshahr ballistic missile** called **Kheibar** with a potential **2,000-km range** capable of reaching the bases of arch-foes Israel and United states in the region.



- The state news agency IRNA said the **liquid-fuel missile** had been named the "**Kheibar**", a reference to a **Jewish castle overrun by Muslim warriors** in the early days of Islam.
- Iran said its precision-guided ballistic missile is capable of carrying **multiple warheads, evading enemy radars** and is able to carry a **1,500kg warhead**.
- Iran says its precision ballistic missiles are an important **deterrent and retaliatory force** against potential regional adversaries.
- In reaction, the US claimed Iran's development and proliferation of ballistic missiles poses a **serious threat to regional and international security** and remains a significant **non-proliferation challenge**.

**Ballistic Missiles** A ballistic missile is a **rocket-powered weapon** that travels in a high, arched trajectory, leaving and **re-entering the Earth's atmosphere**, and designed to deliver a high explosive or nuclear warhead to a fixed target at a long range, making it **difficult to intercept** due to its **high speed and altitude**.

## SILKWORM EATING STRATEGY

**In News:** China frequently conducts military activities, including incursions into the **Taiwan Air Defense Identification Zone (TADIZ)** and large-scale exercises, as part of its strategy towards Taiwan.

- "**Silkworm eating**" refers to the gradual encroachment strategy employed by a country to make successful inroads into another territory.
- PLA sorties challenge Taiwan's sovereignty and exhaust its military resources.
- This strategy is similar to **Salami Slicing, a divide-and-conquer** tactic used to dominate opposition territory, piece by piece.
- Small military actions **avoid diplomatic attention** but they accumulate over time and result in a strategic advantage for the aggressing country.
- China continuously uses this technique against India, Japan (over Senkaku Islands/Diaoyu Islands), South and East China sea for hydrocarbon exploration & fishing rights.





# SCIENCE AND TECHNOLOGY

## SEMI-CRYOGENIC ENGINE TEST BY ISRO

**In News:** ISRO successfully tests a **semi cryogenic engine** with **2000kN thrust** at the newly commissioned **Semi Cryogenic Integrated Engine & Stage Test facility** in **Mahendragiri, Tamil Nadu**.

- The first integrated test of a semi cryogenic engine on an intermediate configuration designated as **Power Head Test Article (PHTA)**, comprised all the engine systems, except the thrust chamber.
- The test was to validate the design of the **propellant feed system, including the low-pressure and high-pressure turbo-pumps, the gas generator, and control components**.
- This test demonstrated the **complex chill-down operations** spanning about 15 hours duration that was conducted successfully, meeting all the required conditions for engine start.
- **Cryogenic line chill-down** is the process of **cooling the transfer line** of cryogenic fluids normally from the room temperature to a cryogenic temperature to ensure cryogenic fluids arrive at the destination place in a liquid state. It is an essential part of the cryogenic fluid management, a critical prerequisite to furnish a steady and safe operating environment for a cryogenic system.
- **ISRO's Liquid Propulsion Systems Centre (LPSC)** has undertaken the design and development of a semi cryogenic engine with participation of Indian industry.
- It works on **Liquid Oxygen (LOX) Kerosene propellant combination** and **will power the booster stages** of future launch vehicles.

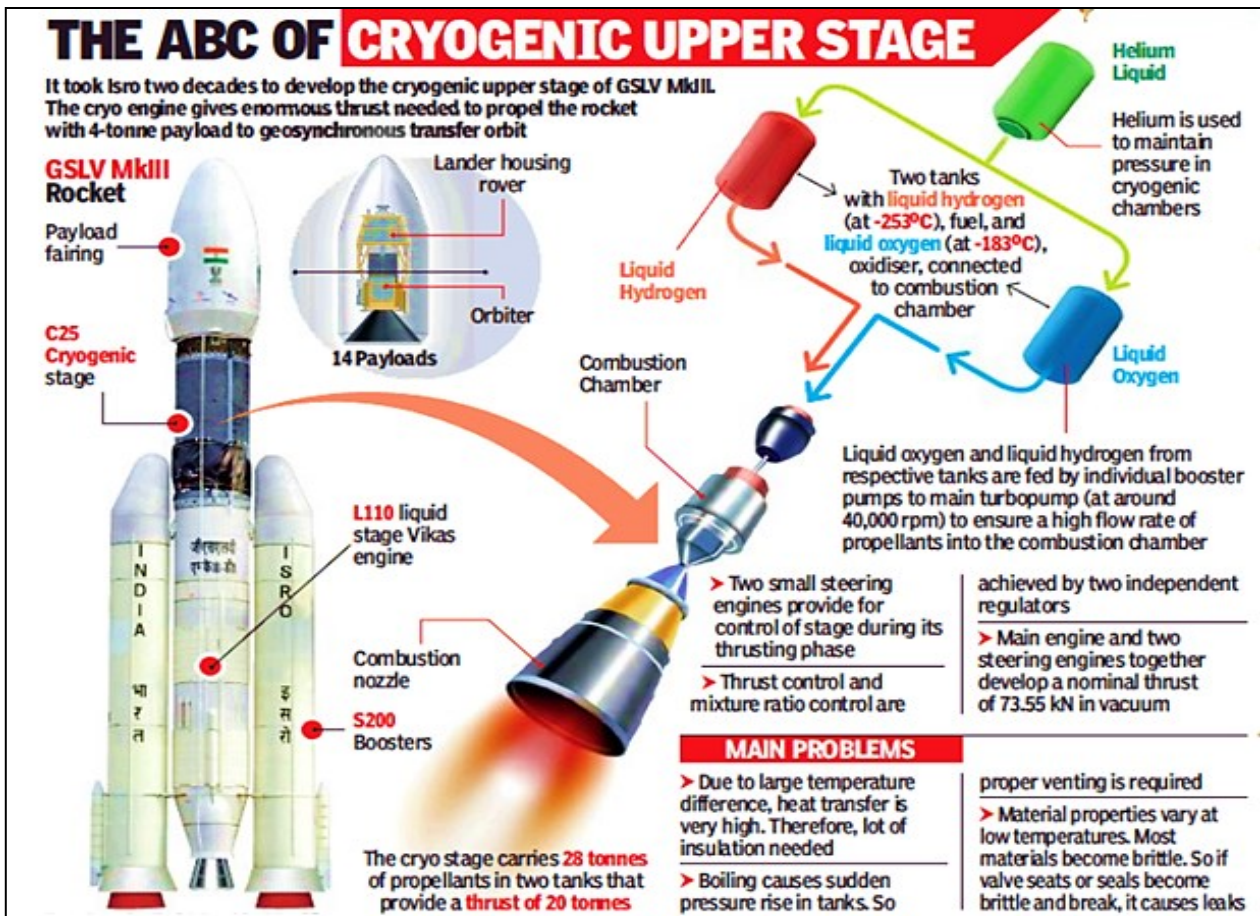


- Cryogenics is the outcome of the **production of and behaviour of materials at very low temperatures**. Ultra-cold temperatures change the chemical properties of materials.
- Rocket engines need high mass flow rates of both oxidizer and fuel to generate useful thrust. While it is possible to store propellants as pressurised gases, this would require large, heavy tanks. On the other hand, if the **propellants are cooled** sufficiently, they exist in the liquid phase at higher density and lower pressure, **simplifying tankage**.
- Development of a cryogenic stage has unique design challenges, with **liquid Hydrogen** stored at -253 deg C and **liquid Oxygen** stored at -183 deg C in its tanks.
- Due to large temperature difference, heat transfer is very high. Hence, to store and transfer these cryogenic fluids, **special multi-layer insulation** is provided for the tanks and other structures.

### Importance of Semi Cryogenic Engine test milestone

- A cryogenic engine/cryogenic stage is the **last stage of space launch vehicles** which makes use of low temperature technology to store rocket's fuel and oxidiser as liquids instead of gas.

- In space, there is a **lack of air, including oxygen**, which means it is impossible to burn anything. To fix this, rockets carry their own oxygen, known as an oxidiser, mixed with fuel to burn it in space.
- The advantage of using a semi-cryogenic engine is that it requires **refined kerosene**, which is **lighter than liquid fuel** and can be **stored at a normal temperature**.



One of the options before ISRO is to replace the liquid core **Vikas engine** (L110) engine of the GSLV MK III with a **semi-cryogenic engine** to boost the rocket's payload capacity from four to six tonnes.

### Background story for India's Cryogenic Engine Development

- India developed its **own cryogenic technology** after US led sanctions, invoked under **missile technology control regime** (MTCR an association to stop the proliferation of missiles that could be used for mass destruction) on the Soviet and Indian space agencies, against transfer of cryogenic engines and technology to ISRO in 1991 and later a compromise deal of **selling of seven cryogenic engines** to India was done.
- The Indian scientists conducted the **first successful cryogenic engine test in 2003** and the **first successful test flight with indigenous cryogenic CE7.5 engine** onboard on the third stage of GSLV MK II in 2014.

### After a Long Journey...

A brief history of the Indian cryogenic engine

1982	First team to make engine
1986-91	Early experiments
1991	Russian agreement
1993	Russians back out on technology
1994	Indian cryogenic programme formalised
2000	First engine test (failure)
2003	First successful test
2007	First integration with rocket
2010	First flight
2014	<b>FIRST SUCCESSFUL FLIGHT</b>

### ...India Joins a Small Group

FIRST SUCCESSFUL FLIGHT

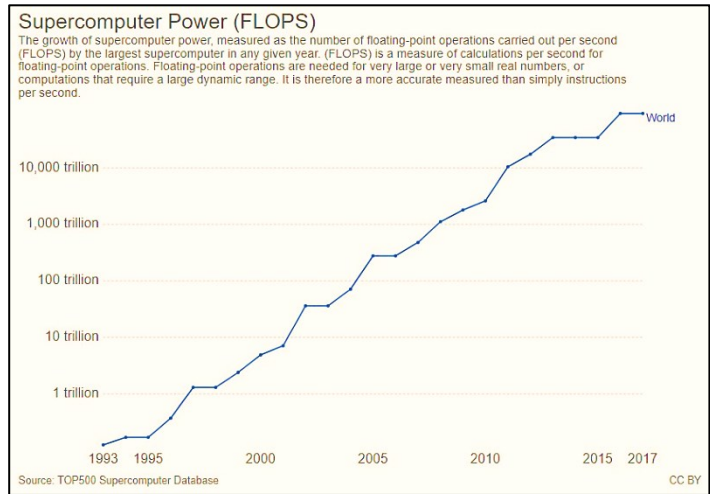
US	1963
Japan	1977
France	1979
China	1984
Russia	1987
<b>India</b>	<b>2014</b>

- **C25 engine** is the most powerful upper stage cryogenic engine operational now, **powering GSLV MK III** (Now LVM3) launch vehicle and **CE7.5 engine** is India's first cryogenic engine, it powers the upper stage of GSLV MK II launch vehicle.

## FASTEST INDIAN SUPERCOMPUTER

**In News:** India is set to dramatically scale up its super-computing prowess by installing an **18-petaflop** supercomputer system this year.

- The **Ministry of Earth Sciences (MoES)** will procure **high-performance computers imported from France** as part of a ₹4,500 crore deal signed in 2018, at the cost of 900 crores to be housed at the IITM, Pune and NCMRWF, Noida.
- These **HPC** will map **weather and climate forecasting** to a resolution of 6 km by 6 km, compared to the current 12 km by 12 km, with the eventual goal of to be able to represent an area by **1 km-square grids** and which can be used to warn of cloudburst and rapidly evolving weather systems.
- Installed at the **Centre for Development of Advanced Computing (C-DAC)** in Pune, Maharashtra, the **AIRAWAT** supercomputer, used in the field of AI, is India's largest and fastest supercomputer with a peak speed of 13 petaflops and is the only Indian machine in the top 100 fastest supercomputers under the Top 500 mission.
- Amongst India's other most powerful computers are **Param Siddhi** (drug research, covid-19, AI), **Pratyush** (weather forecasting) and **Mihir** (weather forecasting) are housed at **C-DAC, Pune, Indian Institute of Tropical Meteorology (IITM), Pune,** and the **National Centre for Medium Range Weather Forecasting (NCMRWF), Noida** respectively.
- India has improved its **short-term weather forecasts** and made **cyclone forecasts** more accurate on the back of such supercomputing machines.



### Computer performance

Name	Unit	Value
kiloFLOPS	kFLOPS	$10^3$
megaFLOPS	MFLOPS	$10^6$
gigaFLOPS	GFLOPS	$10^9$
teraFLOPS	TFLOPS	$10^{12}$
petaFLOPS	PFLOPS	$10^{15}$
exaFLOPS	EFLOPS	$10^{18}$
zettaFLOPS	ZFLOPS	$10^{21}$
yottaFLOPS	YFLOPS	$10^{24}$
ronnaFLOPS	RFLOPS	$10^{27}$
quettaFLOPS	QFLOPS	$10^{30}$

**A petaflop** is a unit of measure for the calculating speed of a computer equal to one quadrillion floating-point operations per second.

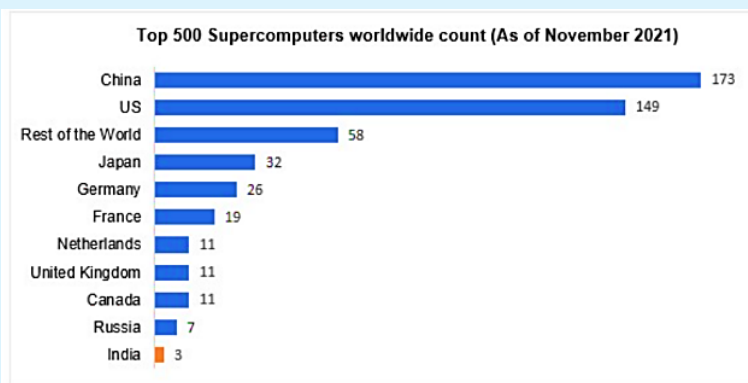
**Flops (floating point operations per second)** are an indicator of computers processing speed and a petaflop refers to a 1,000 trillion flops.

### High Performance Computing (HPC)

- It plays an important role in both scientific advancement and economic **competitiveness** of a nation - making production of **scientific and industrial solutions faster, less expensive, and of higher quality.**
- HPC is a key component in many applications: weather forecasting, designing vehicles and airplanes; designing high-rise buildings and bridges; discovery of drugs; discovery and extraction of new energy sources like oil and natural gas, etc.

## Fastest Supercomputer on Earth!

- The fastest high-performance computing system in the world is currently the **Frontier-Cray system** at Oakridge National Laboratory, United States. This has a **peak speed of 1 exa-flop** (or about 1,000 petaflops).
- The top 10 other systems, based on speed, range from about 400 petaflops to 60 petaflops.
- The ranking of top 500 non-distributed supercomputers is done under the **Top500 project**.



Source: Top 500.org- supercomputer statistics

## National Supercomputing Mission (NSM)

- Envisages empowering our **national academic and R&D institutions** spread over the country by installing a vast supercomputing grid comprising more than **70 high-performance computing facilities**.
- These supercomputers will also be networked on the **National Supercomputing Grid** over the **National Knowledge Network (NKN)**.
- NSM is jointly steered by the **Department of Science and Technology (DST)** and **Department of Electronics and Information Technology (DeitY)**.
- It is implemented by the Centre for Development of Advanced Computing (C-DAC), Pune, and the Indian Institute of Science (IISc), Bengaluru.

### Three phases of NSM:

**Phase I:** Create an ecosystem for assembly of supercomputers in India and install 6 supercomputers with 30% value additions done in India.

**Phase II:** Manufacture supercomputers in the country with an indigenous software stack.

**Phase III:** Focus on design and manufacturing in the country with supercomputing infrastructure total capacity of **45 Petaflops (PF)**. The phase will include three systems of 3 PF each and one system of 20 PF as a national facility.

### Supercomputer Application Areas:

1. **Climate Modelling, Weather Prediction**
2. **Disaster Simulations and Management**
3. **National Security/ Defence Applications**
4. **Aerospace Engineering**
5. **Seismic Analysis**
6. **Discoveries beyond Earth (Astrophysics)**
7. **Material Science and Nanomaterials**
8. **Atomic Energy Simulations**
9. **Cyber Physical Systems**

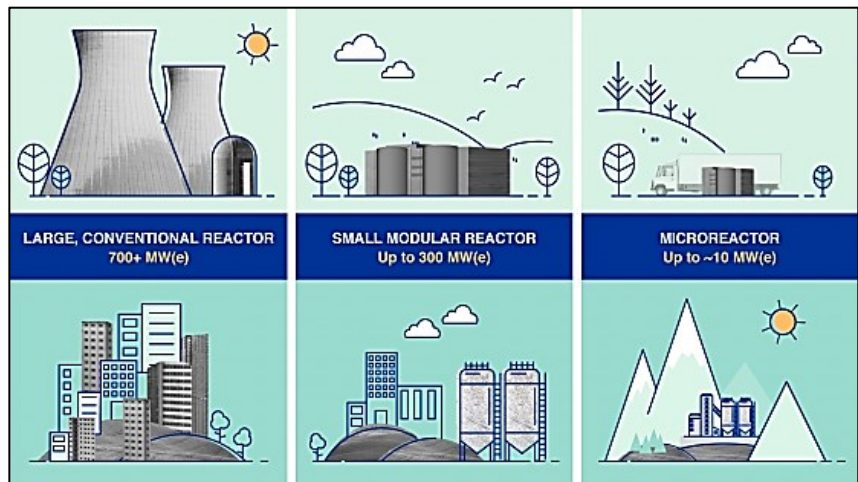


- 10. Big Data Analytics
- 11. Information Repository Management
- 12. Finance
- 13. Computational Chemistry and Biology
- 14. Molecular Dynamics

## SMALL MODULAR REACTOR

**In News:** India is working on new technologies to help make the transition to clean energy using the **Small Modular Reactors (SMRs)** with up to **300 MW capacity**.

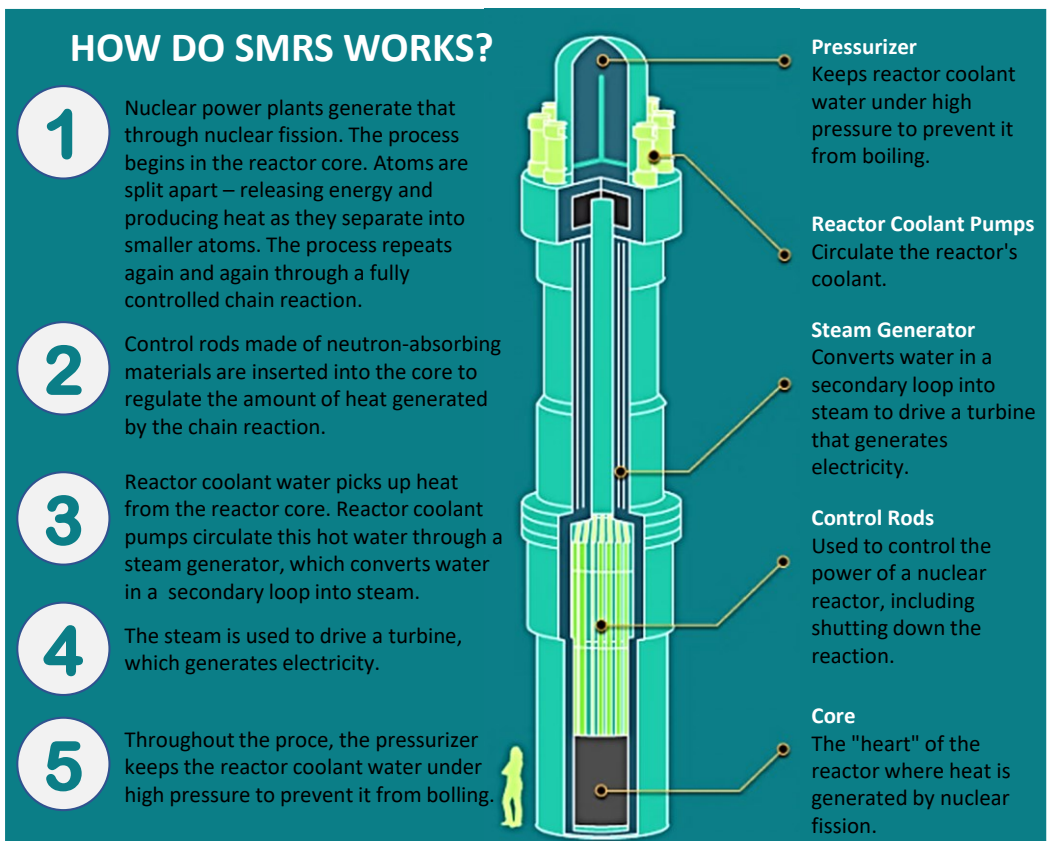
- SMRs being **mobile and agile** technology, require a **smaller footprint** and can be **factory-built**, unlike conventional nuclear reactors that are **built onsite**.
- In 2015, the government amended the Atomic Energy Act and opened up the nuclear power sector to enable **joint ventures** between the **NPCIL** and public sector companies (not for the private sector) to build nuclear power projects.



- India could collaborate with the US to establish the **co-production of SMRs**, leading to reduced costs and improved efficiency.

### **Small Modular Reactors**

- SMRs are **advanced nuclear reactors**, smaller than conventional nuclear reactors, with power generation capacities up to 300 MW(e) per unit.



- They can be built in one location (such as a factory), then shipped, commissioned, and operated at a **separate site**.
- SMRs have emerged as **preferred nuclear energy option** when compared to large reactors.

### Benefits of SMRs

- **Low inventory of nuclear material per reactor**
- **Faster and cheaper construction:** SMRs can be **prefabricated** and standardised, reducing the **time and cost** of building them. They can also be **deployed incrementally** to match the energy demand.
- **Smaller footprint:** Fast realisation, **feasibility of deployment** at difficult sites. SMRs can be sited on locations not suitable for larger plants, such as **remote areas** with **no-grid capacity** or industrial applications that require reliable and continuous power supply.
- **Enhanced safety:** SMRs are generally simpler and safer than large reactors, relying more on **passive systems** and inherent safety features that **do not need human intervention** or external power to shut down in case of an emergency.
- **Flexibility of installation**
- **Base load power in support of renewables:** SMRs are a promising technology in industrial **decarbonization**, especially to complement the renewable energy production.
- **Better waste management:** SMRs require less nuclear material per reactor and produce less radioactive waste than large reactors.

### Challenges of SMRs

- **Licensing and regulation:** SMRs need to meet the same **safety and security standards** as large reactors, but there is no **harmonised regulatory framework** for them yet. Different countries have **different approaches** and requirements for licensing and inspecting SMRs.
- **Proliferation risk:** SMRs may pose a higher risk of **nuclear proliferation** than large reactors, because they use **more enriched uranium** and may be more difficult to monitor and **safeguard and disposal** as spent fuel is **more radioactive**.
- **Public acceptance:** Public opposition due to the **negative perception** of nuclear power after the Chernobyl and Fukushima accidents.
- **Vulnerability of using spent fuel to produce nuclear weapons**

### Status of SMRs

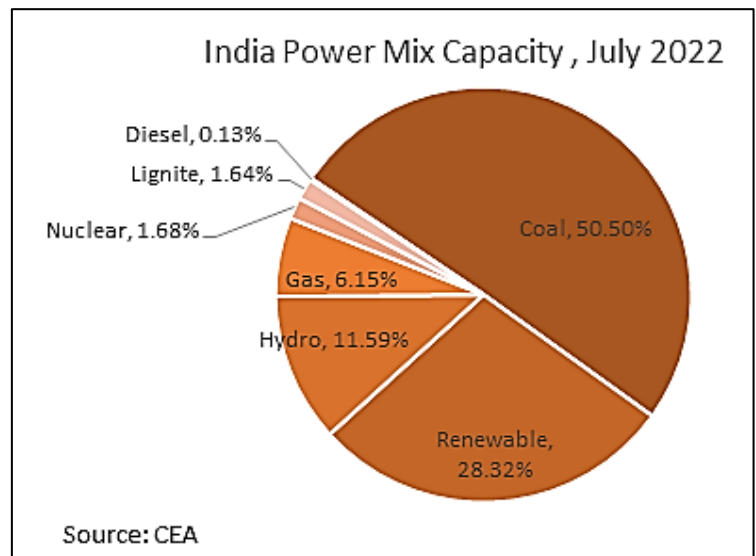
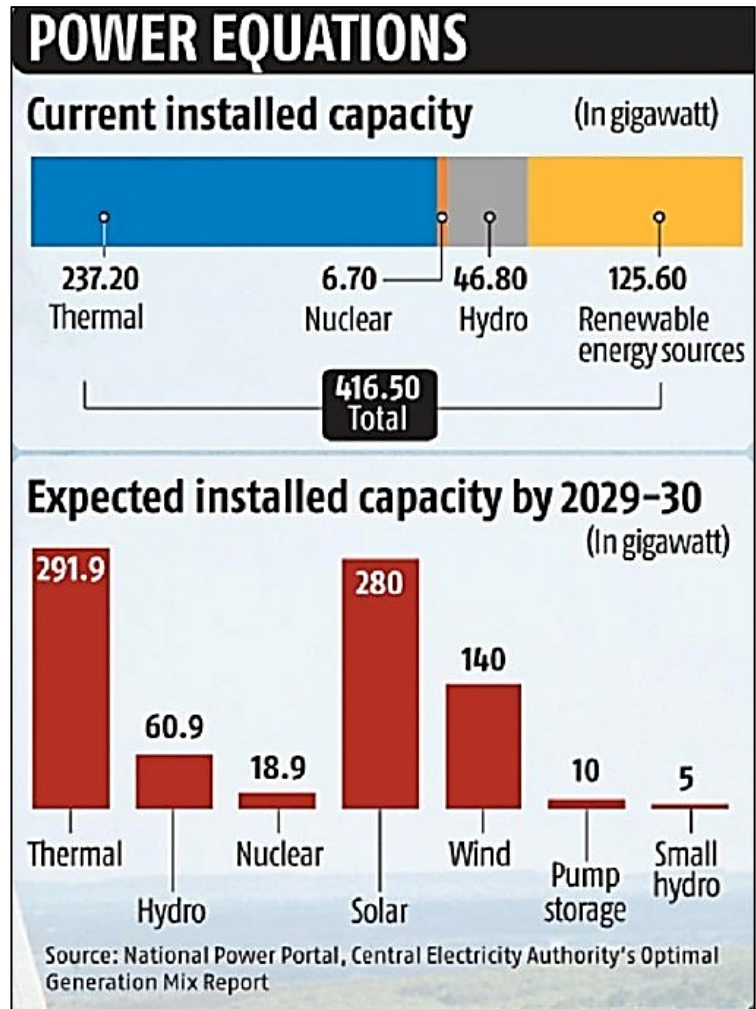
- As of 2023, as many as **80+ SMR designs** were under various stages of research, development and licensing in different countries, and the first SMR units are in operation in **Russia and China**.
- The floating nuclear power plant **Akademik Lomonosov** (operating in Pevek in Russia's Far East) is the first operating prototype in the world.
- China is building the "**Linglong-1**," a small modular reactor (SMR). It's the world's first of its type of reactor to be approved by the International Atomic Energy Agency (IAEA). The first unit of China's pebble-bed modular high-temperature gas-cooled reactor HTR-PM **heating up helium instead of water** to produce power was connected to the grid in 2021.

### India's Nuclear Power Overview:

- India's current installed nuclear power capacity is **6780 MW**, the lowest share in India's energy basket and it plans to add 21 more atomic power generating units with a total installed capacity of **15,700 MW by 2031**.
- India is executing its ambitious **renewable energy plan (wind + solar + small hydro + biomass)** for its energy transition under which **50% of the country's energy needs** would come from non-fossil fuel sources.

### Benefits of Nuclear Power

- The dependence of European nations on **Russian conventional energy** and effects of **non-clean sources on climate change and pollution** have renewed the focus on nuclear power, with advanced and smaller modules.
- Nuclear power can play a big role in the **decarbonization strategy** by providing base load power in support of renewables.
- SMR are better placed to **balance out intermittency** of renewable energy sources as future electricity systems are becoming more solar and wind energy generation sources dominated.
- A big share of **nuclear**, a big share of **renewables, and some storage** is the best mix that is **low-carbon, reliable, and economical**.
- Without nuclear power, demands on the overcapacity of renewables, transmission systems, and energy storage systems, would result in **excessive use of land and resources**.



## NEW OUTER SPACE TREATY

**In News:** The UN, in a policy brief, **For All Humanity- The Future of Outer Space Governance**, has recommended a new treaty to ensure **peace and security in outer space** as well as preventing arms race.

### Issues around Outer Space

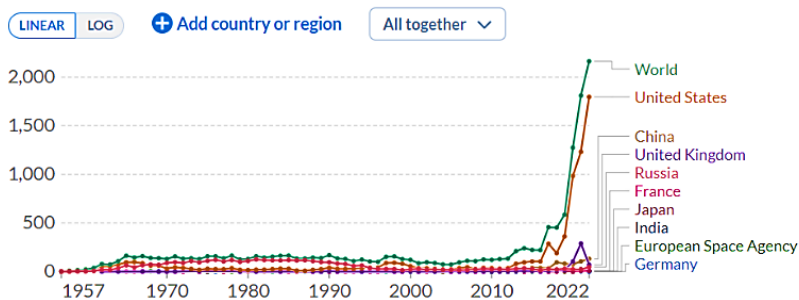
- **Space traffic:** Fuelled by the active participation of the **private sector**, the number of **satellite launches** have shot up exponentially in the past decade.
  - Space traffic is coordinated by national and regional entities, each with its **own standards and practices**. A lack of coordination could impact countries with less space capacity and increase **the risk of collisions**.
- **Space debris:** millions of human-caused space junk particles pose **significant threat** to spacecrafts and other live satellites.
- **Conflict:** Difference in principles on activities in the exploration, exploitation and utilisation of space resources could lead to conflict between nations.
- **Weaponization:** Risks due to **Anti-Satellite (ASAT) Weapons test and proximal manoeuvring** would increase the potential for space debris and compromise **critical civilian infrastructure**.
- As of now, there is **no agreed international framework** on space resource exploration, exploitation and utilisation.

### Potential of Outer Space Exploration

- NASA plans to send humans to the Moon through the **Artemis mission**, marking the return of humans to outer space after more than 50 years.
- **Minerals on the Moon** (rich deposits of helium-3), **asteroids** and **planets** (deposits of valuable metals, including platinum, nickel and cobalt.) can be prove to be bounty of reserves for countries.

### Annual number of objects launched into space

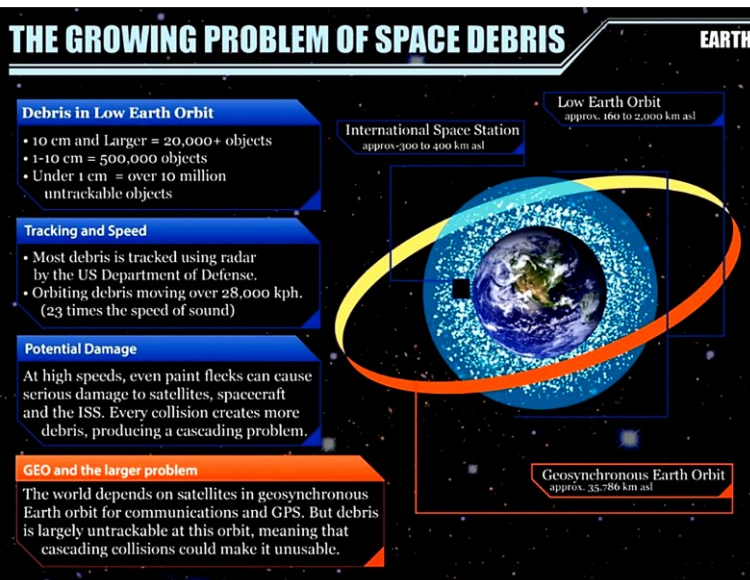
This includes satellites, probes, landers, crewed spacecrafts, and space station flight elements launched into Earth orbit or beyond.



Source: United Nations Office for Outer Space Affairs, Online Index of Objects Launched into Outer Space (2023)

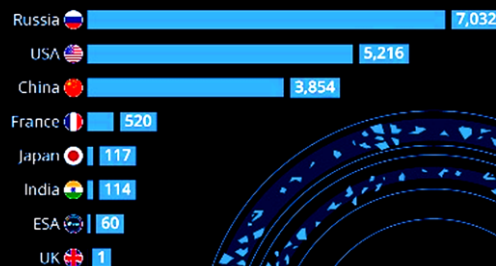
Note: When an object is launched by a country on behalf of another one, it is attributed to the latter.

OurWorldInData.org/space-exploration-satellites • CC BY



### Who's Responsible for Space Junk?

Number of spent rocket bodies and other pieces of debris



\* as of 4 Feb 2022

Source: Orbital Debris Quarterly News, NASA

## Where does space begin?

Due to a **variety of definitions** of where space actually begins, no definitive law confirms the true boundary.

**Outer space starts at 62 miles (100 km),** at the **Kármán line**, for the international community.

The Kármán line is a boundary above mean sea level that borders Earth's atmosphere and the beginning of space.

- However, for NASA, NOAA and the U.S. military, space starts at an altitude of 50 miles (around 80kms).

## Outer space treaty

'Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies' entered in force in Oct 1967.



- The exploration and use of outer space shall be carried out for the **benefit and in the interests of all countries** and shall be the **province of all mankind**
- Outer space shall be **free for exploration** and use by all States
- Outer space is **not subject to national appropriation** by claim of sovereignty, by means of use or occupation, or by any other means
- States shall **not place nuclear weapons** or other **weapons of mass destruction** in orbit or on celestial bodies or station them in outer space in any other manner
- The Moon and other celestial bodies shall be used **exclusively for peaceful purposes**
- **Astronauts** shall be regarded as the **envoys of mankind**
- **States shall be responsible** for national space activities whether carried out by governmental or non-governmental entities
- States shall be **liable for damage** caused by their space objects; and
- States shall **avoid harmful contamination** of space and celestial bodies.

## Recommendations

- **A new treaty:** to be discussed at The Summit of Future, in September, 2023.
- **Binding and non-binding norms:** to address emerging risks to **outer space security, safety** and **sustainability**.
- Coordinating **space situational awareness, space object manoeuvres:** to avoid collisions and ensuring safety.
- **Developing norms** for **space debris removal**
- Framework for **sustainable exploration, exploitation** and **utilisation** of celestial bodies

## Present treaties

- **UN Committee on the Peaceful Uses of Outer Space**, established in 1959.
- **Prohibition of testing nuclear weapons in outer space**, agreed to in 1963, it bans any nuclear explosion in outer space.
- **Prohibition of altering the space environment as a weapon**, agreed in 1977, it prohibits any military or other hostile use of environmental modification techniques having **widespread, long-lasting or severe damaging effects (trioka)**.

## NEURALINK

**In News:** Elon Musk's founded brain-implant company, **Neuralink**, last week received US Food and Drug Administration (FDA) approval to conduct its **first clinical trials** for a **brain-computer interface (BCI) device** in humans that can connect the human mind to machines.



- Neuralink designed a **brain-computer interface (BCI)** called the Link – **an electrode-laden computer chip** that can be sewn into the surface of the brain and connects it to external electronics – as well as a robotic device that implants the chip.
- For decades, research teams around the world have been exploring the use of implants and devices to treat conditions such as **paralysis and depression**.
- However, the technology also raises many **ethical and social questions**, such as the **impact on human identity, privacy, autonomy, and society**.

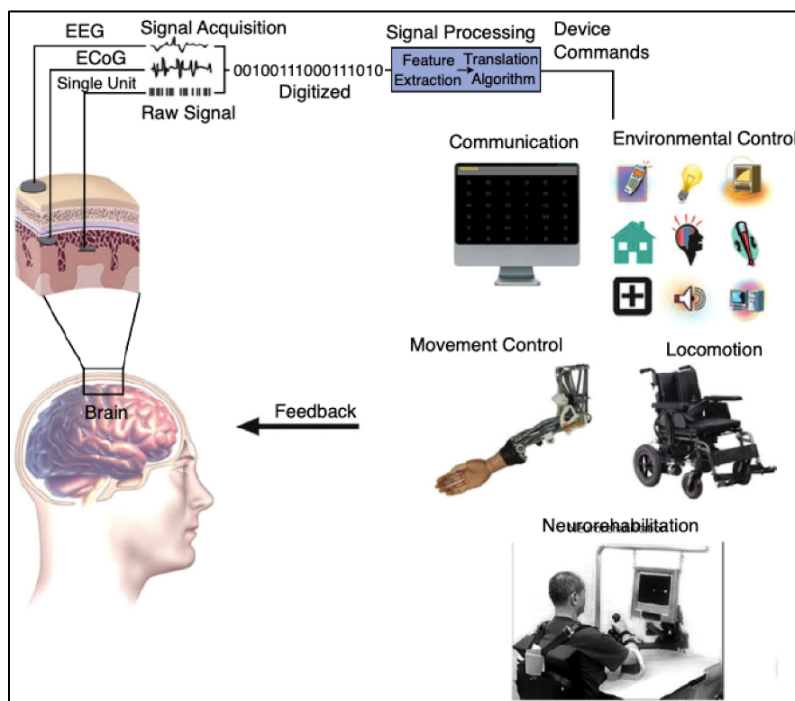
### How does Neuralink work?

**Neurons** in the brain connect with each other to form a large network and communicate using chemical signals called **neurotransmitters**. This reaction generates an electric field, and you can record these reactions by placing electrodes nearby.

Neuralink surgically **implants a BCI device** which has tiny electrodes and a **chipset named N1**, using specially developed robots to carry out quick and precise insertion of device in cortex.

### Neuralink Technology Mission

- Create a **generalised brain interface** to **restore autonomy** to those with unmet medical needs today and **unlock human potential tomorrow**.
- Focused on giving people with quadriplegia (paralysis) the ability to **control their computers and mobile devices with their thoughts**.
- In the future, neuralink hopes to **restore capabilities such as vision, motor function, and speech**, and eventually expand how we experience the world.



### Potential applications of Neuralink's technology:

#### Medical Applications:

- It could help people with **neurological disorders**, such as **paralysis, blindness, deafness, depression, epilepsy, and Alzheimer's disease**, by restoring or enhancing their sensory, motor, or cognitive functions.

- For example, Neuralink could enable paralyzed patients to **control prosthetic limbs or exoskeletons with their thoughts** or allow blind people to see through **artificial vision**.

#### **Enhancement Applications:**

- It could also be used to **augment the abilities of healthy people**, by allowing them to access information, communicate, or interact with machines directly through their brains.
- For example, Neuralink **could enable people to surf the web, play video games**, or learn new skills using their minds.

#### **Symbiosis Applications:**

- Neuralink's ultimate goal is to create a **"general population device"** that can **connect the human mind to artificial intelligence (AI)**.
- For example, Neuralink could allow humans to keep up with the rapid advancement of AI, or even transfer their thoughts and memories to a digital platform.

#### **Challenges of Neuralink's technology**

##### **Safety and Reliability:**

- Neuralink's device involves **invasive surgery**, implanting electrodes into the brain, which carries risks such as infection, bleeding, scarring, leaching chemicals or damage to brain tissue.
- Moreover, the device needs to be safe and reliable in terms of **data transmission, encryption, and battery life**.

##### **Animal Welfare:**

- Neuralink has been accused of **animal cruelty and negligence** in its testing procedures on animals, such as pigs and monkeys. The company has allegedly killed many animals due to aggressive timelines and mistakes or botched operations.

##### **Privacy and Security:**

- Neuralink's device could potentially **access and record sensitive and personal information** from the user's brain, such as thoughts, emotions, memories, or preferences.
- This raises questions about **who owns and controls** this data, how it is stored and shared, and how it is protected from hacking or misuse.

##### **Autonomy and Consent:**

- Neuralink's device could also influence or **manipulate the user's behaviour, preferences**, or decisions, either intentionally or unintentionally.
- This raises questions about how the **user's autonomy and consent** are respected and ensured, especially for vulnerable groups such as children or patients with cognitive impairments.

##### **Data Opacity:**

- The **histology unit** of Neuralink has operated with **data opacity** and there is scant public data as **evidence to proceed with trust**, the human trials and brain implants.

- **Histology:** It is the branch of anatomy that deals with the minute structure of animal and plant tissues as discernible with the microscope.

##### **Identity and Humanity:**

- Neuralink's device could also **alter the user's sense of identity and humanity**, by changing their perception of reality, their relationship with themselves and others, and their role in society.
- This raises questions about **how the user's dignity and values are preserved** and promoted, and how they cope with the **psychological and social implications** of using such a device.

## Conclusion

- Neuralink is a **audacious move and revolutionary technology** that could have a **profound impact** on society. It could offer unprecedented benefits for people with disabilities or diseases, as well as **new opportunities for enhancement or symbiosis**.
- However, it also poses **significant risks and challenges** for the **safety, welfare, privacy, autonomy, identity**, and **humanity** of its **users**. Therefore, it is important to have a **rigorous and transparent scientific evaluation** of its **efficacy** and **safety**, a **robust** and **inclusive ethical** and **social dialogue** about its implications and governance before it is widely used in humans and adopted in society.

## NON-SUGAR SWEETENER (NSS)

**In News:** WHO's latest guidelines advise against using **non-sugar sweeteners** (low or no calorie alternative to free sugar) for weight loss or reducing the risk of **non-communicable diseases**.

### WHO's guidelines regarding NSS

- Long-term use of NSS has been associated with diseases like **type 2 diabetes** and **cardiovascular** diseases in adults.
- NSS does not aid **long-term weight control**; individuals should **choose natural sugars** from fruits or unsweetened options to reduce sugar intake.
- NSS **lack nutritional value**
- Non-sugar sweeteners are **not helpful for people with diabetes**, except for those with pre-existing diabetes.
- The WHO guidelines exclude sugar and sugar derivatives in **personal care and hygiene products** containing non-sugar sweeteners (NSS).
- Common non-sugar sweeteners include **acesulfame K, aspartame, advantame, cyclamates, neotame, saccharin, sucralose, stevia** and **stevia derivatives**.

### Side effects of NSS

- Not effective for **weight loss** strategy.
- **Adverse effect** in long term use.
- Harmful during **childhood or pregnancy**.
- Prolonged use of NSS can lead to **addiction**.

### World Health Organisation (WHO)

- A global health agency responsible for coordinating **international public health** efforts and **promoting health equity** worldwide.
- Currently having 194 member states, it was founded in **1948**, is headquartered at Geneva, Switzerland and is a specialised agency under the United Nations.



### Sugar

- Sugar is the soluble carbohydrate which is used in food, providing a sweetening taste.
- Sugar in moderation is good for health as it is a vital source of energy and fuel for brain functioning.

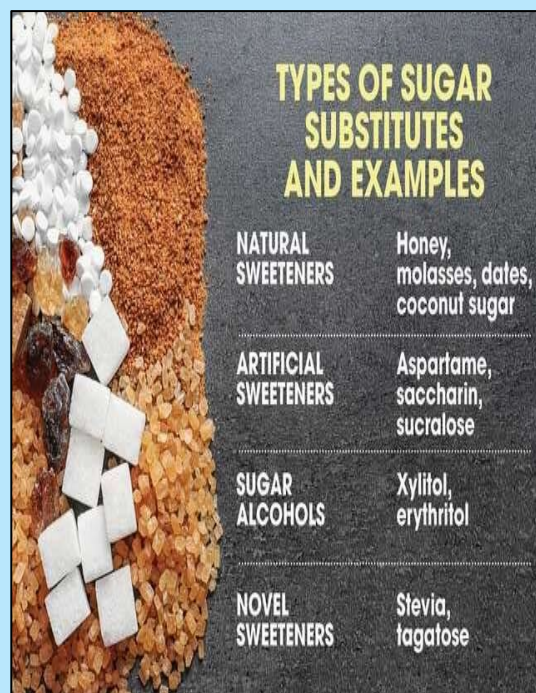


## Types of Sugar

- **Natural Sugar:** Natural sugar is sugar that occurs naturally in foods like fruits, vegetables, and dairy products, without being added during processing.
- **Artificial Sugar:** a substance that has been chemically made to mimic sugar. These are zero calorie sweeteners and are many times sweeter than table sugar.
- **Sugar Alcohols:** Sugar alcohols are low-calorie sweeteners, either naturally occurring or artificial additives.
- **Novel sweeteners:** Plant-derived, non-caloric alternatives to sugar, and are less processed than artificial sweeteners, resembling their natural sources.

### Recommended intake of Sugar

- Not more than **10% of daily energy equivalent**
- Adult men: **37.5g**; Adult women: **25g**



TYPES OF SUGAR SUBSTITUTES AND EXAMPLES	
NATURAL SWEETENERS	Honey, molasses, dates, coconut sugar
ARTIFICIAL SWEETENERS	Aspartame, saccharin, sucralose
SUGAR ALCOHOLS	Xylitol, erythritol
NOVEL SWEETENERS	Stevia, tagatose

## SALT INTAKE

**In News:** Average sodium consumption among Indians is **over twice (11g/day)** the physiological requirement and significantly surpasses the World Health Organization's recommended daily intake.

- The World Health Organization (WHO) recommends a daily salt intake of **less than 5 grams for adults**.
  - The WHO targets to reduce sodium intake by 30% by 2025.

### Impact of Excessive Salt Intake

- Excessive sodium intake leads to **high blood pressure** and contributes to the rise of **hypertension, heart disease and stroke**.
- The Indian economy faces **losses exceeding \$2 trillion** (2012-2030) and low-and middle-income countries (LMICs) **lose 2% of their GDP** due to cardiovascular disease.
- **Circulatory system diseases** cause 32.1% of all deaths, with **hypertension** as a significant risk factor and their **mortality rate** has increased in the past 25 years.

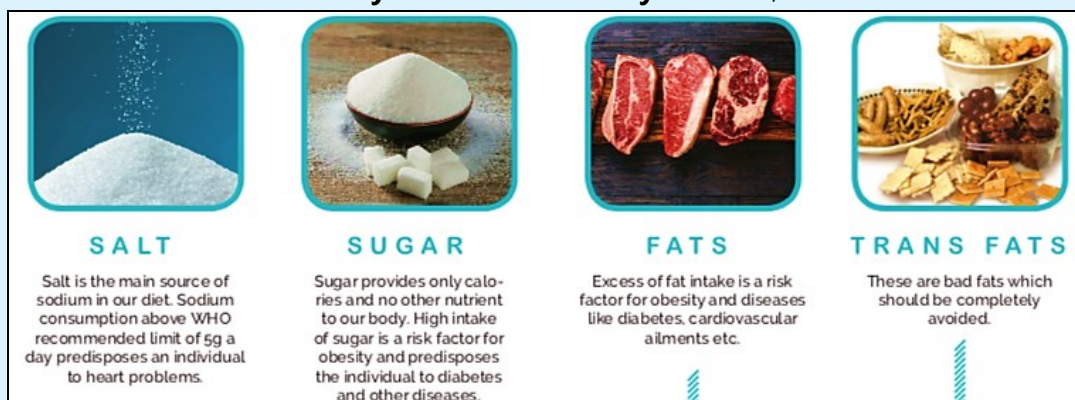
### Initiatives to reduce salt consumption

- **Eat right India movement**
  - To **reduce intake of salt, fat and sugar**.
  - The **Eat Right India** is based on three key themes- Eat **Safe**, Eat **Healthy**, and Eat **Sustainable**.
  - It was launched by **FSSAI**
- **Aaj Se Thoda kam** – A campaign by FSSAI to create awareness.



## Food Safety and Standards Authority of India (FSSAI)

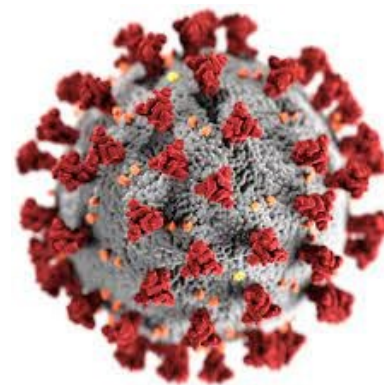
- Sets **global benchmark for food standards** to be followed by **food businesses**.
- FSSAI is an **autonomous statutory body** established under the Food Safety and Standards Act, 2006. It works under the **Ministry of Health & Family Welfare**, Government of India.



## END OF COVID EMERGENCY

**In News:** WHO declared Covid-19 as no longer a **Public Health Emergency of International Concern (PHEIC)**, shifting the focus to long-term management of the infection.

- Covid-19 was a **novel viral infection** that emerged in China in late 2019 and spread rapidly across the world, causing severe health and socio-economic impacts.
- WHO raised its **highest level of alert** through calling it a Public Health Emergency of International Concern in January 2020, a designation that lasted for **over three years**.
- There has been tremendous progress towards understanding Covid-19 through identifying methods of **transmission, high-risk groups, better diagnostics & preparedness, effective treatments & protocols, and vaccines** that can prevent severe disease.
- Thus, WHO removed the designation PHEIC which now results in no lockdowns/containment/control measures, free international travel, opening of restaurants and cinemas.



## Conditions for Declaring a Disease as Public Health Emergency of International Concern (PHEIC)

- **Spreads** across several countries
- Leads to **serious illness**, hospitalisations, and deaths.
- Serious **stress on health systems** because of the disease.
- A PHEIC is the **strongest global alert** the World Health Organization (WHO) (With inputs from WHO's Emergency Committee) can formally make and helps to trigger a set of measures and legally binding obligations that facilitate a coordinated international response.

## Covid-19 in India

In the last 3 years, India **reported 4.43 crore cases and 5.3 lakh deaths** due to Covid-19. Globally, the number of infections has crossed 76.5 crore, and caused 69.2 lakh deaths. Presently in India, more than **90%** of people above the age of 12 years have received their **two primary doses**. Since many were infected and vaccinated, the population has developed a **hybrid immunity** that has been shown to offer better protection against future severe disease.

**World Health Organization (WHO)** is a specialized agency of the United Nations established to further **international cooperation** for **improved public health conditions**. It works towards promotion and attainment of '**the highest possible level of health**' by all people, **epidemic control, quarantine measures, and drug standardization, etc.**

WHO defines health positively as '**a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.**'

Each year WHO celebrates its date of establishment, April 7, 1948, as **World Health Day**.

With its administrative headquarters based in **Geneva**, Switzerland, WHO operates through the **World Health Assembly**, which meets annually as the general policy-making body and an executive board.



## MONKEYPOX

**In News:** The World Health Organization (WHO) has announced that the global outbreak of monkeypox, a rare and infectious disease, is no longer a **public health emergency of international concern (PHEIC)**.

- According to WHO, the virus is still around and further waves and outbreaks could continue, but the highest level of alert is over.
- According to a WHO count, more than 87,000 cases and 140 deaths have been reported from 111 countries during the global outbreak.
- Declaring a **PHEIC** signals that countries need to work together to manage a shared threat, such as a disease outbreak. It also mobilises resources and attention from the international community.

### What is monkeypox (Mpox)?

- Monkeypox is a viral disease caused by the **monkeypox virus** of the **Poxviridae** family, which is a member of the same family of viruses as smallpox.
- Monkeypox can be **transmitted to humans** through physical contact with someone who is infectious, with contaminated materials, or with infected animals.
- **Spread by:**
  - persons, through touch, or intimacy.
  - animals, when hunting, skinning, or cooking them



- materials, such as contaminated sheets, clothes or needles
- pregnant persons, who may pass the virus on to their unborn baby.
- Initial symptoms include **fever**, headaches, swellings, back pain, **aching muscles**. Once the fever breaks, a **rash** can develop, often beginning on the face, then spreading to other parts of the body, most commonly the palms of the hands and soles of the feet.
- The disease can be fatal in some cases, especially among people with **weak immune systems** or other health conditions.
- There are no specific treatments available for the monkeypox infection. However, vaccination against smallpox has been shown to be effective against monkeypox as well.

### From Monkeypox to Mpox

Though Monkeypox was named in 1970 because the virus that causes the disease was first discovered in **captive monkeys in 1958**, the disease does not have much to do with monkeys. The **most likely reservoir** for the virus, which has circulated for several years in a few central African countries after jumping to humans through zoonosis in the bush, **are rodents**.

Last year, the disease spread mainly in USA and Europe, primarily among men who have sex with men (**MSM**), resulting in **marginalisation of the community** that has traditionally been stigmatised for its association with HIV and AIDS.

WHO announced that it would **start using the term “mpox” for monkeypox**. The change of name has been provoked by the **racist connotations** that “monkeypox” sometimes carries.

### IPSN

**In News:** WHO has launched a global network called the '**International Pathogen Surveillance Network (IPSN)**' to detect the threat from **infectious diseases** like Covid-19 and prevent their spread.

- IPSN aims to improve systems for **collecting and analysing samples** of the pathogen, **share information** among the **countries and regions** to prevent the spread of disease.
- It will use **pathogen genomics** to analyse the **genetic code** of viruses, bacteria and other disease-causing organisms and help us understand how **infectious** and deadly they are and how they **spread**.
- The data gathered will feed into a broader **disease surveillance system** to **identify and track diseases, contain outbreaks, and develop treatments and vaccines**.
- The network will have a secretariat within the **WHO's Hub for Pandemic and Epidemic Intelligence**.
- It is the latest of several initiatives launched since COVID-19 to enhance the world's **preparedness and response to pandemic threats** and will bring together experts from governments, academia, and the private sector.
- The **IPSN encompasses 5 areas of work:** standard and harmonized practice, capacity to scale-up surveillance, funding, advocacy, and partnership forum for pathogen genomics.
- Well-functioning **disease surveillance systems**, including **pathogen genomic surveillance**, can save lives and reduce economic losses by reducing the disease burden of infectious diseases.




**Pandemic** is an outbreak of a disease that occurs over a **wide geographic area** and affects an exceptionally **high proportion of the population**. The term is often used to describe the worldwide spread of a new infectious disease, such as COVID-19.

**Epidemic** is an outbreak of a disease that **spreads rapidly** and affects many individuals **within a community or region** at the same time. Epidemics are typically confined to a smaller geographic area than pandemics.

Epidemic disease need not be contagious. For example, certain issues like obesity and health related behaviour like smoking could be endemic in a region.

**Endemic is an** outbreak of a disease when it is **consistently present** but **limited to a particular region**. This makes the disease spread and rates **predictable**. For example, **Malaria** is considered endemic in certain countries and regions.

### What's the difference between an endemic, epidemic and pandemic disease?

Endemic disease	Epidemic disease	Pandemic disease
		
Constantly present in a population or region, with relatively low spread	Sudden increase in cases spreading through a large population	Sudden increase in cases across several countries, continents or the world

## SAKSHAM

**In News:** Govt launches digital learning platform **SAKSHAM (Stimulating Advanced Knowledge for Sustainable Health Management)** developed by the National Institute of Health & Family Welfare (NIHFW) for sustainable health management.

- The learning management information system (LMIS) of the **Ministry of Health & Family Welfare** is a **dedicated and unified platform** for providing **online training and medical education to all health professionals** in the country.
- It will ensure inclusive capacity building of health professionals from **primary health centres located in rural and remote areas** all the way up to **tertiary care and corporate hospitals in metropolitan cities**.
- Currently, SAKSHAM is hosting more than 200 public health and 100 clinical courses through **online mode**. Health professionals can register themselves for these courses on the portal and get the certification after undergoing requisite training and qualifying the required assessment criteria.
- The portal will host theme based customised **courses developed in collaboration with global healthcare agencies** like WHO, UNICEF, UNDP, and reputed national/international institutes.

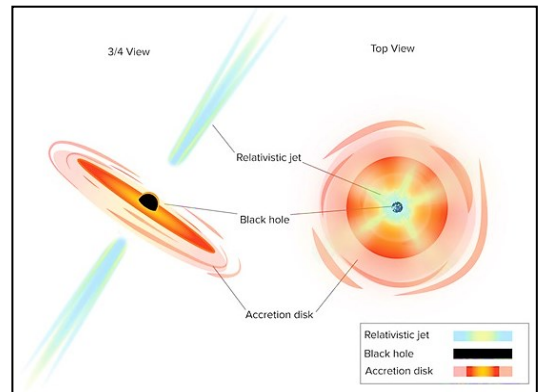
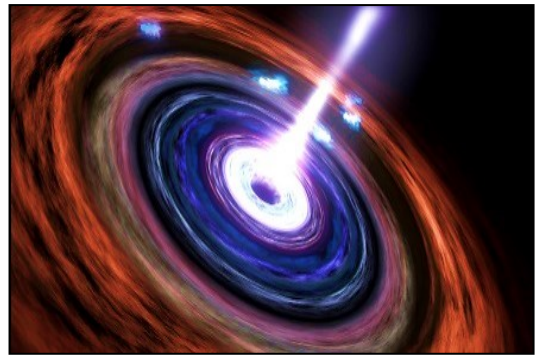


## BLAZAR

**In News:** The **Indian Astronomical Observatory (IAO)** located in **Hanle, Ladakh**, has joined hands with 10 other global telescopes to observe the brightening of **BL Lacertae (BL Lac)**, a **blazar** located about **950 million light years** away from Earth.

- A blazar is a **type of active galactic nucleus** that is powered by a humongous **black hole** and is among one of the **brightest and most powerful objects** in the universe.

- Usually located at the core of the galaxy, active galactic nucleus are compact structures showing **anomalous luminosity from time to time**.
- They are known for **emitting highly energetic particles** and radiation, including **gamma rays, X-rays, and radio waves**.
- The IAO is one of the **world's highest observatories**, situated at an altitude of 14800 feet. It is operated by the **Indian Institute of Astrophysics (IIA), Bengaluru**. It has three major telescopes: **Himalayan Chandra Telescope (HCT), GROWTH-India Telescope, and High Altitude Gamma Ray Telescope (HAGAR)**.
- The IAO is also set to become **India's first dark sky reserve**. A dark sky reserve is a designated area that has **minimal light pollution**, possesses an **exceptional quality of starry nights** and **preserves the natural darkness** of the night sky for scientific, educational, or cultural purposes.



**Blazar:** A type of **active galactic nucleus (AGN)** that emits a jet of ionised particles that is aligned with the observer's line of sight.

**Black hole:** A region of space where gravity is so strong that nothing, not even light, can escape.

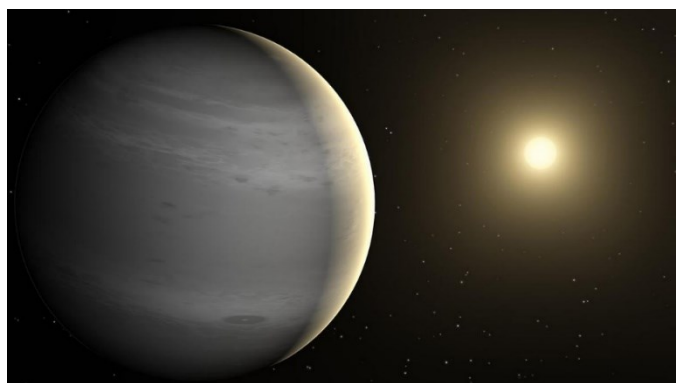
**Gamma ray:** A type of electromagnetic radiation with very high energy and frequency, often produced by nuclear reactions or cosmic phenomena.

**Light years:** A unit of distance equal to how far light travels in a vacuum in one year, which is approx. 9.46 trillion kilometres. Light years are used to express distances to stars and galaxies, as well as the size of the observable universe.

## EXOPLANET

**In News:** Indian scientists discover an **exoplanet** named TOI 4603b or HD 245134b that is 13 times more massive than Jupiter.

- An international team of scientists led by an Indian Professor at the **Exoplanet Research Group** of the **Physical Research Laboratory (PRL)**, Ahmedabad, **discovered an exoplanet** that is **13 times** more massive than **Jupiter** and has the highest density known so far.
- This is India's third exoplanet discovery made by PRL scientists with PARAS spectrograph and the PRL 1.2m telescope.
- The exoplanet was detected using the **PRL Advanced Radial-velocity Abu-sky Search spectrograph (PARAS)** at the 1.2 m telescope of PRL at its **Gurushikhar Observatory** in **Mt. Abu**.



- The exoplanet orbits a subgiant F-type star TOI4603 every 7.24 days at a distance less than one-tenth the length of space between the Sun and Earth. It is tidally locked to its star.
- The exoplanet falls into the transition mass range of **massive giant planets** and **low-mass brown dwarfs** with masses ranging from 11 to 16 times the mass of Jupiter.
- Most exoplanets are found through indirect methods: measuring the **dimming of a star** that happens to have a planet pass in front of it, called the **transit method**, or monitoring the spectrum of a star for the tell-tale signs of a planet pulling on its star and causing its light to subtly **Doppler shift**.
- Studying exoplanets helps us understand the **formation, evolution, and diversity** of **planetary systems** in the universe.
- Exoplanets also offer a chance to **search for life beyond Earth**, which could have profound implications for our place in the cosmos.

**Exoplanet:** An exoplanet is any **planet beyond our solar system**. Most exoplanets orbit other stars, but free-floating exoplanets, called **rogue planets**, orbit the galactic center and are untethered to any star.

- More than 5,000 exoplanets have been confirmed so far, and many more are candidates.
- They are made up of elements similar to those of the planets in our solar system.
- Scientists think some may have **habitable zones** where liquid water could exist on the surface.

**Brown dwarfs** are substellar objects that are not massive enough to sustain hydrogen fusion in their cores, unlike stars, but are more massive than planets.

**Spectrograph:** An instrument that splits light into its component wavelengths and records the resulting spectrum.

**Doppler shift:** The change in the frequency or wavelength of a wave due to the relative motion of the source and the observer. For example, the sound of a siren becomes higher as it approaches an observer and lower as it moves away. The doppler shift can be used to measure the speed and direction of a moving object, such as a planet orbiting a star.

**Transit method:** A technique for detecting exoplanets by measuring the slight dimming of a star's brightness when a planet passes in front of it. The transit method can reveal information about the size, orbit, and atmosphere of the planet.

## SUN HALO

**In News:** People in Prayagraj and surrounding areas witnessed a **rare celestial event (Sun Halo)** as a mysterious ring enveloped the sun in the skies.

- A **sun halo** is an **optical phenomenon** that occurs when sunlight interacts with **ice crystals** in the atmosphere, creating a **multi-colored ring** which appears like a halo or a **rainbow** circling the sun.
- The rare event is the result of the delicate dance of light and optics coming together with the icy particles in the clouds and is the result of a process called **dispersion of light** caused due to refraction/reflection.



### What causes a sun halo?

- Sunlight interacts with unique millions of **hexagonal ice crystal** (called as diamond dust) found in the thin veil of **cirrus clouds**, suspended in the atmosphere.
- When sunlight enters these ice crystals, it is **refracted**, or bent on both entry and exit, by the ice crystal's surfaces.
- This **bending of light** causes the sun's rays to separate into their component colours, creating a **spectrum** of colours that are visible as the halo. The **prism effect** is such that the rainbow colours go from **red** on the inside to **violet** on the outside.
- The bending of light depends on the ice crystal's diameter and the angle of incidence.
- The ring is formed by a 22-degree angle between the incoming and outgoing rays of light and hence is called **22-degree-ring halo**.

### What are the conditions for a sun halo to form?

- Ice crystals must be **oriented** and positioned in a particular way, with their **flat surfaces parallel to the ground** which ensures that the light is refracted at the same angle for all crystals.
- The sky must be **clear and bright** which allows the contrast between the halo and the background to be visible. Clouds, haze, or pollution can obscure or diminish the halo effect.
- Atmospheric optical phenomena like halos were used as part of weather lore, which was an empirical means of **weather forecasting** before meteorology was developed. They often indicate that **rain would fall within the next 24 hours**, since the **cirrostratus clouds** that cause them could signify an **approaching frontal system**.
- Sun halos are similar to other optical phenomena such as **rainbows and moon halos**, which are also caused by **refraction and dispersion of light** by water or ice particles in the atmosphere

**Optical phenomenon:** A phenomenon that involves the interaction of light with matter.

**Dispersion of light:** The process of splitting white light into its component colours.

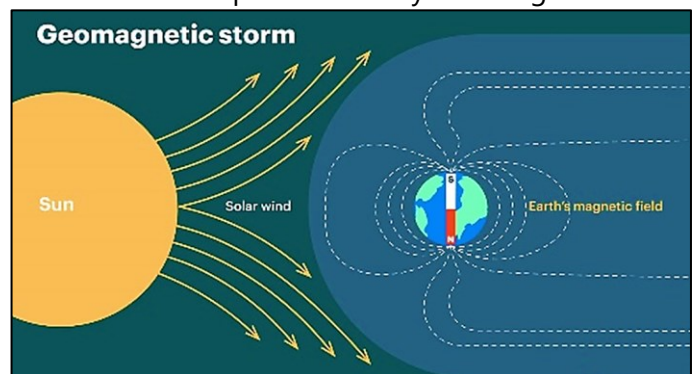
**Refraction of light:** The bending of light as it passes from one medium to another.

**Cirrus cloud:** A type of cloud that is thin, high, detached, hair like clouds and composed of ice crystals. These clouds are formed very high up in the atmosphere, at a height of over 20,000 feet.

## RARE AURORA LIGHTS

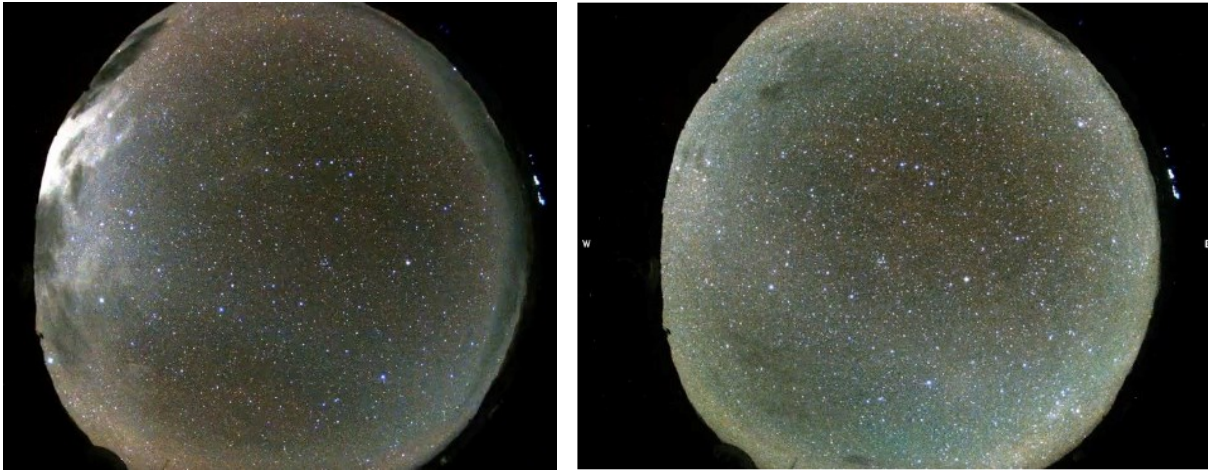
**In News:** Indian Institute of Astrophysics (IIA) shared a time-lapse of the sky showing an aurora witnessed from Hanle in Ladakh.

- **Aurora borealis or Northern lights** which are usually seen in **polar regions** were captured in Ladakh. The clip captures rapidly changing **green and blue lights** witnessed in the sky.
- Also called as the **greatest light show** on earth, it is extremely rare and unpredictable to see aurora at such a **low latitude of 34-36 degree North**.
- The aurora was seen due to an **intense geomagnetic storm** that hit the Earth, caused by **coronal mass ejections (CMEs)** from the Sun.





- CMEs are **large expulsions of plasma and magnetic fields** from the Sun's corona that disturb the Earth's magnetic field and enable us to see the aurora lights.
- The aurora lights are like **colourful curtains of charged particles** moving into space at ultra-high speeds and colliding with atoms and molecules in the Earth's atmosphere.
- The aurora seen in Ladakh was a rare event, as it was a **stable auroral red (SAR) arc**, which is a band of light that is **static and monochromatic**.
- The aurora is usually seen in polar regions, where the Earth's **magnetic field lines are more vertical** and **allow more charged particles to enter the atmosphere**.



### Solar Storms

- **Solar storms** are disturbances in the Sun's magnetic field that can release large amounts of energy or big blobs of plasma into space in the form of **charged particles and electromagnetic radiation**.
- The Sun has an **11-year magnetic cycle** that produces more sunspots and energy, at its peak of cycle, known as **solar maximum**.
- The Sun's **magnetic poles flip** during solar maximum, causing solar eruptions of plasma (charged particles and electromagnetic radiation) with their own magnetic fields.
- There could be **frequent aurora sightings** due to approach around solar maximum.
- The most common types of solar storms include **solar flares, coronal mass ejections (CMEs), and high-speed solar wind streams**.
- These eruptions, also known as **solar storms or coronal mass ejections (CMEs)**, travel through space and sometimes collide with the Earth's magnetic field, creating a **geomagnetic storm**.
- The geomagnetic storm causes the charged particles to interact with the Earth's atmosphere, creating **colourful polar lights (auroras)**.
- The geomagnetic storm can also cause other effects on the Earth, such as:
  - **Power outages** due to damage to electrical grids
  - **Satellite and communication disruptions** due to interference with signals
  - **Radiation exposure** for astronauts and high-altitude flyers
  - Increased risk of **space debris** due to drag on low-orbiting objects

## SECOND DEEPEST BLUE HOLE

**In News:** The **second-deepest blue hole** in the world, named **Taam Ja**, meaning deep water, about **900 feet deep**, has been discovered in **Chetumal Bay off the coast of the Yucatan Peninsula in Mexico**.

- A blue hole is a **massive underwater sinkhole or the underwater cavern** that is formed by the **erosion of limestone terrains** and subsequent **filling up of caverns with water** due to sea level rise during the ice age,s around 11,000 years ago.
- When **seawater meets limestone**, water easily permeates the **rocks** since they are so **porous**. This enables chemicals in the water to react with **limestone**, eating it away. Once glaciers melt and seawater rise over time, water rushes into these caverns and fills them up, creating these **sinkholes**.
- Blue holes have indigo centres and light blue perimeters and are **ecological hotspots** with **low-oxygen (hypoxic) and stratified environments** and **diverse microbial life** that can reveal ancient fossils and extinct species.
- Blue holes can provide insights into **ancient Earth conditions** and possible life on **other planets**.
- The world's deepest known blue hole '**the Dragon Hole**' in the South China Sea was discovered in 2016 and is thought to be more than **980 feet (300 m) deep**.



## THERMOBARIC WEAPONS

**In News:** Myanmar has been accused of using disproportionate force on its civilian crowd by using thermobaric weapons against the rebel and protesting groups.

- Thermobarics, also known as **"vacuum bombs or aerosol bombs or fuel air explosive,"** suck up the oxygen in their explosive range to mix with fuel, massively increasing their **explosive power, flammability, and antipersonnel effects**.
- Thermobaric bombs are **much more devastating** than conventional explosives of similar size, there is nowhere to hide when it's dropped on a unit; **buildings, foxholes, and even bunkers can be destroyed** by its power.
- Thermobaric weapons **kill by using a pressure wave of fuel that mixes with atmospheric oxygen**, a second explosive charge **detonates/ignites the cloud of fuel and air**, creating a **massive firewall, blast wave and vacuum** that will rupture the lungs and can crush reinforced concrete buildings and destroy inside armoured vehicles.

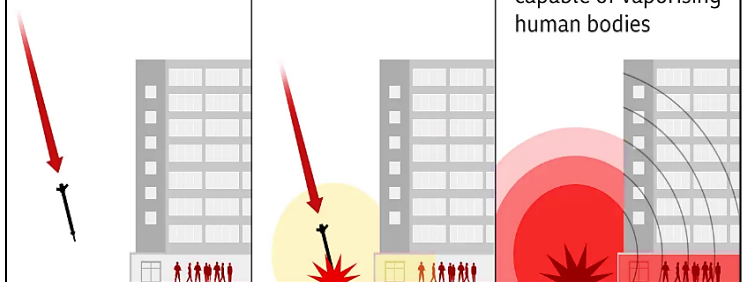


### How thermobaric weapons work

1. Precision-guided bomb strikes target

2. Small explosion releases a cloud of explosive material

3. Second explosion ignites cloud, causing a massive blast that is capable of vaporising human bodies



- The main damage is caused due to **thermobaric (temperature and pressure) effect** of the blasts.
- Thermobaric munitions can be traced back to WWII, US also used them during Vietnam and Afghanistan war, while Russia used them during Chechnya war and current Russia-Ukraine war.

## TITAN IMPLOSION

**In News:** OceanGate's Titanic Survey Expedition **submersible named Titan** went on an expedition to **explore the wreckage of the sunken Titanic off the coast of Newfoundland** but two hours later it lost the communication.



- It was designated as a multi-year project that aimed to document and preserve the historic site of the **Titanic shipwreck** using sonar, laser, and video technology.
- A remote-controlled underwater search vehicle (ROV) found pieces of debris on the ocean floor that belonged to the Titan submersible, approximately 488 meters away from the sunken Titanic on the ocean floor.
- The debris found indicates **a catastrophic implosion** of the vessel, resulting in the death of all 5 explorers. Implosion is a process of **destruction by collapsing inwards**. Where **explosion expands, implosion contracts**. In the case of the Titan Submersible, the implosion was caused due to **very high hydrostatic pressure** of the surrounding water.
- The Titan was 5-person submersible made of **carbon fiber and titanium** materials thought to withstand the pressure at depths of up to 4,000 meters.
- The craft's hull was designed to protect the crew from the water pressure. The water pressure 3,800 meters down at the site of the Titanic wreck is roughly 400 atmospheres (6,000 PSI), about the same as **having 35 elephants on one's shoulders**.
- Deep-sea vehicles typically utilise durable metals like titanium and carbon fibre for its exceptional strength to construct their pressure vessels.
- These vessels are designed in a spherical shape to **distribute the immense pressure evenly** within the passenger compartment. In order to accommodate more individuals, the OceanGate submersible opted for a **cylindrical design**.
- Operating a submersible in the deep ocean is **not an easy task** as there is **immense water pressure, low temperature and limited visibility** that affect the performance of batteries and can hinder navigation and communication. The **unpredictable currents** can affect stability and manoeuvrability as well.



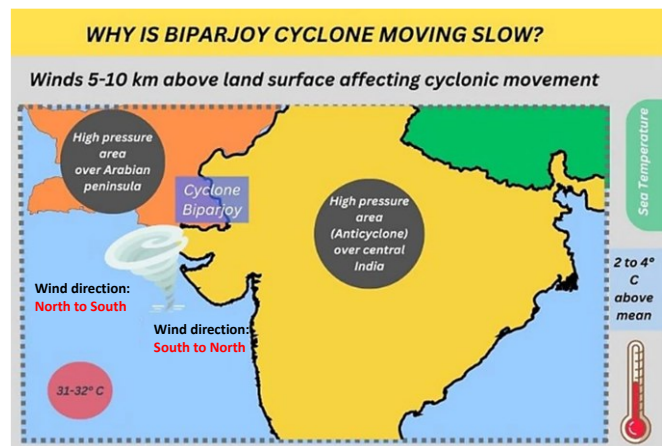
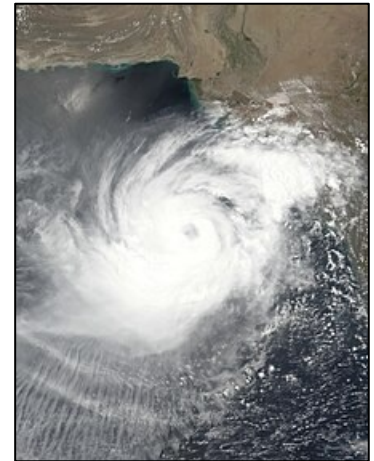


# GEOGRAPHY, ENVIRONMENT & DISASTER MANAGEMENT

## CYCLONE BIPARJOY

**In News:** Cyclone Biparjoy, a powerful long lasting tropical cyclone that formed over the **east-central Arabian Sea** made landfall near the **Jakhau Port, Kutch** near India-Pakistan border.

- A low-pressure area over the Arabian Sea, caused by cyclonic circulation, gradually **intensified into depression, deep depression, and finally Cyclone Biparjoy**, the first severe cyclone of the 2023 North Indian Ocean cyclone season.
- It was **named 'Biparjoy'** as suggested by Bangladesh and the word means **'disaster' or 'calamity'** in Bengali, based on an agreed cyclone naming convention.
- For **10 days**, Cyclone Biparjoy lingered over the moist and hot eastern Arabian Sea, **drifting slowly** towards the north before changing direction to the east, influenced by factors such as **humidity, heat content, and rotational power** that affect cyclone intensity.
- The **slow speed of 5-7 kmph** was a result of getting trapped between **two anticyclonic systems** of high pressure. One of them helped it move northwards, while the other was holding it back. This unique feature made **Biparjoy's trajectory unpredictable**.
- Biparjoy hit parts of Gujarat and Rajasthan in India and Sindh in Pakistan with heavy rainfalls, strong winds and storm surge and caused **widespread damage to infrastructure, agriculture, livestock** and human lives in the affected areas.
- The **landfall of Biparjoy took approx. 5 hours** (more than usual), which made the cyclone gain energy for longer duration at the coast.



**Landfall:** As per the IMD, a tropical cyclone is said to have made a landfall when the **centre of the storm, or its eye, moves over the coast**.

- More time spent at landfall is indicative of **higher intensity** of cyclone and possibility of **greater destruction**.
- The Arabian Sea has been experiencing **higher sea surface temperatures and ocean heat content** due to climate change. It results in higher **Accumulated Cyclone Energy (ACE)**.
- The sea surface temperature during the formation of Biparjoy was **31-32 degree Celsius**, 3-4 degree above the minimum requirement.

## What is a Cyclone

- A cyclone is a **large-scale system** of air that rotates around the centre of a **low-pressure area**.
- A cyclone is characterised by **inward spiralling winds** that rotate **anticlockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere** due to Coriolis force.
- Cyclones have two types: extratropical cyclones and tropical cyclones.
  - **Extratropical cyclones:** Also known as mid-latitude cyclones, occur outside of the tropic, have cold air at their core, and derive their energy from the release of potential energy when **cold and warm air masses interact**.
  - **Tropical cyclones:** develop in the regions between the Tropics of Capricorn and Cancer, a rotating, organised system of clouds and thunderstorms that originates over tropical or subtropical waters and has closed, low-level circulation.
  - Tropical Cyclones, also known as **hurricanes** in the North Atlantic and **typhoons** in the north-west Pacific, are a regular and deadly phenomenon in the Indian Ocean.



India Meteorological Department Tropical Cyclone Intensity Scale	
Category	Sustained winds (3-min average)
Super Cyclonic Storm	≥120 kt ≥221 km/h
Extremely Severe Cyclonic Storm	90–119 kt 166–220 km/h
Very Severe Cyclonic Storm	64–89 kt 118–165 km/h
Severe Cyclonic Storm	48–63 kt 89–117 km/h
Cyclonic Storm	34–47 kt 63–88 km/h
Deep Depression	28–33 kt 51–62 km/h
Depression	17–27 kt 31–50 km/h

## How Tropical Cyclones are Formed

- A cyclone is formed when the **warm, moist air rises upward** over the ocean.
- As this air moves up, there is a formation of a **low-pressure area below**.
- The low-pressure area is filled with the high-pressure air from the surroundings.
- Again, the **next batch** of cool air gets warm and moist over the ocean moving upward.
- This **continuous cycle** results in the formation of clouds in the air.
- As the warm air continues to rise, the **surrounding air swirls in** to take its place.
- This leads to the formation of the **storm system**.
- Depending on the strength of the winds produced, the cyclones are divided into **different classes**.

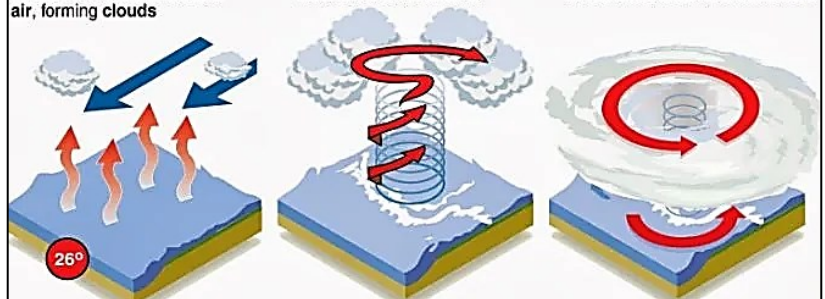
### How tropical storms are formed

High humidity and ocean temperatures of over 26°C are major contributing factors

Water evaporates from the ocean surface and comes into contact with a mass of cold air, forming clouds

A column of low pressure develops at the centre. Winds form around the column

As pressure in the central column (the eye) weakens, the speed of the wind around it increases



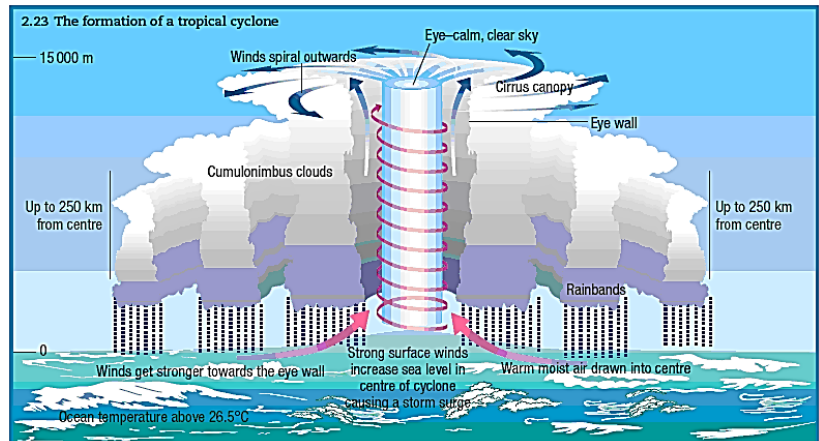
## How Cyclones Get Energy

- Cyclones get energy from the **heat released when water vapour condenses** into liquid water droplets in the clouds.
- This process **releases latent heat**, which warms the air and makes it rise faster.

- The rising air creates a lower pressure and leads to drawing of more air and moisture from the ocean surface.
- This **cycle of evaporation and condensation fuels** the cyclone and makes it stronger.
- Cyclones **lose their intensity** once they move over land because of **sharp reduction of moisture supply** and increase in surface friction.

### Cyclone structure

- A cyclone has a well-defined structure that consists of **an eye, an eyewall and spiral rainbands**.
- The **eye** is a calm and clear area at the centre of the storm, where air sinks down from above.
- The **eyewall** is a ring of dense clouds that surrounds the eye, where the strongest winds and heaviest rains occur.
- The **spiral rainbands** are bands of clouds that extend outward from the eyewall, where moderate to heavy rains and gusty winds occur.



### What is Brown Ocean Effect

- Brown ocean effect is a phenomenon where a tropical cyclone **maintains or intensifies its strength over land** instead of weakening, as expected.
- This happens when the **land surface is moist and warm** enough to provide evaporation and latent heat release similar to that over the ocean.
- This can occur in regions with **wetlands, swamps, irrigated fields or heavy rainfall**.
- This can **prolong the impact and damage** of a cyclone over land areas far from the coast.

### How Cyclones Get their Names

- The naming of the tropical cyclones over north Indian Ocean commenced from September 2004, with names provided by a total **13 Members**.
- The practice of **naming tropical cyclones** began in order to help in the quick identification of storms in warning messages because names are presumed to be far easier to remember than numbers and technical terms.

The RSMC New Delhi Tropical Cyclone Center is responsible to name the tropical cyclones that have formed over the Bay of Bengal and the Arabian Sea when they have reached the relevant intensity.

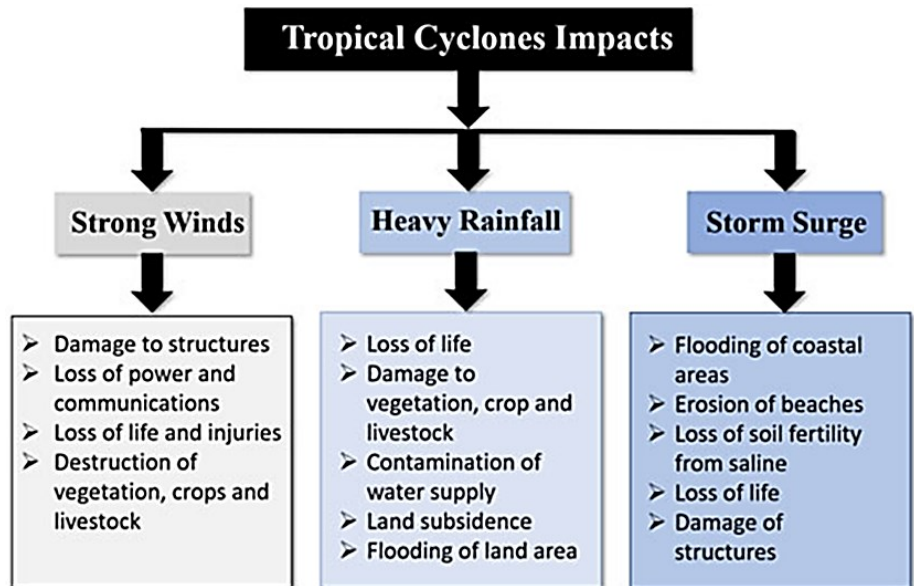
The names to be used will be taken from the list below, starting with Nisarga, then Gati, Nivar, etc.

WMO/ESCAP Panel Member countries	Column 1		Column 2		Column 3		Column 4	
	Name	Pron'	Name	Pron'	Name	Pron'	Name	Pron'
Bangladesh	Nisarga	Nisarga	Biparjoy	Biporjoy	Arnab	Ornab	Upakul	Upokul
India	Gati	Gati	Tej	Tej	Murasu	Murasu	Aag	Aag
Iran	Nivar	Nivar	Hamoon	Hamoon	Akvan	Akvan	Sepand	Sepand
Maldives	Burevi	Burevi	Midhili	Midhili	Kaani	Kaani	Odi	Odi
Myanmar	Tauktae	Tau'Te	Michaung	Migjaum	Ngamann	Ngaman	Kyarhit	Kjathi
Oman	Yaas	Yass	Remal	Re-Mal	Sail	Sail	Naseem	Naseem
Pakistan	Gulab	Gul-Aab	Asna	AS-Na	Sahab	Sa-Hab	Afshan	Af-Shan
Qatar	Shaheen	Shaheen	Dana	Dana	Lulu	Lulu	Mouj	Mouj
Saudi Arabia	Jawad	Jowad	Fengal	Feinjal	Ghazeer	Razeer	Asif	Aasif
Sri Lanka	Asani	Asani	Shakhti	Shakhti	Gigum	Gigum	Gagana	Gagana
Thailand	Sitrang	Si-Trang	Montha	Mon-Tha	Thianyot	Thian-Yot	Bulan	Bu-Lan
United Arab Emirates	Mandous	Man-Dous	Senyar	Sen-Yaar	Afoor	Aa-Foor	Nahhaam	Nah-Haam
Yemen	Mocha	Mokha	Ditwah	Ditwah	Diksam	Diksam	Sira	Sira

- The **RSMC New Delhi Tropical Cyclone Center** is responsible for naming the tropical cyclones that have formed over the Bay of Bengal and the Arabian Sea when they have reached the relevant intensity.

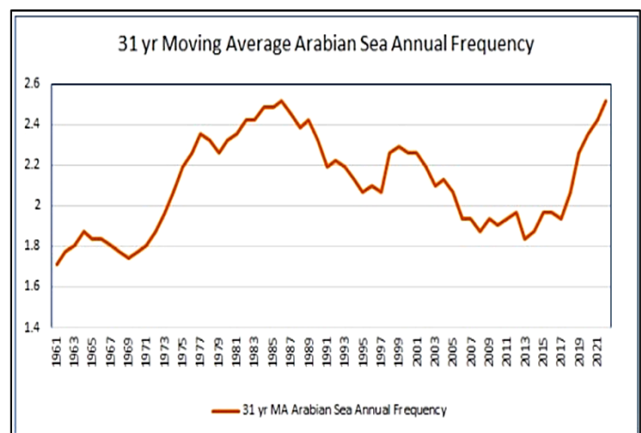
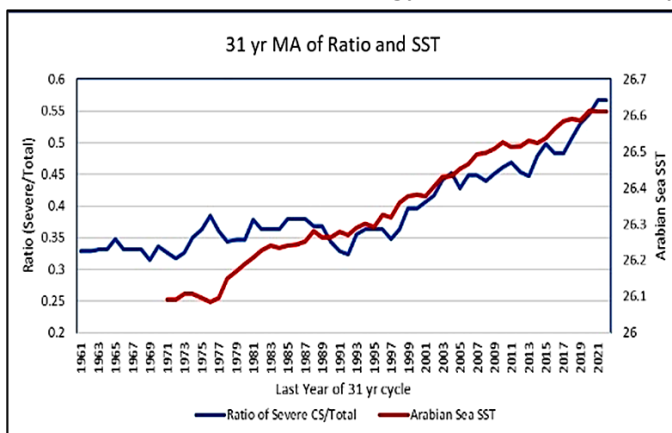
### Cyclones Destructive Impact

- Cyclones can cause severe damage and disruption to coastal and inland areas by their **strong winds, heavy rains, storm surges, flooding and landslides**.
- Strong winds can **uproot trees, topple power poles, damage roofs, windows, and vehicles, and create flying debris**.
- Heavy rains can cause **flash floods, river floods, urban floods and soil erosion**.
- Storm surges are abnormal rises of sea water that can **inundate low-lying coastal areas, erode beaches, cause coastal flooding floods, damage to coastal structures** and **salinize agricultural land**.
- Flooding and landslides can block roads, bridges and railways, disrupt water supply and sanitation, damage crops and livestock, and trigger epidemic.



### Why Arabian Sea is Seeing Increased Frequency of Tropical Cyclones

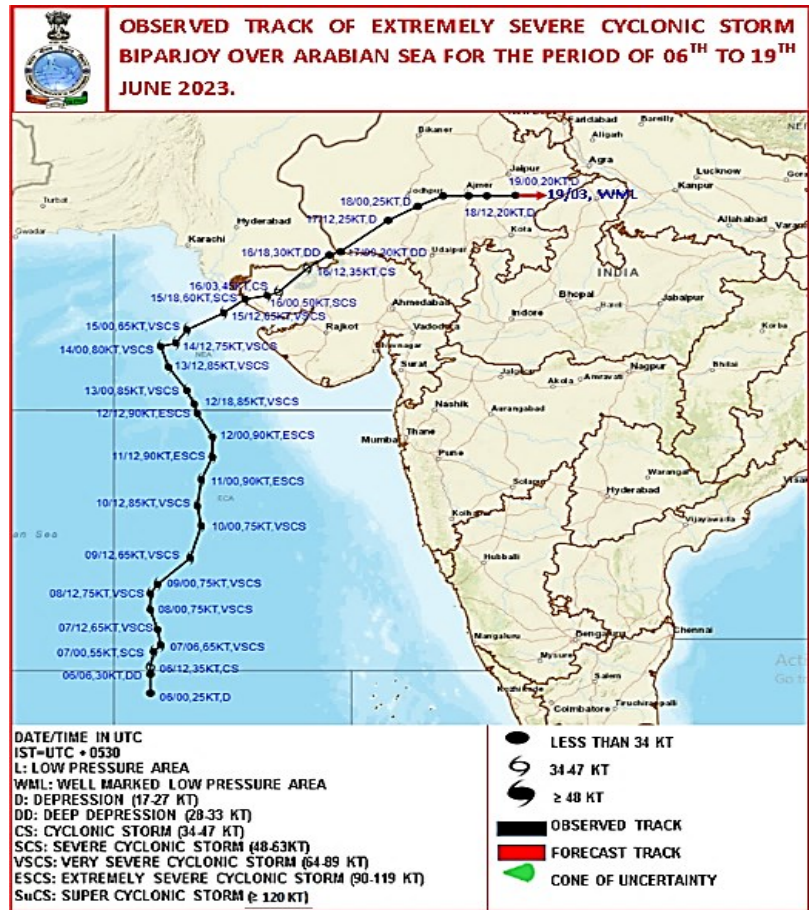
- The Arabian Sea is seeing **increased frequency** of cyclones in recent years due to several factors related to climate change.
- One factor is the **rising sea surface temperature (SST)** and resultant high ACE in the Arabian Sea, which provides more energy and moisture for cyclone formation and intensification.



### How Cyclones are Tracked and forecasted

- Cyclones are tracked by various methods that use different types of data and technology.

- One method is **satellite imagery**, which provides a visual representation of the **cyclone's structure, location, movement and intensity** from space.
- Another method is **weather radar imagery**, which uses radio waves to detect the precipitation and wind patterns within the cyclone **from ground stations**.
- A third method is **numerical modelling**, which uses mathematical equations to **simulate the physical processes** of the cyclone based on various input data such as **SST, wind speed, pressure, humidity** etc.
- A fourth method is **reconnaissance flights**, which involve flying specially equipped aircrafts into or near the cyclone to collect direct measurements of its pressure, temperature, wind speed, wind direction etc.



### How India Got Better at Cyclone Mitigation and Management

- India has enhanced its cyclone readiness and mitigation by investing in **early warning systems, disaster management plans, public awareness campaigns** and **infrastructure development**.
- India has a **three-tiered response mechanism** for cyclones: **software** (early warning system, awareness, evacuation), **hardware** (shelters, weather instruments, embankments), and **resilient infrastructure** (underground power and water lines, flood-proof railway and airport networks, health systems).
- It has a network of satellites, radars, buoys, and aircrafts that monitor and track cyclones in the Indian Ocean, and a dedicated agency, the **India Meteorological Department (IMD)**, that issues timely and accurate forecasts, colour coded warnings and advisories.
- Long term measures including building of **bulwark, natural (mangroves) and artificial walls** to stop storm surge could prove to save life and property.
- India deploys a **national disaster response force (NDRF)** that coordinates with state and local authorities to conduct **rescue and relief operations** during and after cyclones, and has built cyclone shelters, coastal embankments, storm water drains and communication systems to protect lives and property from cyclone hazards.

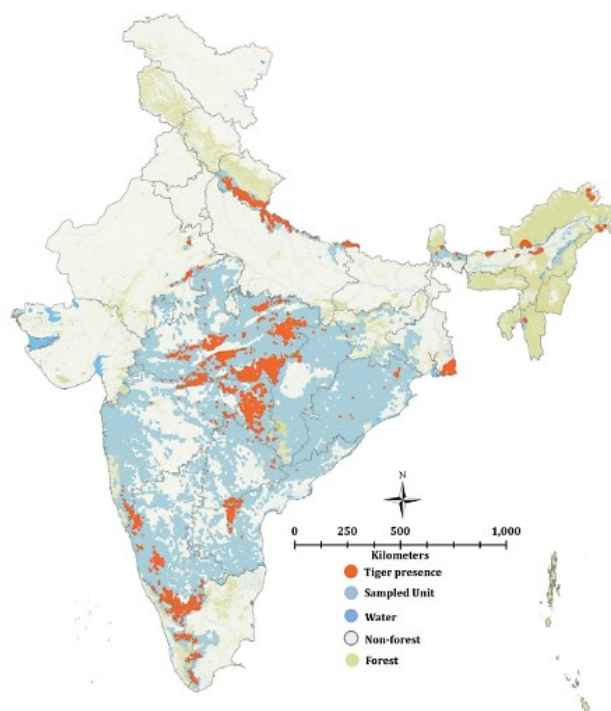
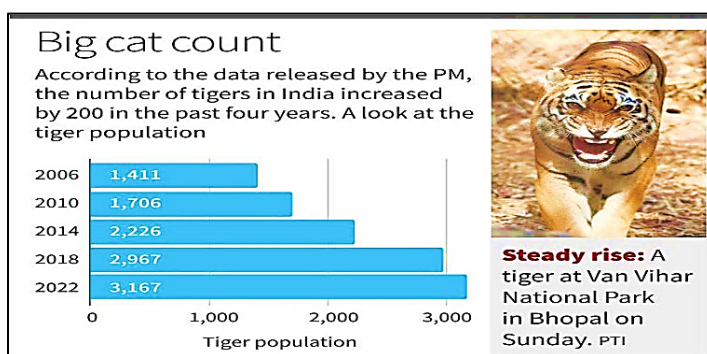




## TIGER POPULATION AND TRANSLOCATION

**In News:** India and Cambodia have signed MoU for biodiversity conservation and tiger re-introduction in Cambodia.

- Meanwhile, according to tiger population estimates from the latest tiger census, India has **at least 3,167 tigers**.
- India hosts close to **75% of the world's tiger population**, and its conservation success, evidenced by increasing tiger numbers from 1,411 in 2006 to at least 3,167 presently, **without relying on fenced reserves**, is seen as a global model worth emulating.
- Also, the tiger population has **grown in 4 of the 5 tiger landscapes**. There was a decline in the Western Ghats numbers, though major populations were said to be stable.
- However, experts have said that most of the country's tigers are focussed within a **handful of reserves** which are fast approaching their **peak carrying capacity**, and unless new regions are developed as reserves, it may be a challenge to ensure further growth in numbers.
- All of the five major tiger-zones face challenges to the growth of the tiger population due **habitat encroachment, illegal hunting of both tigers and their prey, conflicts between humans and wildlife, unregulated and illicit cattle grazing, excessive harvesting of non-timber forest produce, human induced forest fires, mining, and ever-expanding linear infrastructure**.
- Since 1973, when Project Tiger was established, the number of dedicated tiger reserves has grown from **9 reserves** covering 18,278 square km to **53 reserves** spanning 75,796 square km, which is roughly **2.3% of India's land area**.



### Tiger Translocation Project of 2018: A Failed Endeavour

- Two tigers from Kanha and Bandhavgarh Tiger Reserves in **Madhya Pradesh** were relocated to Satkosia Tiger Reserve in **Odisha** in 2018.
- The project was a failure as one tiger died possibly due to attack by poachers and the 2<sup>nd</sup> one was relocated after it became a man-eater.
- Thus, India's first inter-state tiger translocation project failed.
- General factors contributing to the failure of India's inter-state tiger translocation project include **poor prey augmentation, insufficient capacity building** of staff, inadequate **protection enhancement, diversion of funds** allocated for Project Tiger, and **tiger-human conflicts**.

### National Tiger Conservation Authority (NTCA)

- NTCA is a **statutory body** established in 2005 under the Ministry of Environment, Forests and Climate Change, operating under the Wildlife (Protection) Act, 1972.
- NTCA is **headed** by the **Minister of Environment and Forests**, with members including the Minister of State (as Vice-Chairperson), three Members of Parliament, and the Secretary of the Ministry.

- Tiger IUCN status in India: **Endangered.**
- Tiger population in India: **Increased steadily.**
- **St Petersburg Tiger Summit** (Russia) of 2010 is said to have laid down the guiding principle behind **tiger conservation** in the 13 tiger ranging countries.

### M-SAND POLICY RAJASTHAN

**In News:** Rajasthan govt has started to promote **manufactured sand (M-Sand)** as an **inexpensive and easy alternative** to **river sand (Bajri)**.

- The Rajasthan government had launched a policy on manufactured sand (M-sand) in 2021 to provide a **cheap and easy alternative** to **river sand (Bajri)** for construction work.
- The **M-sand produced** after crushing hard granite stone, rocks extracted from quarries is the **nearest substitute** of river sand.
- The policy aims to solve the problem of **illegal sand mining**, use **waste from mines** and **create employment opportunities** at the local level.
- The **M-sand units** have been given **industry status** and **incentives** under the **Rajasthan Industrial Promotion Scheme (RIPS) 2019**.
- The policy mandates the use of at least **25%** of M-sand in **government constructions**.



#### River Sand



- **Naturally available** and extracted at **river banks/ river beds**.

#### M-Sand



- It is **manufactured in factory** by crushing **hard granite and aggregate rocks** extracted from **quarries** to sand size particles in a factory.

<ul style="list-style-type: none"> <li>• Availability of <b>moisture</b>: affects the concrete mix design and quality of concrete.</li> <li>• Rounded shape and smooth surface.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>No Moisture</b> content: better for water management of concrete.</li> <li>• Angular shape and rough texture: <b>better for concrete</b>.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>More impurities</b>.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Fewer impurities</b>.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Harmful</b> to the environment. It reduces <b>ground water levels, affects breeding grounds and resident/migratory species</b>.</li> </ul>	<ul style="list-style-type: none"> <li>• Causes <b>less damage</b> to the environment as compared to river sand.</li> </ul>

### Methods to solve the sand crisis:

- Meeting the needs of construction sand through **M-sand**.
- **Mapping** sand deposits and **environmental impact assessment** for mining activities.
- **Satellite imagery** for monitoring of river sand areas.

### Impact of river-bed sand mining:

**Chambal**: over exploitation of riverine sand (sponge for fresh water), resulting in depleted groundwater, destruction of breeding ground for gharials, etc.

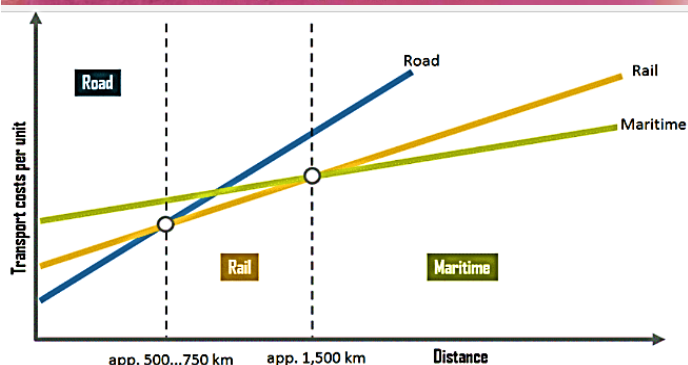
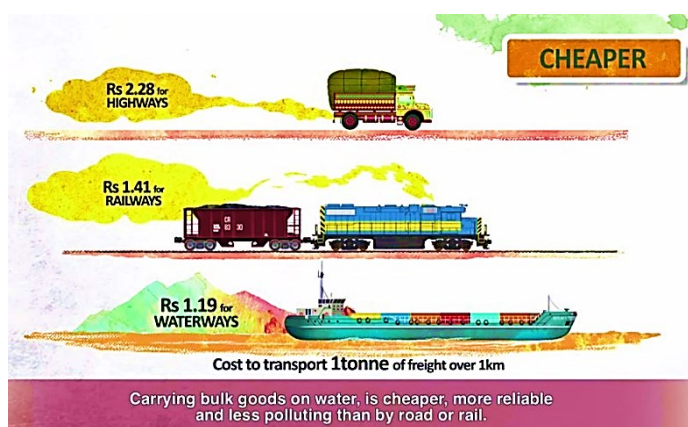
**Son**: shallow river-bed, changing course of river, eroding banks, resulting in floods.

- **Rivers in Punjab**: depletion in water table.

## GREEN SHIPPING

**In News:** The **Union ministry of ports, shipping & waterways (MoPSW)** announced five major initiatives called '**Panch Karma Sankalp**' that aim to make shipping greener and ports more digital.

- Incentive scheme to **offer 30% financial support for green shipping projects** that aim to **reduce emissions, improve energy efficiency, and adopt digital technologies**.
- Deendayal Port and VO Chidambaranar Port, Tuticorin, will become **Green Hydrogen Hubs**, using clean energy sources.
- Under the **Green Tug Transition Programme**, Jawaharlal Nehru Port, VO Chidambaranar Port, Paradip Port, and Deendayal Port, Kandla, will each get two new tugs. (hybrid propulsion and later based on Methanol, Ammonia, and Hydrogen).
- The ministry will also launch a **single window portal** to ease and track river and sea cruises.



- Jawaharlal Nehru, VO Chidambaranar and Tuticorin ports will be upgraded to **digital smart ports**.

**Green shipping** means using less resources and energy when transporting people and goods by sea.

**Green Shipping strategies:**

- Use of alternative fuels such as LNG, hydrogen, ammonia, or biofuels
- Improving the design and efficiency of the hull and propeller
- Installing wind or solar power systems
- Slowing down the speed of the ship (slow steaming to reduce emissions)
- Using digital tools for optimization and monitoring

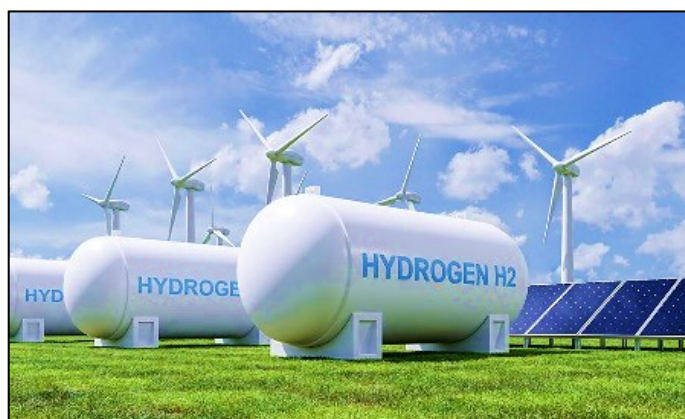
**Reasons to focus on maritime transport and targets:**

- Maritime transport is the backbone of global trade and economy, as it carries more than **90% of world trade**.
- According to the **International Maritime Organization (IMO)**, international shipping accounted for **about 2.9% of global CO2 emissions** in 2018.
- The IMO aims to reduce overall greenhouse gas emissions from ships by **50% from 2008 levels by 2050**.
- India intends to increase the share of **renewable energy to 60%** of the total power demand of each of its major ports from a **present share of less than 10%**.
- The ports have also aimed to **reduce Carbon emissions per ton** of cargo handled by **30% by 2030**.

**INTER-STATE TRANSMISSION CHARGE**

**In News:** The government has announced a complete waiver of the **inter-state transmission system (ISTS)** charges on the **off-shore wind, green hydrogen, and green ammonia projects** for **25 years**, commissioned on or before Dec 31, 2032.

- The waiver is applicable to off-shore projects commissioned on or before December 31, 2032, for **a period of 25 years**. However, the projects commissioned from 1st January 2033 would be given graded ISTS charges.
- The government also granted a **complete waiver** of ISTS charges for green hydrogen/green ammonia production units, which uses renewable energy (commissioned after March 8, 2019), pumped storage system or battery storage systems, or any hybrid combination of these technologies.
- This decision has been taken to facilitate wider execution of offshore wind energy initiatives, to promote the expansion of **green hydrogen/green ammonia projects** and to encourage the offtake of renewable energy from energy storage system projects.
- The decision will reduce the **effective cost of production** of cleaner energy by approx. **\$0.73/kg** of green hydrogen produced.



### What is ISTS Charge?

- The ISTS charge is levied **to transmit electricity from one state to the other**.
- The government is expecting that green hydrogen/green ammonia facilities will be set up in the **vicinity of export terminals** and **end-use industries**.
- Renewable energy (RE) production, however, is likely to be situated in **RE-rich states**, to optimise the **cost and capacity utilisation factor (CUF)** of generation.
- To increase the utilization of clean energy production, govt has **waived off** the charges on such transmitted RE, which are utilized for clean energy production.

### MERI LIFE, MERA SWACHH SHEHAR

**In News:** Union Housing and Urban Affairs Ministry launched a campaign 'Meri LiFE, Mera Swachh Shehar'.

- To promote **reuse and recycle** of old items such as clothes, shoes, toys and books.
- **RRR (Reduce, Reuse & Recycle) centres** to be launched nationwide serving as **one-stop solution** for depositing plastic items, clothes, shoes, books, and toys.
- Provides an impetus to the overall **zero-waste ecosystem** under the Swachh Bharat Mission-Urban 2.0.
- Aim to strengthen citizen resolve for RRR, aligning with **Mission LiFE's sustainable habits** for environmental protection.

#### Mission LiFE (Lifestyle For Environment)

- An India-led global mass movement to nudge individual and community action to protect and preserve the environment.

### GLOBAL GREENHOUSE GAS TRACKING NETWORK

**In News:** **193 countries** have unanimously approved creation of a **global greenhouse gas monitoring mechanism**, under the **Global Greenhouse Gas Watch**, coordinated by **World Meteorological Organization (WMO)** to support urgent action to **reduce heat-trapping gases** which are fuelling temperature increase.

- The new mechanism will **combine observations from earth and from space** with modelling, to **fill critical information gaps** and **support the implementation of the Paris Agreement** on climate change.
- It will track, report and freely exchange data on the **levels** and **trends** of **carbon dioxide**, **methane**, and **nitrous oxide** in the atmosphere.
- According to WMO, between 1990 and 2021, **the warming effect** on our climate from the main greenhouse gases, carbon dioxide, methane and nitrous oxide, rose by **nearly 50%**.
- The WMO Secretary-General says there are still **uncertainties and information gaps** regarding the role of natural sources and sinks of greenhouse gases, such as the ocean, land biosphere and permafrost areas.
- The decision of WMO comes as **greenhouse gas concentrations** are at record levels, higher than at any time over the last 800,000 years and have a **warming effect** on our climate.

## Greenhouse gases and their global warming potential

- Greenhouse gases are gases in the atmosphere that absorb solar radiations, causing the Earth's surface to warm up. This is known as the **greenhouse effect**. It is considered as the main cause of climate change.
- The Earth has a **natural greenhouse effect** due to trace amounts of water vapour (H<sub>2</sub>O), carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O) in the atmosphere.
- These gases let the solar radiation reach the Earth's surface, but they absorb infrared radiation emitted by the Earth and thereby lead to the heating of the surface of the planet.
- If it were not for the **natural greenhouse gas effect**, earth's average temperature would be a chilly -18 °C.
- The **enhanced greenhouse effect** refers to the **additional radiative forcing** resulting from increased concentrations of greenhouse gases **induced by human activities**. The main greenhouse gases whose concentrations are rising are carbon dioxide, methane, nitrous oxide, hydrochlorofluorocarbons (HCFCs), hydrofluorocarbons (HFCs) and ozone in the lower atmosphere.
- Different greenhouse gases have **different abilities** to trap heat and affect the climate. To compare the impacts of different gases, scientists use a measure called the **global warming potential (GWP)**.
- The GWP of a gas is a measure of **how much energy the emissions of one ton of that gas** will absorb over a given period of time, relative to the emissions of one ton of carbon dioxide (CO<sub>2</sub>).

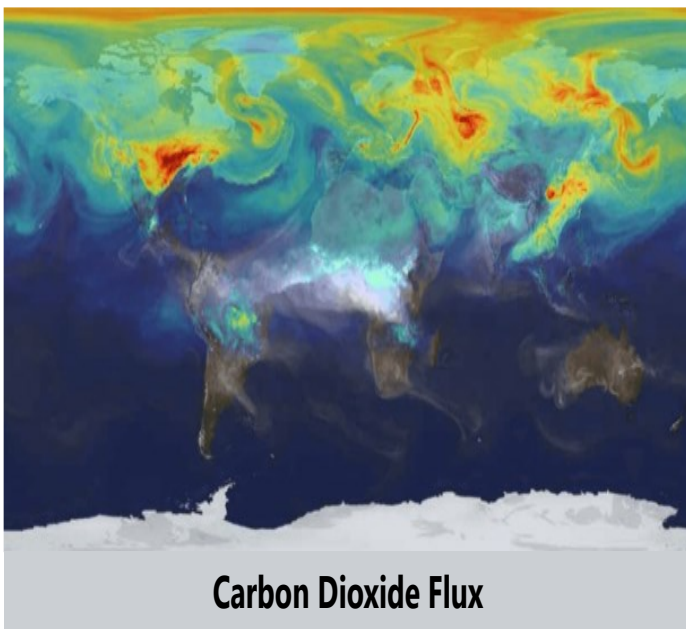
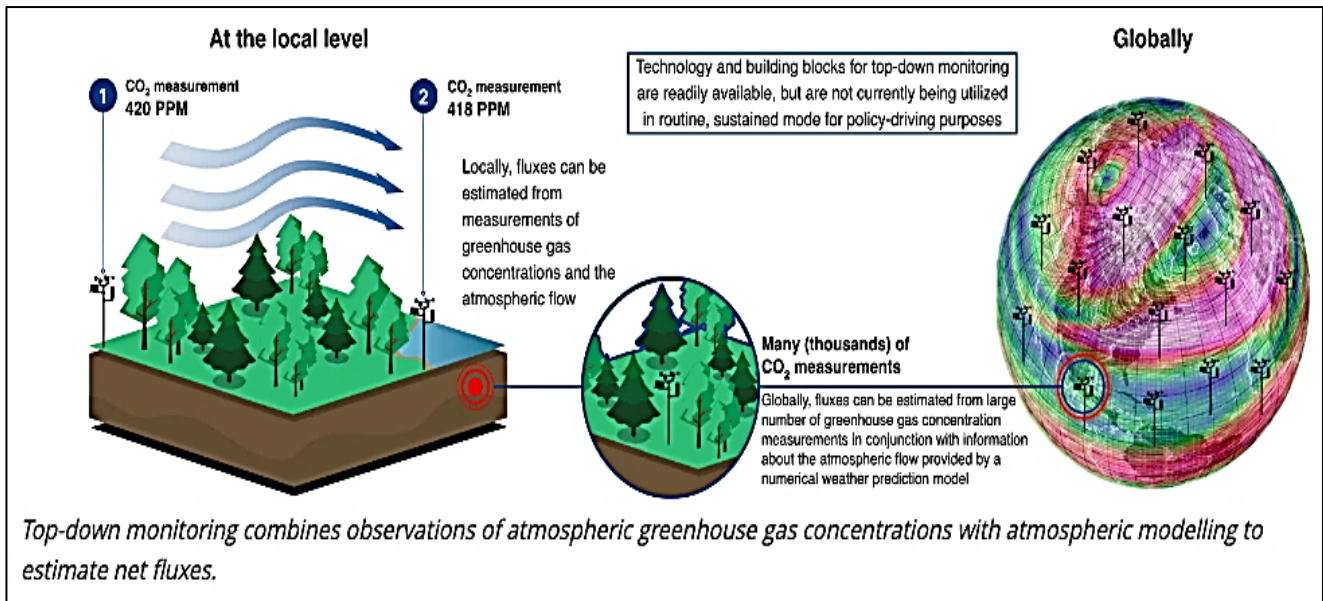
Greenhouse Gas (GHG)	Atmospheric Lifetime (yrs)	Global Warming Potential (GWP)	Primary Current Sources
Carbon dioxide (CO <sub>2</sub> )	50-200	1	Fossil fuel use, land use, cement
Methane (CH <sub>4</sub> )	12±3	21	Fossil fuel use, agriculture
Nitrous oxide (N <sub>2</sub> O)	120	310	Mostly agriculture, ~1/3 are anthropogenic
Hydrofluorocarbons (HFCs)	1.5 to 209	150 to 11,700	Alternative to ozone depleting substances
Perfluorocarbons (PFCs)	2,600 to 50,000	6,500 to 9,200	Primary aluminum production; semiconductor manufacturing
Sulfur Hexafluoride (SF <sub>6</sub> )	3,200	23,900	Used in electric power transmission, magnesium and semiconductor industries

} High GWP gases

- CO<sub>2</sub> is the reference gas and has a GWP of 1.** The higher the GWP of a gas, the more it warms the Earth compared to CO<sub>2</sub>. The GWP also depends on the time period used, because some gases stay longer in the atmosphere than others. The most common time period used is **100 years**.

The **Paris Agreement** is a landmark deal that aims to limit the global temperature rise to **well below 2°C above pre-industrial levels**, and pursue **efforts to limit it to 1.5°C**.

It requires countries to submit and update their national climate action plans, known as **nationally determined contributions (NDCs)**, every five years.



### Global Greenhouse Gas Watch (GGGW)

- It is a WMO coordinated **global Greenhouse Gas Monitoring Infrastructure**.
- It is involved in sustained, routine global monitoring of **greenhouse gas concentrations and fluxes**.
- GHG fluxes are the amounts of GHGs that are emitted or absorbed by different **sources and sinks**, such as fossil fuels, land use, agriculture, forests, oceans, and permafrost areas.

### World Meteorological Organization

As an **intergovernmental organization and specialized agency** of the United Nations, WMO is dedicated to international cooperation and coordination on the state and behavior of the Earth's **atmosphere**, its **interaction with the land and oceans**, the **weather and climate** it produces, and the resulting distribution of **water resources**.

The WMO has 193 Member States and Territories. It is headquartered in **Geneva, Switzerland** and was founded in 1950.

## DEBT FOR CLIMATE SWAP

**In News:** With many developing nations facing a **triple whammy** of **rising debt loads, climate change and nature loss**, conservationists have proposed "**Debt-For-Climate (DFC) swaps**" as a solution to tackle the situation.

- The world's poorest countries **owe \$62 billion** in annual debt service, a year-on-year **increase of 35%**, the World Bank said in December, warning of a rising risk of defaults.

### What is Debt for Climate Swap?

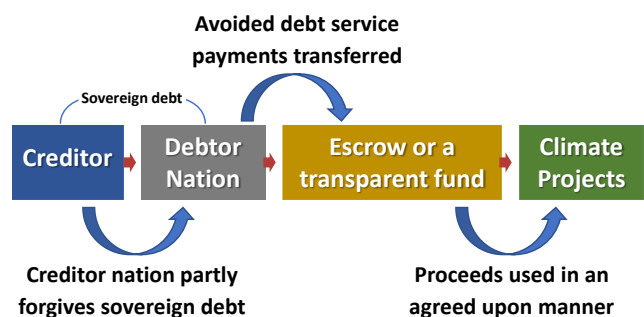
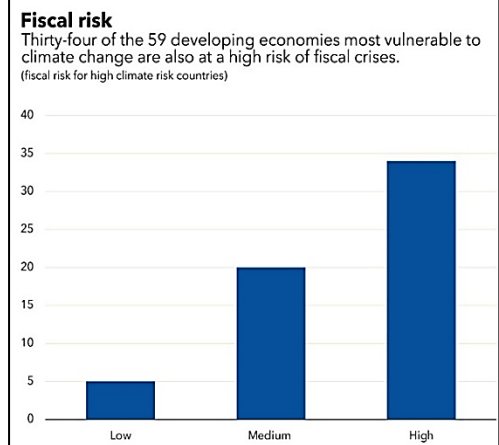
- It is an agreement where a **creditor forgives** a portion of debtor's foreign debt, or provides it **debt relief**, in return for a commitment by the government to **invest in a specific environmental project** such as **decarbonization, climate-resilient infrastructure, or biodiversity conservation**.
- They were introduced as a debt restructuring device to simultaneously **combat climate change** and **prevent further debt accumulation** in affected countries. These swaps reduce indebtedness and **allocate freed fiscal resources for green investments**.
- Debt-for-climate swaps (DFCs) evolved from **debt-for-nature swaps**, introduced in the **1980s** to promote **biodiversity conservation & tropical forest protection** in exchange for debt relief.
- The first debt-for-nature swap occurred **in 1987 between Bolivia** and Conservation International, whereas first debt-for-climate swap occurred between **Germany and Indonesia in 2006**.
- They have gained popularity among low- and middle-income countries as a **debt-relief tool**. Multilateral development banks and organisations like the UNDP have been promoting this approach to ease the burden of debt for these nations.

### Impact due to DFC Swap

- Enhanced climate spending:** during the times of climate change and increased vulnerability.
- Boost economy recovery:** post rise in external debt burden post-covid.
- Potential solution for Small Island Developing States (SIDS):** to tackle their two primary challenges: adapting to **rising climate risks and recovering from financial distress**.
- Regard the commitment of Creditor countries:** to support development of climate-resilient and clean futures through **Paris Agreement** and the **Glasgow Financial Alliance for Net Zero (GFANZ)** as a response to **historical injustice** around climate change aversion.
- In 2021, a \$553-million swap for Belize reduced its debt level by more than 10% of GDP and provided funds to protect the world's second-largest coral reef.

### Limitations DFC Swap

- Applicable only in case of small loans
- Needs flexibility with the creditor
- Challenge of routing finances to non-preferred areas, diverting from the immediate need





## EARTH SYSTEM BOUNDARIES (ESB)

**In News:** The Earth Systems (geosphere, biosphere, cryosphere, hydrosphere, and atmosphere) that shape our environment are **currently at risk**, as indicated by a recent evaluation by **Earth Commission experts**.

- These Earth Systems have **9 planetary boundaries** majorly based on **8 parameters** that play a vital role in the planet's life support systems of the planet and human well-being.

- The **8 parameters** are –

### 1. Climate Change

### 2. Functional integrity (an ecosystem's capacity to contribute to biosphere processes and to produce Nature's contribution to People)

### 3. Natural ecosystem area

### 4. Surface water

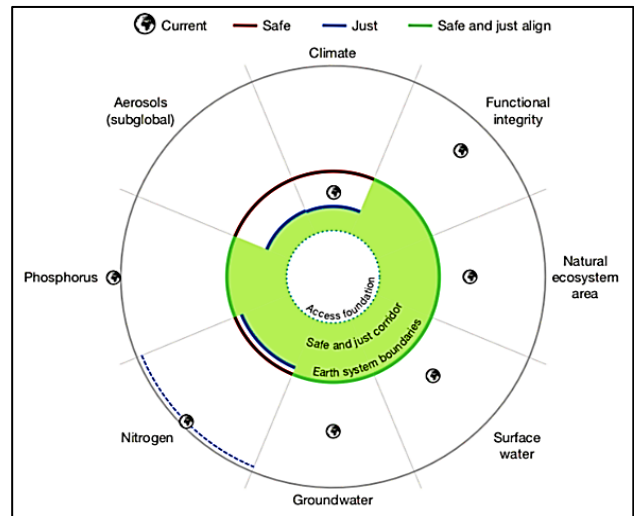
### 5. Ground water

### 6. Nitrogen

### 7. Phosphorous

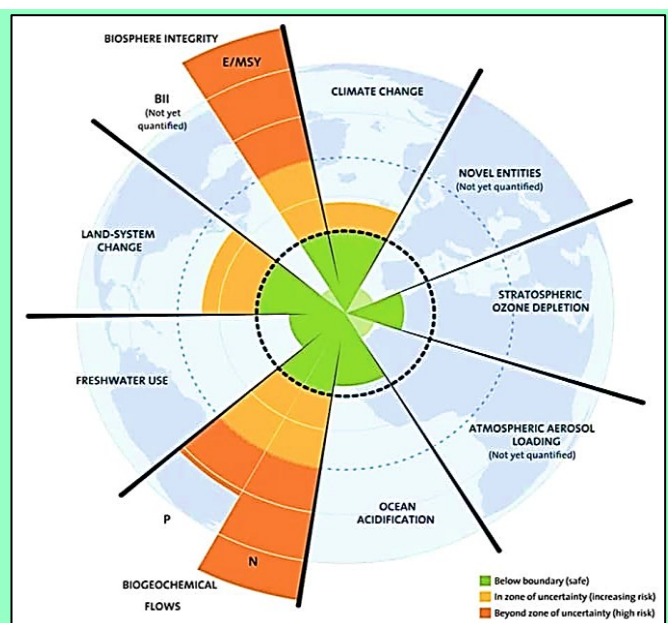
### 8. Aerosols

- According to the research by Earth Commission, **7 out of 8 parameters have breached the critical limit** except the **Atmospheric Aerosol**, an indicator of global air pollution.
- Over **52% of land surface is suffering from at least two or more ESB critical level breaches** that have a potential negative effect on at least **86% of the world population**.
- The research paper titled "**Safe and Just Earth System Boundaries**" by the **Earth Commission** also proposes a set of safe and just Earth System Boundaries (ESBs) for climate, the biosphere, fresh water, nutrients, and air pollution at global and subglobal scales, considering interconnected processes like the carbon, water, and nutrient cycles, known as the "**global commons**."
- These features have an impact on human well being, policy relevant timescale, earth system stability for sustainable development.



## Earth System Boundaries/ Planetary Boundaries

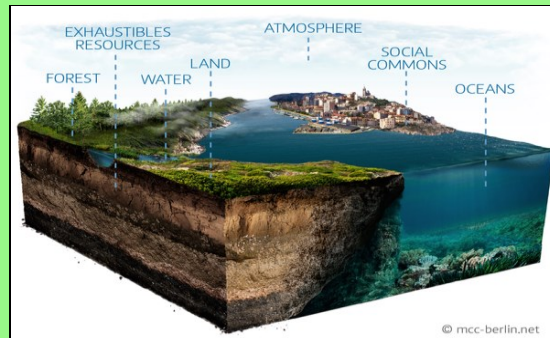
- In 2009, a group of **global scientists** introduced the concept of **planetary boundaries** to elucidate essential natural processes that, when maintained in **equilibrium, uphold biodiversity** and pave the way for sustainable development.
- Humanity has surpassed the safe operating limits in **four of the nine planetary boundaries** that define a sustainable and safe existence for our species, specifically in the areas of **climate change, biodiversity integrity loss, land-system change, and biogeochemical flows of nitrogen and phosphorus**.



### The Earth Commission: Global Commons Alliance

- The Earth Commission is an **international team** of leading natural and social scientists and five working groups of additional experts.
- **Aims & Objectives:** to establish scientific guardrails for Earth's life support systems, defining a safe and just corridor for people and the planet.

### Global Commons



It refers to **internationally shared resources**, beyond any **country's exclusive jurisdiction**, requiring **collective** governance by the international community. These resources include the **oceans, atmosphere, outer space, Antarctic**, and potentially **cyberspace**, necessitating common management due to their status as common-pool resources.

### SEA BUTTERFLIES

**In News:** New study reveals extreme vulnerability of smallest Southern Ocean sea butterflies to climate change, resulting in its population decline.

- Increasing CO<sub>2</sub> absorption by the ocean leads to **acidification**, **dissolving the delicate outer shells** of sea butterflies, making their survival challenging.
- The decline in the population of small sea butterflies affects larger pteropods and other marine organisms that **rely on them for food**, causing potential disruptions and ripples in the Antarctic marine food chain.
- The ocean is the **most acidic in winter** because cooler water absorbs more CO<sub>2</sub>. This means, the winter months are the most dangerous for the shelled sea butterflies.

**Holoplanktonic organisms** Float, drift, or weakly swim their entire life in water.

### Sea Butterfly

- Sea butterflies, or **Thecosomata**, are shelled **pteropods** (calcifying zooplanktons) found in all oceans.
- Sea butterflies are **holoplanktonic**, spending their entire life cycle in the water column.
- Thus, they have muscular feet for swimming in water.
- They are diverse and abundant in **colder waters**.
- They have bilateral symmetry and a coiled or uncoiled shell of various shapes.
- Sea butterflies possess wing-like lobes for propulsion and a head with eyes, tentacles, and a long proboscis for capturing prey.
- They rely on their body surface for gas exchange, with reduced or absent gills.



## GEKKO MIZORAMENSIS

**In News:** Researchers from Mizoram University and the Max Planck Institute for Biology discovered a new gecko species along the Indo-Myanmar border in Mizoram.

- It is also being called as **parachute gecko**, named so because of **skin flaps** along the body and **tail** enabling it to glide.
- The new species has been named Gekko Mizoramensis after the state of Mizoram.
- **Characteristics:**
  - Glides between trees (Arboreal animals: ability to climb trees), and is nocturnal.
  - Residential geckos are commonly spotted on building exteriors.
  - 20 cm in length.
- IUCN status remains unknown due to **data deficiency**.



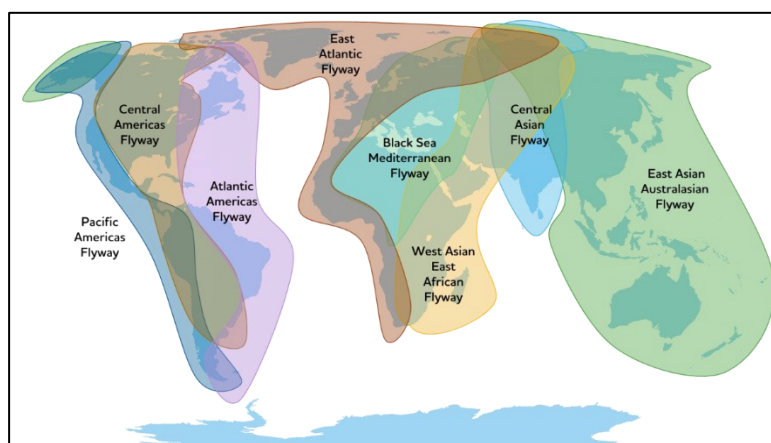
### About Gekko

- The genus Gekko contains **morphologically diverse lizards** represented by 86 species distributed across South and Southeast Asia.
- Geckos are small carnivorous lizards found worldwide in warm climates. They are known for their **unique vocalisation and loud mating calls**.

## CENTRAL ASIAN FLYWAY

**In News:** The Ministry of Environment, Forest and Climate Change, in collaboration with United Nations Environment Programme and Convention on Migratory Species (Bonn Convention), organised a meeting for the Central Asian Flyway (CAF) framework spanning from the Arctic Ocean to the Indian Ocean.

- Eleven countries: India, Armenia, Bangladesh, Kazakhstan, Kyrgyzstan, Kuwait, Mongolia, Oman, Saudi Arabia, Tajikistan and Uzbekistan, have agreed on the **Central Asian Flyway (CAF) framework** to enhance **conservation efforts** for migratory birds and their habitats.
- CAF is one of the flyways recognized under the Bonn Convention (CMS) for migratory species, of which India is a party. It hosts over **400 migratory bird species** including threatened/endangered species like **Siberian crane and the lesser white-fronted goose** which migrate through **30 countries** in their flyway/range.
- A flyway is a **geographical region** within which a number of migratory bird species **complete their annual cycle**. The annual cycle includes breeding, moulting, staging and non-breeding.



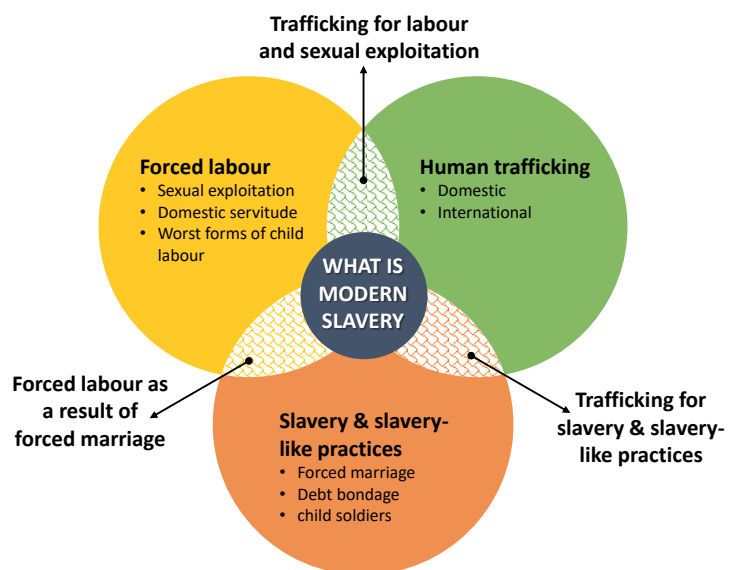


# SOCIETY

## GLOBAL SLAVERY INDEX

**In News:** The Global Slavery Index 2023 (5th edition) reveals that the **G20 countries** host **more than 50%** of the estimated **50 million** people who live in 'modern slavery', which is a 25% rise, in five years.

- The **Group of 20 (G20)** nations are contributing to this increase, as their **trade operations and global supply chains** allow for **human rights abuses**.
- **India ranks at the top** of the list within the G20 with approximately **11 million** people working as forced labourers, followed by China, Russia, Indonesia, Turkey, and the United States.
- The report gains significance as India holds the **G20 presidency this year**, with a focus on sustainable development and climate change mitigation.
- The report is published by the **Walk Free Foundation**, a human rights organisation and is based on data provided by the Global Estimates of Modern Slavery, which, in turn, is produced by **International Labour Organization (ILO), Walk Free, and International Organization for Migration (IOM)**.



### What is modern slavery?

- It refers to situations of **exploitation** that a person **cannot refuse or leave** because of **threats, violence, coercion, deception, or abuses of power**.
- It is an **umbrella term** which includes abuses such as **forced labour, forced marriage, debt bondage, sexual exploitation, human trafficking, slavery-like practices, forced or servile marriage**, and the **sale and exploitation of children**.
- **Target 8.7** of the United Nations' Sustainable Development Goals (SDGs) aims to **combat modern slavery and human trafficking** and calls for immediate and effective measures to eradicate forced labour, end modern slavery, and eliminate the worst forms of child labour, including child soldier recruitment by setting the goal for eliminating all forms of child labour by 2025.

### Country-wise findings:

#### There are three sets of key findings:

- The first set consists of countries that top in terms of the **prevalence of modern slavery**, it refers to the incidence of modern slavery **per 1,000 population**. On this count, the following 10 countries

are the worst offenders: **North Korea, Eritrea, Mauritania, Saudi Arabia, Turkey, Tajikistan, the UAE, Russia, Afghanistan, and Kuwait.**

- These countries share some **political, social, and economic characteristics**, including limited protections for civil liberties and human rights.
- The second set consists of countries with the lowest prevalence and includes countries such as **Switzerland, Norway, Germany, Netherlands, Sweden, Denmark, Belgium, Ireland, Japan, and Finland.**
- The third set consists of countries hosting the maximum number of people living in modern slavery and includes countries such as, **India, China, North Korea, Pakistan, Russia, Indonesia, Nigeria, Turkey, Bangladesh, and the US.** These countries account for nearly two in every three people living in modern slavery and over half the world's population.

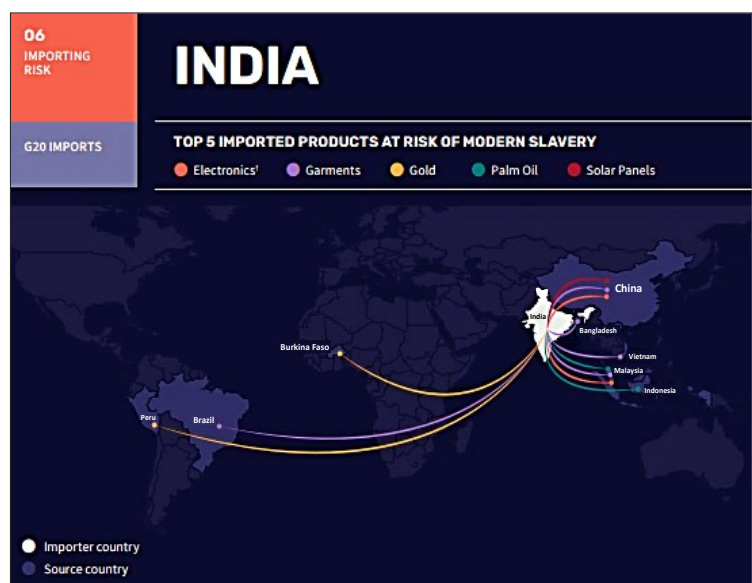


**Contributing Factors:**

- The slavery has become more prevalent over the last five years, as **climate change, armed conflict, weak governance and health emergencies like COVID-19** worked to remove a person's freedom.
- The report focuses on the link between the importation of high-risk products like **electronics, textiles, palm oil and solar panels**, and their involvement in forced labour, human trafficking, and child labour.
- The report highlights the **textiles industry's** significant role in forced labour describing conditions of forced and unpaid work, health and safety risks, poor wages, lack of benefits, and debt bondage. It mentions examples like the **Sumangali scheme** in **Tamil Nadu** trapping women and girls in exploitative conditions.

**India's stance on modern slavery**

- India passed the **Bonded Labour Abolition Act of 1976** that prohibits the practice of bonded and forced labour, it was amended in 1985 to include contract and migrant workers.
- India has a **Central scheme for Rehabilitation of Bonded Labour**, one part of which includes providing financial assistance to the rescued individual.



- The Supreme Court ruled that non-payment of **minimum wages** amounts to “forced labour” under **Article 23** of the Constitution.

#### Article 23

- Article 23 of the Constitution of India **prohibits traffic in human beings and forced labour**. It also allows the State to impose compulsory service for public purposes, without any discrimination on grounds of religion, race, caste or class.

#### Criticism of the report

- **Defining modern slavery:** The report uses a **broad and vague definition** of modern slavery, as modern slavery has **no internationally agreed definition** and it is a made-up concept with no international legal definition as the definition used in this index has changed from year to year.
- **Ranking methodology:** the report relies on surveys that are **not representative of the whole population** or the whole country and may suffer from **sampling bias, measurement error, cultural differences, and ethical issues**.
- **Stereotyping:** Ranking countries in this way is **stigmatising poorer countries** and **absolving richer countries** of their responsibility for issues like trafficking in persons.  
**E.g.** UK has been rated as a country working towards rehabilitation of the exploited, where as there are lesser victim protection and visa access along with an Illegal Migration Bill pending in the country.

#### Measures to tackle the Slavery Challenge

- **Trade:** Reduce sourcing of goods linked to modern slavery.
- **Addressing risk factors:** embedding anti-slavery measures in climate change sustainability plans, improving criminal justice.
- **Rescue and Rehabilitation:**
  - Providing primary and secondary **education** to children and tightening regulations around forced and **child marriage, child soldiers**, etc.
  - **Formalization** of work force (contrasting case of torturous reverse migration of informal work force during Covid lockdown)
  - **Economic independence** of women and participation in labour force

### INTERNATIONAL ORGANIZATION FOR MIGRATION (IOM)

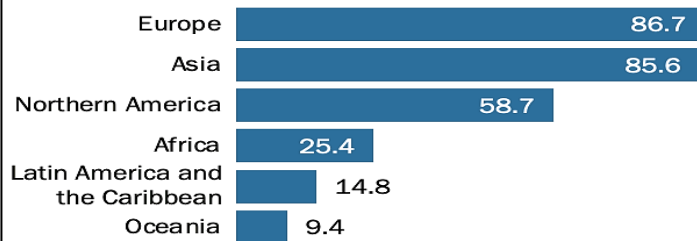
**In News:** Amy Pope of USA has been appointed as the first female head of IOM.

- IOM is a related organisation of the UN **directly under the General Assembly and Security Council**.
- Established in 1951, the leading intergovernmental organisation in the field of migration is committed to the principle that **humane and orderly migration benefits migrants and society**.
- It is headquartered at Geneva, Switzerland and has 175 member states and 8 observer states.

## Key facts about recent trends in global migration

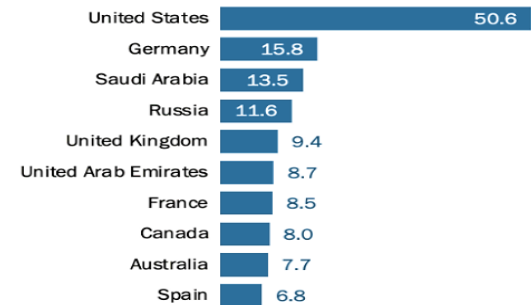
### Europe and Asia were home to the most international migrants in 2020

International migrant population in \_\_\_\_, in millions



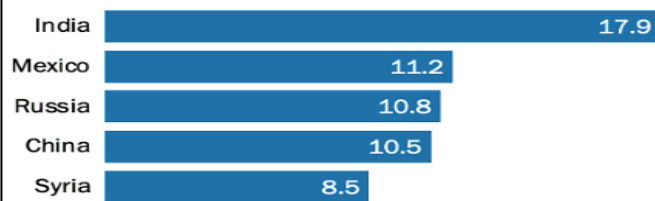
### The U.S. has more international migrants than any other nation

Number of international migrants per country, in millions, 2020



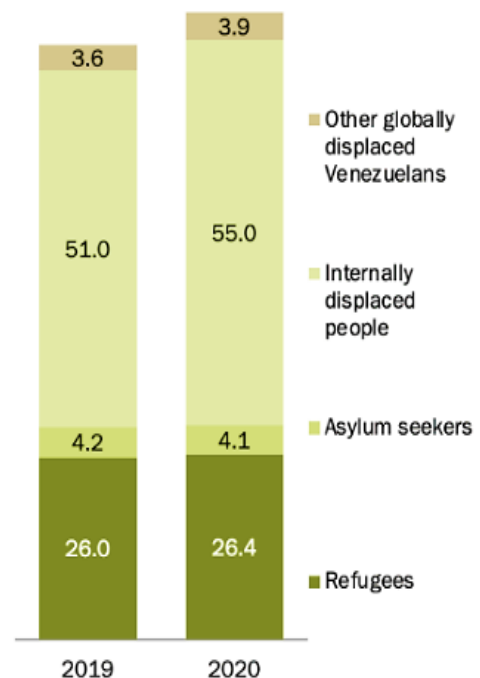
### India was the top origin country of emigrants living around the world in 2020

Country of origin of international migrants, in millions



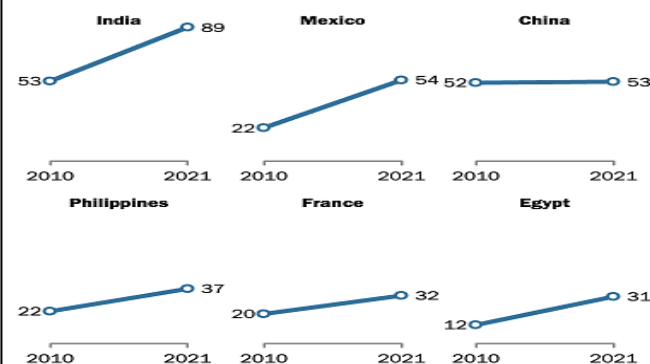
### Global population of displaced people reached nearly 90 million in 2020

In millions



### Between 2010 and 2021, international remittances to five of the top six receiving countries grew

Remittance inflows in billions of nominal U.S. dollars



## NHRC ACCREDITATION

**In News:** Global Alliance of National Human Rights Institutions (GANHRI) has postponed the accreditation of National Human Rights Commission (NHRC).

- Based on **Paris principles**, 7 human rights institutions **Amnesty International, CSW, Front Line Defenders, Human Rights Watch International Commission of Jurists, International Federation for Human Rights (FIDH)**, and the **World Organisation Against Torture (OMCT)** objected to NHRC India's 'A' rank accreditation.
- It is the 2<sup>nd</sup> time GANHRI has postponed the accreditation of NHRC-India. Reasons given were:
  - Political interference.
  - Police involvement regarding issues in investigations.
  - Lack of cooperation with civil society in addressing human rights violations.

- Lack of diversity in staff and leadership.
- Insufficient action to protect marginalised groups.

### **Global Alliance of National Human Rights Institutions (GANHRI)**

- It is an **international network** of National Human Rights Institutions (NHRIs).
- It is recognized by the **United Nations** and serves as a platform for cooperation and exchange among NHRIs, enhancing its role & effectiveness to safeguard human rights.
- GANHRI facilitates the **sharing of best practices** and experiences among NHRIs.
- It promotes compliance with international human rights standards, particularly **the Paris Principles** by NHRIs.
- It was established in 1993.

### **Paris principle**

- International benchmarks that guide the accreditation of **National Human Rights Institutions (NHRI)**.
- **Accreditation status**
  - **'A status'** – NHRIs that are fully compliant with the Paris Principles. These enjoy **independent participation rights** at the UN Human Rights Council and some General Assembly bodies. They are eligible for full **GANHRI membership** with **voting** and **governance privileges**.
  - **'B status'** – NHRIs that are **partially compliant** with the Paris Principles. They have limited voting rights and cannot hold governance positions.
  - **'C status'** – non-member & non-compliant with the Paris Principles
- Sets out **six main criteria** that NHRIs are required to meet –
  - Mandate and competence.
  - Autonomy from the government.
  - Independence guaranteed by a statute or Constitution.
  - Pluralism.
  - Adequate resources.
  - Adequate powers of investigation.
- Adopted in **1993** by the **UN General Assembly**.

### **National Human Rights Commission (NHRC)**

- A statutory body established under the **Protection of Human Rights Act (PHRA)**, 1993.
- NHRC represents India's commitment to **safeguarding and promoting human rights**.
- It is in conformity with the Paris Principles.
- **PHRA's Section 2(1)(d)** defines human rights as the constitutionally guaranteed rights of life, liberty, equality, and dignity, as well as rights outlined in international covenants and enforceable by Indian courts.

### **Universal Declaration of Human Rights (UDHR)**

- UDHR includes **30 articles** protecting "**basic rights and fundamental freedoms**" universally for all individuals, covering civil, political, economic, social, and cultural rights.
- It was adopted by the United Nations General Assembly on **December 10, 1948**.



## NON-COMMUNICABLE DISEASE BURDEN

**In News:** India has a much higher burden of **diabetes** and other non-communicable diseases (NCDs) such as **hypertension**, **obesity** and dyslipidemia, according to a first-of-its-kind comprehensive nationwide study conducted by the Indian Council of Medical Research (ICMR) and Madras Diabetes Research Foundation

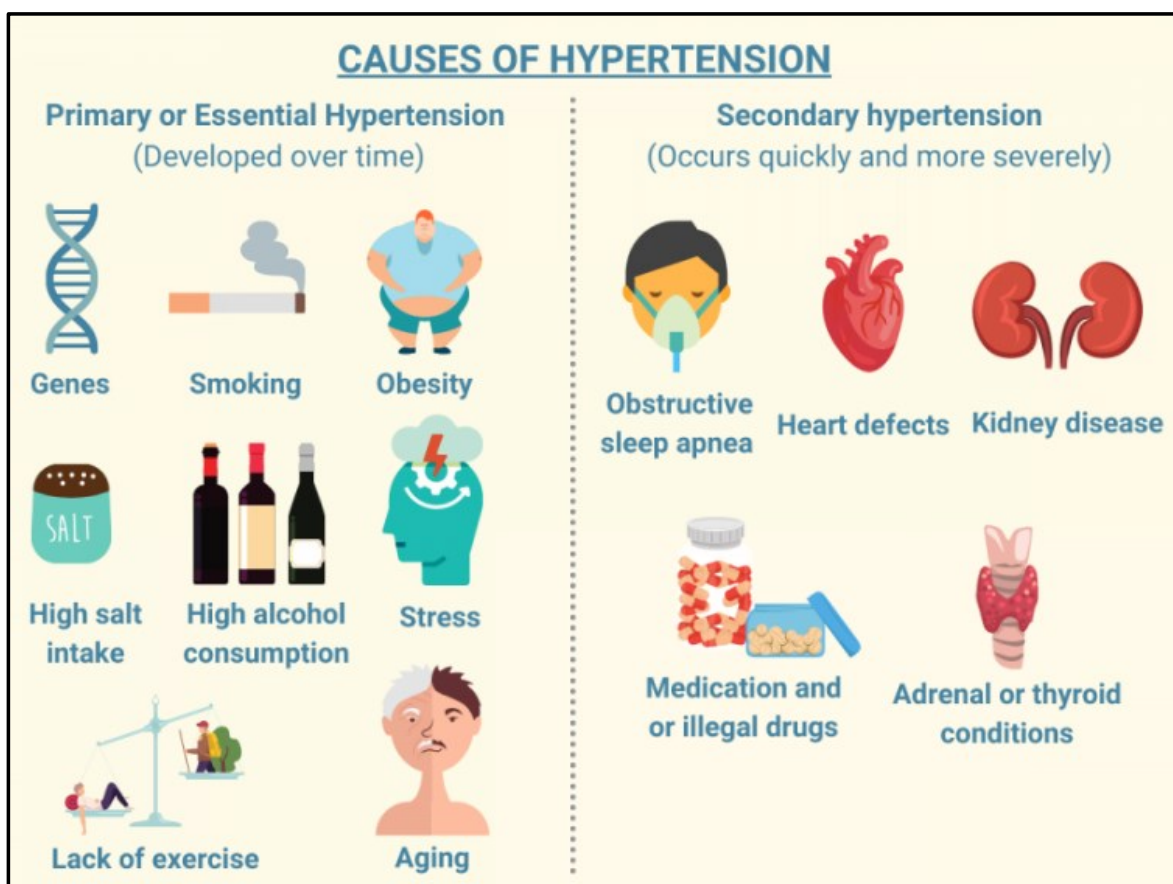
- The study revealed the national prevalence of **diabetes** is 11.4%, **prediabetes** 15.3%, **hypertension** 35.5%, generalized **obesity** 28.6%, abdominal **obesity** 39.5% and hypercholesterolemia 24% and high LDL cholesterol at 20.9%.
- The major NCDs involve **cardio-vascular disease (CVD)**, **cancer**, **chronic respiratory disease (CRD)** and **diabetes**.
- Data also suggests an increase in **deaths due to NCDs** from **approx. 40% in 1990 to approx 60% in 2016**.

Diabetes mellitus is a chronic disorder with **high blood sugar levels** caused by **insufficient insulin** production or utilisation. It is a non-communicable lifestyle disease.

- In normal condition, insulin is **released by the pancreas** in response to increased blood sugar levels after a meal.
- Insulin promotes the **storage of excess glucose as glycogen** in the liver and muscles, lowering blood sugar levels.
- It inhibits the breakdown of stored glycogen, preventing blood sugar levels from rising too high.
- It facilitates the uptake of amino acids into cells **for protein synthesis**, affecting protein metabolism.
- **Types of diabetes mellitus:**
  - **Type 1 diabetes:** An **autoimmune condition** where the body's immune system mistakenly attacks and destroys the insulin-producing cells in the pancreas.
  - **Type 2 diabetes:** The most common form and occurs when the body becomes resistant to insulin or doesn't produce enough insulin.
  - **Gestational diabetes** develops during pregnancy and usually resolves after childbirth, but it increases the risk of developing type 2 diabetes later in life.
- **Reasons of diabetes mellitus**
  - Genetic mutations
  - Sedentary lifestyle, poor diet, obesity, and lack of physical activity
  - Medical conditions such as polycystic ovary syndrome (PCOS), high blood pressure, and certain medications can elevate the risk of diabetes.
- **Treatment of diabetes mellitus**
  - Medications, insulin therapy
  - Blood sugar monitoring and regular medical check-ups
  - Healthy diet, regular physical activity & weight management

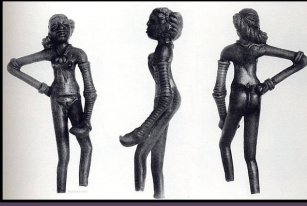
- The National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases, and Stroke (NPCDCS) is implemented under the National Health Mission (**NHM**) based on proposals received from States/UTs and subject to available resources.
- Pradhan Mantri Bhartiya Janaushadhi Pariyojana (**PMBJP**) offers affordable quality generic medicines, including insulin, in collaboration with state governments.
- **Ayushman Bharat - Pradhan Mantri Jan Arogya Yojana (PMJAY)** provides in-patient care treatment for 10.74 crore eligible families based on the Socio-Economic Caste Census (SECC) database 2011.
- **Eat right India movement** launched by FSSAI to sensitise people about healthy dietary patterns.

## Hypertension



- It is a condition when the **pressure of the blood** pushing through blood vessels is **consistently too high**.



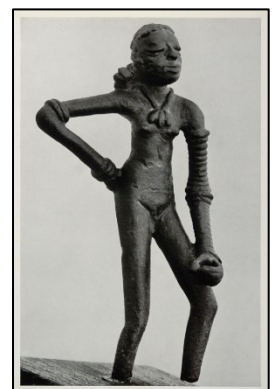
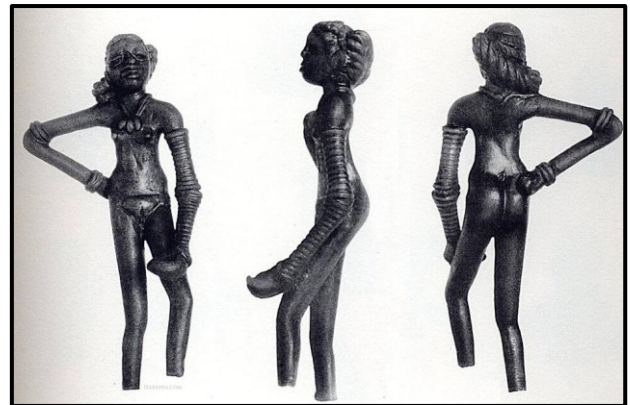


# HISTORY & CULTURE

## DANCING GIRL

**In News:** The Ministry of Culture made a modernised version of Indus valley civilization's Dancing Girl as the expo mascot for the International Museum Expo 2023, which drew flak from several quarters for distorting the original figure's form.

- The **Dancing Girl figurine** is one of the **most iconic and captivating artefact** from the Indus Valley Civilisation, which flourished in the northwest of the Indian subcontinent from about **3300 to 1300 BCE**.
- The figurine is **made of bronze** using the **lost-wax casting technique**, and measures only **10.5 cm in height**. This small but unique statue gives us an idea of the skill of the artisans of that time.
- The statue is named the 'Dancing Girl' owing to her posture, with her **right hand on the back** of her hip and the **left hand resting on her left thigh**.
- Her features are prominent with **large eyes, curly hair** and **a flat nose**. She appears to be adorned by a **necklace** alongside some **bangles**.
- Her **hair is plaited on the back** and neatly tied in a bun. Her arms are unnaturally long which is a common feature of the artefacts of this time. Her **head is tilted slightly backwards**.
- An interesting fact to notice is that the number of bangles in her hands differ. She has 24 bangles in one hand and 4 in the other.
- The figurine was discovered in 1926 by **British archaeologist Ernest Mackay** in **Mohenjodaro**, one of the largest and most sophisticated urban centres of the **Indus Valley Civilisation**.
- Mohenjodaro was located on the banks of the Indus River in present-day Pakistan, and had a **well-planned layout, advanced drainage system, public baths, granaries, and monumental structures**.
- The figurine has different interpretations by scholars. Some say she is a **dancer**, an **offering bearer**, or a **door guardian**.
- The figurine has also inspired many artists and writers to create works based on it or influenced by it. For example, **Rabindranath Tagore** wrote a poem called **"The Bronze Girl"** in Bengali after seeing a photograph of the figurine. The figurine has also been **featured** on postage stamps, coins, books, films, and other media.



- The figurine is now displayed at the **National Museum in New Delhi**, India, where it was allocated after the **Partition of 1947**. It is widely regarded as a masterpiece of art and a **symbol of high culture** in Harappan society.
- The figurine shows a remarkable degree of **realism, naturalism, and expression** in its form and features. It also suggests that Harappan women had **a high status and freedom** in society, as they could adorn themselves with jewellery and display their bodies confidently.
- The Dancing Girl figurine is thus a remarkable piece of art that tells us about the prehistoric Indus civilisation that created it. It reveals their **artistic skills, cultural values, social norms, and aesthetic sensibilities**. It also evokes our curiosity and admiration for ancient world.

## YAZH INSTRUMENT

**In News:** The Ministry of culture is promoting 'Yazh', an ancient harp-like musical instrument and holding performances to rejuvenate the old performing arts while India hosts the G20 meetings.

- 'Yazh', an ancient harp-like instrument that was used in **Tamil music** for centuries.
- The name yazh comes from the **mythical animal Yali**, whose head was carved on the tip of the instrument's stem. The instrument has **gut strings** that ran from a curved ebony neck to a boat-shaped resonator covered with **goat skin**. The resonator has a bowl-like shape that amplifies the sound of the strings.
- The instrument is handcrafted from a solid block of wood, about two feet tall. It has seven or 14 strings, depending on the type of yazh. It is an open-stringed **polyphonous instrument** that could produce different musical scales.
- Dating back to ancient times, Yazh was played in **royal courts and temples**, as well as by **panars**, who were an ancient community of musicians.
- It was mentioned in many Tamil literary works, such as **Thirukkural and Silappatikaram**, which date back to the **Sangam period** (sixth century B.C. to third century C.E.). Yazh was considered to be one of the most **elegant and sophisticated** instruments of its time.
- At present, Yazh represents a unique and fascinating instrument showcasing India's **musical legacy and innovation**. It could also be a symbol of India's **diversity and achievements** in various fields, including arts and culture.



## VISVA BHARATI UNIVERSITY

**In News:** Visva Bharati University in West Bengal, India, will be the **first living heritage university** to receive the UNESCO World Heritage tag by the International Council on Monuments and Sites (ICOMOS: the advisory body to the UNESCO World Heritage Centre).

### History of Visva Bharati University

- Visva Bharati University was founded by Nobel laureate **Rabindranath Tagore** in **1921**.



- The university is located in **Shantiniketan**, a small town in West Bengal, India.
- The university promotes the ideals of universal brotherhood, harmony, and intellectual exchange.
- Visva Bharati became a central university in **1951** and has since expanded its academic programs and research activities.
- **Gurudev Rabindranath Tagore** called this place to be the '**abode of peace**'.
- The core ashram area includes Patha Bhavana (the first school set up by Tagore in 1901), Upasana Griha (prayer hall, locally known as the glass temple), Kala Bhavana, Sangit Bhavana, Santiniketan Griha, The Uttarayan complex includes five houses of Tagore and a museum.

### India's World Heritage Sites

- India has **40 UNESCO World Heritage sites**, including cultural sites like Agra Fort, Taj Mahal, Dholavira, Elephanta Caves, Red Fort complex, and Mahabodhi Temple complex in Bodh Gaya.
- The 52 sites in the Tentative List also include Temples at Bishnupur, West Bengal (added to the list in 1998); Mattancherry Palace in Kerala (added in 1998); Wild Ass Sanctuary, Little Rann of Kutch in Gujarat (added in 2006), according to the UNESCO website.

### United Nations Educational, Scientific and Cultural Organization (UNESCO)

- UNESCO works to **preserve cultural heritage, protect diversity, promote education**, and advance scientific research.
- It is a **specialised agency** of the United Nations which works under the **UN principal organ Economic and Social Council**.
- Established on **November 16, 1945**, and headquartered at **Paris, France**, UNESCO promotes international cooperation in education, science, culture, and communication.
- UNESCO has 193 Members and 12 Associate Members. UN membership grants automatic UNESCO membership. Non-UN member states can join with a two-thirds majority vote from the General Conference, based on the Executive Board recommendation.

### CHHOT BOATS

**In News:** A single chhot boat is being built as a joint initiative of England's Endangered Materials Knowledge Project and India, to revive lost art and sustain that industrial construction technique by placing it in the **National Maritime Heritage Complex, Lothal, Gujarat**.

- **Chhot boats** are **traditional sail boats** that were once widely used in the **rivers and coastal areas of Bengal**.
- The word 'chhot' means **to run**; chhots were designed to **cut through deep waters with speed**. The history of chhot boats is not well documented, but some experts believe that they date back more than **2,000 years** and were linked to the ancient maritime trade of Bengal.
- The port city of Tamralipta (now Tamluk) on the western bank of the **Rupnarayan river** was a major hub for chhot boat making and exporting. The opposite bank, Dihimandal Ghat, was another centre for manufacturing chhot boats.



- The unique **V-shaped structure** allows them to **cut through deep waters with speed and stability**.
- They are also known for their smoothness, robustness, and versatility.
- They can carry cargo, fish, and passengers across the estuaries and even into the sea.
- With the advent of **motorised boats** and the **silting up of the riverbeds**, the demand for chhot boats declined drastically. The craft of making chhot boats is now on the **verge of extinction**, as only a few old boat makers remain in the region.
- The chhot boat is a symbol of **Bengal's rich maritime heritage and culture**.
- Chhot boats reflects the skill, creativity, and adaptability of the people who lived by the rivers and the sea. It is a boat that deserves to be preserved and celebrated for its beauty and functionality.





# PRACTICE QUESTIONS

## PRACTICE CURRENT AFFAIRS MCQS

- Which of the following initiatives is/are part of the 'Panch Karma sankalp' announced by the Union ministry of ports, shipping & waterways (MoPSW) to make shipping greener and ports more digital?
  - Deendayal Port and VO Chidambaranar Port, Tuticorin as Green Hydrogen Hubs
  - Green Tug Transition Programme
  - Single window portal for river and sea cruises
  - All of the above
- Which of the following is/are not a green shipping strategy?
  - Using alternative fuels such as LNG, hydrogen, ammonia, or biofuels
  - Improving the design and efficiency of the hull and propeller
  - Installing wind or solar power systems
  - Increasing the speed of the ship
- Which of the following countries has left the IPI pipeline project in 2009 due to security and pricing issues?
  - Iran
  - Pakistan
  - India
  - China
- Which of the following is not an objective of the National Medical Device Policy 2023?
  - To make India a global leader in medical devices with 10-12% global market share in 25 years.
  - To establish and strengthen common infrastructure facilities in the medical devices clusters and fortify testing facilities for medical devices.
  - To foster innovation and R&D, including joint projects with academia and industry.
  - To regulate the import and export of medical devices.
- With reference to the 10<sup>th</sup> Schedule (Anti-defection law) of the Constitution, consider the following statements:
  - It was added by the 52nd Amendment Act of 1985.
  - It only lays down provisions related to the disqualification of members of State legislature only.
  - Decision of the speaker is final and it is not subjected to judicial review.Which of the following statements is/are correct?
  - 1 and 3 only
  - 3 only
  - 1 and 2 only
  - 1, 2 and 3.
- Under Anti-Defection law, a member can be disqualified if:
  - He/she voluntarily gives his membership.
  - He/she votes or abstains from voting, contrary to the direction issued by the legislature party.
  - If one-third of the members support the merger of the party with another political party.Which of the following statements is/are correct?
  - 1 and 2 only
  - 3 only
  - 1 and 3 only
  - 2 only.

7. With respect to NATO, consider the following statements:

1. The alliance members participate in defense and economic agreements.
2. There are 30 members in NATO at present.

Which of the statements given above is/are correct?

- (a) 1 only                      (b) 2 only  
(c) Both 1 and 2              (d) Neither 1, nor 2

8. With respect to India's economy, consider the following statements:

1. India is presently going through a snowball effect.
2. It will lead to shortage of investment and slowdown in growth in the immediate future.

Which of the statements given above is/are correct?

- (a) 1 only                      (b) 2 only  
(c) Both 1 and 2              (d) Neither 1, nor 2

9. Consider the following statements about the proposed Free Trade Agreement (FTA) between India and the Eurasian Economic Union (EAEU):

1. It would attract more Russian investments into India's sectors.
2. It would boost India's defence industry by facilitating joint production with Russia.
3. It would require India to address some non-tariff barriers such as sanitary and phytosanitary measures, intellectual property rights and labour standards that may affect its exports to the EAEU.
4. It would expose India to more competition from Russian and other EAEU products in sectors such as steel and chemicals.

Which of the statements given above is/are incorrect?

- (a) 1 only  
(b) 2 only  
(c) 3 and 4 only  
(d) None of the above

10. Which of the following is/are among the current issues with outer space activities?

1. Space weaponization
2. Space traffic management
3. Space debris and conflict
4. Space resource exploitation

Select the correct answer using the code given below:

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

11. Which of the following statements is/are correct about the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (Outer Space Treaty)?

1. It establishes that space shall be freely explored and used by all nations and shall be the province of all mankind.
2. It prohibits any military use of outer space, including the Moon and other celestial bodies, as well as any ownership or appropriation by any means.

Select the correct answer using the code given below:

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

12. Which of the following statements is/are correct about Kerala, India's first fully e-governed state?

1. It has launched over 80 e-governance applications for the people, covering various domains.
2. It has declared internet access a citizen's right and launched the KFON project to make internet access affordable.
3. It has introduced e-Sevanam, a single portal for delivering as many as 900 public services.

Select the correct answer using the code given below:

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



13. Consider the following countries:

1. Iran                      2. Jordan                  3. Lebanon  
4. Kuwait                  5. Georgia                6. Qatar

How many of the above-mentioned countries share a land border with Iraq?

- (a) Only two                      (b) Only three  
(c) Only four                      (d) Only five

14. Consider the following statements with regards to Earth System Boundaries (ESB):

1. The **planetary boundary** is the habitable region around the sun with ideal temperatures for liquid water to exist on a planet.
2. The **Goldilock Zone** establishes the boundaries of the environment within which humanity can safely function.
3. Over 52% of land has no ESB breaches affecting 86% of the world population.

How many of the above statements is/are correct?

- (a) Only one                      (b) Only two  
(c) Only three                      (d) None

15. Which of the following statements is/are correct about Neuralink, a company that makes brain-computer interface devices?

1. It could allow humans to connect their minds with machines and become smarter and more advanced.
2. It could help people with brain problems, such as not being able to see, hear, move, or think well, by improving their abilities.

Select the correct answer using the code given below:

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

16. Which of the following statements is/are correct about exoplanets?

1. They are planets that orbit stars outside our solar system.
2. They are detected by measuring the dimming of a star or the doppler shift of its light.

Select the correct answer using the code given below:

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

17. Which of the following statements is/are correct about the Global Greenhouse Gas Watch (GGGW), a WMO coordinated global greenhouse gas monitoring infrastructure?

1. It will track and report on the levels and trends of carbon dioxide, methane, and nitrous oxide in the atmosphere.
2. It will combine observations from Earth and from space with modelling, to fill critical information gaps and support the implementation of the Paris Agreement on climate change.

Select the correct answer using the code given below:

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

18. With reference to FDI and FPI, consider the following statements:

1. FDI brings capital, technology and management and FPI brings only capital.
2. FDI is more volatile than FPI.

Which of the following statements is/are correct?

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

19. What is the meaning of the "Government Route" in Foreign Investments?

- (a) It refers to the process of seeking permission from the government for foreign investments.
- (b) It indicates the route taken by the government to regulate and monitor foreign investments.
- (c) Investments can be made only in partnership with the government or government companies.
- (d) Investments can be made only via a foreign government body in India.

20. Which of the following statements is true about minimum public shareholding?

- (a) It is a rule that requires listed companies to have at least 25% of their shares held by the public.
- (b) It is a rule that requires listed companies to have at least 10% of their shares held by the public.
- (c) It is a rule that requires listed companies to have at least 51% of their shares held by the public.
- (d) It is a rule that requires listed companies to have at least 75% of their shares held by the public.

21. With reference to Press Note 3, consider the following statements:

- 1. It requires that those countries which share a land border with India can invest only with the prior approval of the GoI.
  - 2. It is not applicable to FDI investments.
- Which of the following statements is/are correct?
- (a) 1 only                      (b) 2 only
  - (c) Both 1 and 2            (d) Neither 1 nor 2

22. Consider the following statements:

**Statement I:** The Paris Principles serve as international benchmarks for accrediting National Human Rights Institutions (NHRIs).

**Statement II:** GANHRI, recognized by the United Nations, acts as a platform for NHRIs to cooperate and exchange, strengthening their role in safeguarding human rights and enhancing their effectiveness.

Which one of the following is correct in respect of the above statements?

- (a) Both Statement-I and Statement-II are correct, and Statement-II is the correct explanation for Statement-I
- (b) Both Statement-I and Statement-II are correct, and Statement-II is not the correct explanation for Statement-I
- (c) Statement-I is correct, but Statement-II is not correct
- (d) Statement-I is not correct, but Statement-II is correct

23. Consider the following statement regarding NHRC:

- 1. NHRC is a constitutional body established under the Protection of Human Rights Act (PHRA), 1993.
- 2. NHRC signifies India's dedication to upholding and protecting human rights.

Which of the statements given above is/are correct?

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

24. Match the following List I and List II.

List I (Term)	List II (Definition)
1. Blazar	a. A unit of distance equal to how far light travel in a vacuum in one year
2. Black Hole	b. A planet that orbits a star outside the solar system
3. Light Year	c. A type of active galactic nucleus (AGN) that emits a jet of ionised particles that is aligned with the observer's line of sight.
4. Exoplanet	d. A region of space where gravity is so strong that nothing, not even light, can escape.

Select the correct sequence from the options given below?

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

25. Consider the following statements:

1. The National Policy for Rare Diseases 2021 provides for financial support up to Rs. 20 lakhs under the Umbrella Scheme of Rashtriya Arogya Nidhi for treatment of all rare diseases.
2. The National Policy for Rare Diseases 2021 proposes to set up a National Consortium for Research and Development on Therapeutics for rare diseases.

Which of the statements given above is/are correct?

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

26. Consider the following statements about the world's largest grain storage plan in the cooperative sector:

1. The plan aims to set up a network of integrated grain storage facilities through Primary Agricultural Credit Societies (PACS) across the country.
2. The plan will be implemented by the Ministry of Agriculture and Farmers Welfare with the convergence of various schemes of other ministries.

Which of the statements given above is/are correct?

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

27. Consider the following statements about the G7:

1. It is an informal grouping of wealthy Western nations with no permanent secretariat or legal status.
2. It comprises the United States, Britain, Canada, France, Germany, Italy and Japan, as well as representatives from the European Union.
3. It was founded in the 1970s to discuss global economic issues.

Which of the statements given above is/are correct?

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

28. Consider the following statements on RBI Report on Currency and Finance:

1. Private sector banks are more prone to climate-related risks.
2. Higher use of CBDCs will lead to a higher carbon footprint.

Which of the statements given above is/are correct?

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

29. Which one of the following best describes the term "greenwashing:"

- (a) Conveying a false impression that a company's products are eco-friendly and environmentally sound.
- (b) Non-Inclusion of ecological/environmental costs in the Annual Financial Statements of a country.
- (c) Ignoring the disastrous ecological consequences while undertaking infrastructure development.
- (d) Making mandatory provisions for environmental costs in a government project/programme.

30. What does the term "net zero" refer to in the context of climate change?

- (a) Achieving absolute zero emissions across all sectors globally.
- (b) Reducing emissions by 50% compared to the pre-industrial levels.
- (c) Offset programs aimed at compensating for emissions through renewable energy projects.
- (d) Balancing emissions with equivalent carbon removal from the atmosphere.

31. Consider the following statements with respect to 'Global Slavery Index:

1. It is published by Walk Free Foundation.
2. The prevalence of modern slavery has decreased over the past five years.

Which of the statements given above is/are correct?

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

32. Which of the following statements is correct in the context of quantitative tightening posture:

- (a) It refers to the implementation of expansionary monetary policies to stimulate economic growth.
- (b) It signifies the reduction of interest rates to encourage borrowing and investment.
- (c) It involves the selling of financial assets by central banks to reduce the money supply and control inflation.
- (d) It is a strategy used by governments to increase public spending and boost aggregate demand.

33. Which of the following statements is correct in the context of depreciation?

- (a) Depreciation refers to an increase in the value of an asset over time.
- (b) Depreciation is the process of recording and recognizing the cost of an asset as an expense over its useful life.
- (c) Depreciation represents the amount of money a company owes to its creditors.
- (d) Depreciation is a financial ratio used to assess a company's profitability.

34. Consider the following statements regarding UNESCO:

1. UNESCO safeguards cultural heritage, fosters diversity, advances education, and promotes scientific research.
2. It is a specialized agency of the United Nations which works under the UN principal organ General Assembly only.
3. Visva Bharati University in West Bengal, India, first living heritage

university to receive the UNESCO World Heritage

Which of the statements given above is/are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) None

35. The term 'Silkworm Eating Strategy', sometimes found in news, refers to:

- (a) The boiled or steamed snack food is served in paper cups with toothpick skewers.
- (b) Silkworms can only survive on mulberry leaves, sometimes Osage orange or silkworm food, which is made from mulberry leaves.
- (c) The gradual encroachment strategy refers to a country's deliberate and successful infiltration into another territory over time.
- (d) Edible insects are a food source that has high nutritional value.

36. Consider the following statements regarding Migration:

1. India has been the world's top receiver of remittances since 2010.
2. As a continent, North America is the home to most international migrants.
3. International Organization for Migration is a UN-affiliated organisation that operates under the authority of the General Assembly and Security Council.

Which of the statements given above is/are correct?

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



## MAINS PRACTICE QUESTIONS

1. Discuss the challenges and opportunities for the medical devices sector in India. How can the government policies and initiatives help in boosting the domestic production and reducing the import dependency of medical devices? (150 words)
2. Discuss the advantages of having a unified accreditation regime in India. (150 words)
3. Discuss the need for M-sand policy in India. (150 words)
4. Analyze the problems around evergreening of loans and provide alternatives to the crisis. (150 words)
5. Discuss the issues around new age tropical cyclones and suggest measures for cyclone management. (150 words)
6. Analyse the role of small modular reactor in fulfilling energy needs of India. (150 words)
7. Discuss the grain storage capacity and need for augmenting the same in India. What are the issues associated with it? (150 words)
8. What are the issues associated with rare disease? Discuss India's plan to tackle the rare disease challenge. (150 words)

## ANSWER KEY (PRACTICE CURRENT AFFAIRS MCQS)

<b>QUESTION</b>	1	2	3	4	5	6	7	8	9	10
<b>ANSWER</b>	(d)	(d)	(c)	(d)	(a)	(c)	(d)	(a)	(d)	(d)
<b>QUESTION</b>	11	12	13	14	15	16	17	18	19	20
<b>ANSWER</b>	(c)	(d)	(b)	(d)	(c)	(c)	(c)	(a)	(a)	(a)
<b>QUESTION</b>	21	22	23	24	25	26	27	28	29	30
<b>ANSWER</b>	(a)	(a)	(b)	(b)	(b)	(a)	(d)	(d)	(a)	(d)
<b>QUESTION</b>	31	32	33	34	35	36				
<b>ANSWER</b>	(a)	(c)	(b)	(c)	(c)	(d)				

49  
100

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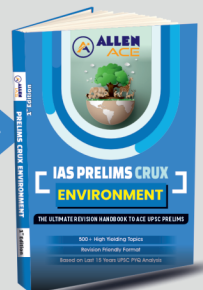
**Ques.** Consider the following statements:

1. In India, the Biodiversity Management Committees are key to the realization of the objectives of the Nagoya Protocol.
2. The Biodiversity Management Committees have important functions in determining access and benefit sharing, including the power to levy collection fees on the access of biological resources within its jurisdiction.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Source: Prelims Crux Environment Page No. – 55



### Biodiversity Act, 2002

- 3 tiered Hierarchy: NBA > SBB (state biodiversity Boards) > Local BMCs (Biodiversity Management Committee). Main function of BMCs to maintain the "People's Biodiversity Register (PBR)" in consultation with local people. The PBR contains information on availability and knowledge on local biological resources.
- Benefit sharing: can be monetary or non-monetary
- The act is in close synergy with the Nagoya Protocol of UNCBD.
- Also, deals with Genetic modified organisms etc.
- Section 6(1) of the act- If a patent application is based on information or research of biological resources obtained from India, no person shall apply for such patent without approval of NBA.
- Biodiversity Heritage Site (BHS):- Under section 37 of Biodiversity Act. State government declares BHS in consultation with local bodies.

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