

# Factly Monthly

**Compilation**

2024

**For UPSC CSE Prelims  
Exam**

**May, 2024**

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## UPSC Syllabus: Polity and nation

### Election Commission Directives on EVM and SLU Handling and Storage

#### Why in the news?

The Election Commission released a revised protocol for handling and storing symbol loading units, complying with the supreme court directive.

Recently, SC directed that the Symbol loading units should be sealed and secured in a container and stored in a strongroom along with the EVMs at least for 45 days post the declaration of results.

#### Supreme Court Directive on EVM Handling and Storage:

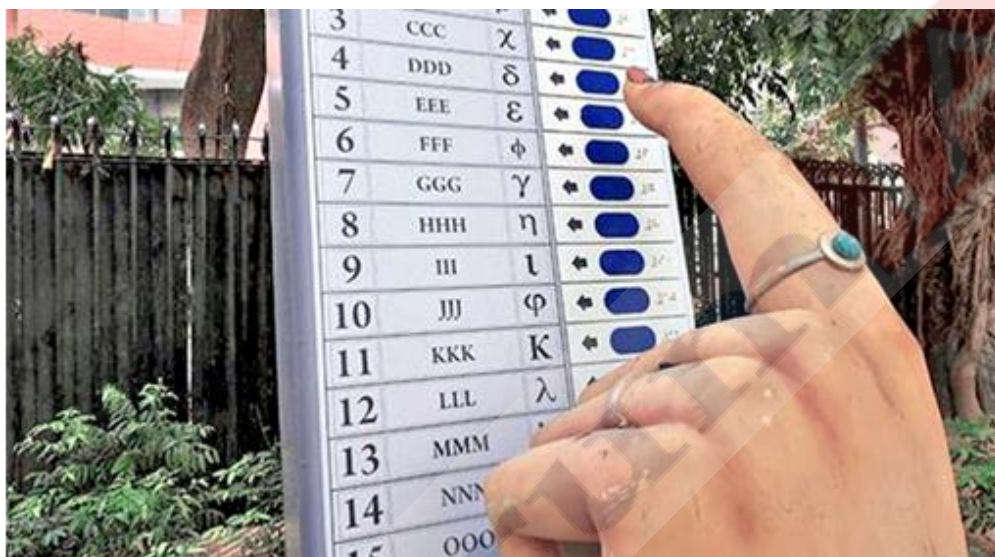


Figure 1. Source: The Hindu

#### 1. Seal and Storage

SLUs: The Supreme Court mandated the sealing and storage of symbol loading units (SLUs) along with electronic voting machines (EVMs) in a

container within a strongroom for a minimum of 45 days post-result declaration.

**Note:** SLUs are responsible for uploading the names and symbols of candidates onto Voter Verified Paper Audit Trail (VVPAT) or paper trail machines.

**2. Provision for verification by Candidates-** As per the court's directions, candidates ranked second and third in the elections can request verification of micro-controllers embedded in EVMs.

#### Election Commission Directives:

**1. New protocol:** As per the new protocol, the machines should be sealed and secured in a container and stored in a strongroom along with the EVMs for at least 45 days after the declaration of the results.

**2. Infrastructure Creation:** The Election Commission instructed State Chief Electoral Officers to establish appropriate infrastructure for handling and storing SLUs within EVMs in line with the updated protocols.

**3. Container Preparation:** EC also directed that adequate SLU containers, typically two to four per Assembly constituency should be prepared beforehand as per anticipated requirements.

**4. Implementation Date:** The revised protocols are effective for all symbol loading processes in VVPATs conducted on or after 1st May 24.



## Hindu Marriage Act 1955

### Why in the News?

The Supreme Court has held that mere registration of marriage, in absence of a proper ceremony, would not be valid under the Hindu Marriage Act. Through this judgement, **the supreme court has recognized the practice of 'samskara'**, which is a sacrament that must be followed in a Hindu marriage.

The court considered that **marriage is sacred under the Hindu Marriage Act** for it provides a lifelong, dignity-affirming, equal, consensual and healthy union of two individuals.

### About Hindu Marriage Act (HMA)1955

**1. About Hindu Marriage Act (HMA):** It is legislation that **regulates Hindu marriages and divorce by codifying laws** concerning these aspects within the **Hindu community**.

**2. Applicability:** The HMA applies to individuals who are **Hindu by birth or through conversion**. It also includes **Buddhists, Jains, and Sikhs**.

### 3. Provisions:

**a) Marriageable Age:** Under the HMA, the **minimum age for marriage is set at 21 for the bridegroom and 18 for the bride**. Marrying minors is punishable by imprisonment for up to three years and/or a fine of up to Rs 1 lakh.

**b) Recognition of Customs and Ceremonies:** The HMA **respects customary practices**, including the essential **ritual of Saptapadi**, where the bride and groom take seven steps before the sacred fire.

**c) Prohibition of Bigamy and Polygamy:** The Act **prohibits bigamy, polygamy, or polyandry**. **Section 5** declares **having two living spouses simultaneously illegal and punishable** under **Sections 494 and 495 of the Indian Penal Code**.

**d) Mental health as a criterion for void marriage:** Under the act, **Marriages are deemed void if one or both parties are mentally unfit**. Legal consent is required in such cases.

**e) Registration provision:** Registration is subject to state laws. However, **lack of an official certificate does not invalidate a marriage**.

**f) Divorce provision:** Divorce is permitted through **mutual consent or judicial separation**. Special circumstances may warrant divorce before one year of marriage. Various grounds for divorce are specified, including those allowing wives to seek divorce from their husbands.

**g) Restitution of Conjugal Rights:** The HMA includes provisions for **restitution of conjugal rights**, which allows a spouse to seek legal intervention if the other unjustifiably leaves.

**i) Legal Procedures:** **Family courts** handle matters concerning **Hindu marriages and divorce**. Cases are **heard in courts of territorial jurisdiction** based on the place of marriage, residence, or last cohabitation.

## SC directive on promoting products in media

### Why in the News?

The Supreme Court has mandated that **advertisers must provide self-declarations to confirm the accuracy of their product claims before advertising in the media**, aiming to protect consumers from deceptive marketing.

This ruling was prompted by a case involving misleading advertisements by Patanjali Ayurved.

### About the SC directive on promoting products in media

1. S.C directed the advertisers **to submit self-declarations**, affirming the accuracy of their product claims, before promoting them through various media channels.

#### 2. Implementation Plans:

a) To enforce this directive effectively, advertisers are mandated to adhere to the **Cable TV Network Regulations Rules of 1994**.

b) Advertiser **must upload their self-declarations on the Information and Broadcasting Ministry's 'Broadcast Seva' portal** before airing ads on TV channels. Copies of these declarations are also required to be provided to the broadcasters.

c) A **similar portal for print advertisers** will be established within a four-week timeframe.

**3. Responsibility of Promoters:** The Supreme Court has **emphasized on the responsibility** of social media influencers, celebrities, and public figures endorsing products. They have been **urged to possess sufficient knowledge about the products** they promote and to ensure that their endorsements are not contributing to deceptive advertising practices.

#### 4. Enhanced Consumer Protection Measures:

a) Recognizing the importance of consumer empowerment, the Court has directed the Centre **to establish a clear and accessible procedure for filing complaints** against misleading advertisements.

b) Consumers are entitled to be **informed of the outcomes of their complaints**, ensuring transparency and accountability.

**5. Government Action:** The Ministry of Health has been directed **to furnish data regarding complaints** received by the Food Safety and Standards Authority of India (FSSAI) pertaining to misleading advertisements and misbranding of food and health products. This transparency aims **to bolster consumer trust and regulatory efficacy** in the realm of product advertising and marketing.

## NIN's Dietary Guidelines

### Why in the News?

With noncommunicable diseases (NCDs) such as cardiovascular diseases, cancers, and diabetes on the rise, **India's National Institute of Nutrition (NIN) has released comprehensive dietary guidelines targeting vulnerable groups**, including pregnant and lactating women, children, and the elderly.

### About NIN's Dietary Guidelines

- 1. Addressing Disease Burden:** Unhealthy diets contribute to approximately 4% of India's disease burden. These guidelines stress the **importance of dietary improvements** to prevent NCDs such as Type 2 diabetes and heart disease.
- 2. Focus on Vulnerable Groups:** **Optimal nutrition** during critical periods like pregnancy, lactation, and early childhood is crucial for proper growth and development. Alarming rates of lifestyle-related conditions among children and adolescents underscore the need for targeted interventions.
- 3. Dual Nutrition Challenge:** **Micronutrient deficiencies are prevalent among children** aged 1 to 19, alongside persistent concerns such as anaemia. Additionally, obesity rates have surged, highlighting the dual challenge of undernutrition and overnutrition.
- 4. Importance of Dietary Guidelines:** The guidelines **advocate for healthy dietary practices, including reducing salt intake and limiting consumption of highly processed foods**. Tailored recommendations are provided for pregnant and lactating women, infants, children, and the elderly, emphasizing the consumption of nutrient-dense foods from diverse food groups.

## UPSC Syllabus: Governance

### Supreme Court Ruling on PMLA Arrest Norms

#### Why in the News?

The recent Supreme Court decision has specified the obligations to notify an accused of the reasons for their arrest under the [Prevention of Money Laundering Act \(PMLA\)](#).

#### About Supreme Court Ruling on PMLA Arrest Norms

[ Source: The Hindu

- 1. Enhancement of Personal Liberty:** The Supreme Court emphasized the **right to personal liberty** by stating that individuals summoned by a designated special court under the Prevention of Money Laundering Act (PMLA) are not considered to be in custody and are not required to apply for bail under the strict conditions of the PMLA.
- 2. Conditions for Custody:** The Court also ruled that if an accused responds to a **summons and appears before the special court**, it does not mean they are in custody. Therefore, applying for bail is unnecessary.
- 3. Limitation on ED's Powers:** The judgment restricts the Directorate of Enforcement's (ED) **ability to arrest individuals** after a special court has acknowledged a case. The ED must apply separately for custody and demonstrate specific reasons for needing custodial interrogation.
- 4. Provision for Furnishing Bonds:** The Court mentioned that the special court might require the accused to provide bonds as per **Section 88 of the Code of Criminal Procedure**. It clarified that providing a bond is merely an undertaking and does not equate to bail being granted. Thus, the stringent twin conditions of **Section 45 of the PMLA** do not apply when a bond is provided.
- 5. Bail Conditions Under PMLA:** The Supreme Court highlighted the stringent conditions for bail under **Section 45 of the PMLA**. Under this, the accused must prove their prima facie innocence and assure the



court they will not commit any further offences while on bail, placing a significant burden of proof on the accused.

## Supreme Court Judgment on Private Property Acquisition

### Why in the News?

Recently, the Supreme Court made a pivotal decision to safeguard private property against arbitrary state acquisition for "public purpose". The court ruled that compulsory acquisition without adhering to mandatory procedures, even if followed by compensation, is unconstitutional.

### About Supreme Court Judgment on Private Property Acquisition

**1. Constitutional Protection of Property:** The Supreme Court, in a judgment by **Justices P.S. Narasimha and Aravind Kumar**, emphasized that the right to private property is protected under the Constitution and is also considered a human right.

**2. Mandatory Procedures for Acquisition:** The court declared that for a valid acquisition of property, it is not sufficient to just have the power of eminent domain and provide compensation. **Proper legal procedures must be established and followed.**

**3. Article 300A:** Despite the omission of the right to property as a fundamental right by the **44th Constitutional Amendment**, Article 300A was added. It stated that no person shall be deprived of their property except by the authority of law. This involves adhering to due process.

**4. Procedural Rights:** These are the laws which act as the **'machinery' for enforcing rights and duties.** The Supreme Court outlined **seven procedural rights** that need to be respected during property acquisition:

- i) Right to notice** - the duty of the state to inform the person about the intended acquisition.
- ii) Right to be heard** - the state must listen to objections from the property owner.
- iii) Right to a reasoned decision** - the state must explain its decision regarding the acquisition.
- iv) Demonstration of public purpose** - the acquisition must exclusively serve a public purpose.
- v) Right to fair compensation** - the property owner is entitled to reasonable compensation
- vi) Efficient process** - the acquisition process should be conducted efficiently and within set timelines.
- vii) Conclusion of proceedings** - acquisition isn't complete without the actual physical possession of the property being taken.

## Foreigners Tribunals (FTs)

### Why in News?

The Supreme Court recently stopped the deportation of a woman who had been declared a foreigner by a Foreigners' Tribunal in Assam.

### About Foreigners Tribunals (FTs)

## Factly Compilation for the Month of May 2024

1. Foreigners Tribunals were established **under the Foreigners (Tribunals) Order, 1964**, which was enacted by the Central government utilizing powers from Section 3 of the Foreigners Act, 1946.

**2. Geographical Application:** While **applicable across India**, FTs are currently **operational only in Assam**. In other states, suspected illegal immigrants are presented before local courts under the Foreigners Act, 1946.

**3. Recent amendment:** Initially, only the Central government could establish FTs. The **2019 amendment** to the Foreigners (Tribunals) Order granted this power to state governments as well.

### 4. Role and Functions of FTs

**a) Detection of Suspected Foreigners:** The superintendents of police (SPs) and district commissioners identify suspected foreigners. The Election Commission of India can also refer cases of 'Doubtful' voters to the local SP, who then refers them to the FTs.

**b) National Register of Citizens (NRC):** Individuals excluded from the final draft of the NRC released in August 2019, can appeal to the FTs to establish their citizenship.

### 5. Procedures Followed by FTs

**a) Issuance of Notices:** Upon receiving a referral, the tribunal serves the suspected individual with a copy of the grounds of suspicion and a show-cause notice within 10 days, indicating the burden of proof lies with the individual to demonstrate they are not a foreigner.

**b) Opportunity for Defense:** The FT provides the individual a fair chance to make a representation in person or via a lawyer and to present evidence supporting their claim of citizenship.

**c) Consequences of Non-Compliance:** If the individual fails to prove their citizenship and cannot secure bail, the FT orders their detention and transfer to a detention center.

**6. Legal Authority and Precedence:** SC held that the decisions of the FTs on a person's nationality are binding and hold more weight than those of the Government, NRC verification authority, or other credentials.

## Institute of Chartered Accountants of India (ICAI)

### Why in News?

The Supreme Court recently **confirmed a regulation from the Institute of Chartered Accountants of India (ICAI) that limits chartered accountants to accepting no more than the "specified number of tax audit assignments" in a financial year.**

### About Institute of Chartered Accountants of India (ICAI)

|  |   |
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|  |   |
|  | <b>Statutory body</b> created by the Chartered Accountants Act of 1949, tasked with the <b>Chartered Accountancy profession in India.</b> |

## Factly Compilation for the Month of May 2024

|       |   |
|-------|---|
| nder  | s under the administrative control of the <b>Ministry of Corporate Affairs,</b><br><b>nt of India.</b>  |
|       | arters are located in <b>New Delhi.</b>   |
| nding | the <b>second-largest professional body of chartered accountants</b> globally.  |
| e     | <b>Structure:</b> The affairs of the ICAI are overseen by a Council according to the <b>Accountants Act, 1949,</b> and the <b>Chartered Accountants Regulations, 1988.</b><br><b>Composition:</b> The Council <b>comprises 40 members, with 32 elected by Accountants</b> and <b>8 nominated by the Central Government.</b><br>hinees typically represent entities like the Comptroller and Auditor General e Securities and Exchange Board of India, and the Ministries of Corporate Finance, among other stakeholders.  |
|       | <b>n:</b> It oversees the Chartered Accountancy profession.<br><b>and Examination:</b> Manages the education and examination of the Chartered cy course.<br><b>nal Development:</b> It facilitates continuing professional education and ost-qualification courses.<br><b>Setting:</b> It formulates accounting standards and prescribes standard ocedures.<br><b>andards:</b> It establishes ethical standards for the profession.<br><b>ssurance:</b> It monitors quality through peer reviews and ensures the ce standards of its members.<br><b>ry Actions:</b> It exercises disciplinary jurisdiction over members.<br><b>Reporting Review:</b> It conducts reviews of financial reporting.<br><b>visory:</b> It provides input on policy matters to the government. |

## UPSC Syllabus: Polity & Governance

### Election Commission Stance on Voter Turnout Disclosure

#### Why in News?

The Election Commission (EC) stated to the Supreme Court that there was **no “legal mandate”** to provide the voter turnout data to any person other than electoral candidates or their agents. The NGO on electoral

## Factly Compilation for the Month of May 2024

reforms ADR, claimed **delays and discrepancies in voter turnout data**, suggesting these issues could demotivate voters and raise doubts about the electoral process.

### Election Commission's Stance on Voter Turnout Disclosure

1. ECI stated there is **no legal mandate to share Form 17C data** (account of votes recorded) with anyone other than candidates or their agents, **as per the Conduct of Election Rules, 1961**.

**2. Rules 49S and 56C of the Conduct of Election Rules, 1961:** Under these rules, the presiding officer prepares an account of votes recorded in Part-I of Form 17C and makes it available to every polling agent present at the close of the poll. ECI emphasized that this framework has **"held the field for the last 60 years,"** and any changes would require amendments to the existing rules.

**3. ECI opposed ADR's plea on two grounds:**

**a) EC's concerns about Form 17C data-** Indiscriminate disclosure of Form 17C could lead to **image morphing and public mistrust**. Lack of scanners and internet facilities at polling stations complicates uploading Form 17C.

**b) Impracticality-** EC held that releasing authenticated voter turnout data within 48 hours is impractical due to the **detailed verification process required**.

**4. Legal Context and Previous Judgments:** Supreme Court has previously upheld the Form 17C procedure. Judiciary interference in the electoral process is barred **under Article 329(b)** from notification issuance to result declaration.

## Supreme Court Ruling on Election Manifestos

### Why in News?

The Supreme Court recently stated that **there is nothing corrupt about promises made in a political party's manifesto** which eventually works out to the public's financial benefit.

### About Supreme Court Ruling on Election Manifestos

Case- The case pertains to an appeal against the electoral victory of **B.Z. Zameer Ahmed Khan, a Congress candidate, in the 2023 Karnataka Assembly election**. The petitioner had argued that the promises in Mr. Khan's party manifesto were corrupt. However, the court rejected this claim, describing the **promises as policy thresholds and projections**, not as corrupt practices.

### Judgement

1. The Supreme Court of India has stated that **making promises in election manifestos is not inherently corrupt**, even if these promises may lead to financial benefits for the public.

2. The court ruled that such commitments are not considered **"corrupt practices" by candidates**.

## Article 329(b) of the Constitution

### Why in News?

The Election Commission (EC) recently cited **Article 329(b) of the Constitution**, which prevents courts from interfering with the commission's operations during an ongoing election.

### About Article 329(b) of the Constitution

1. Article 329(b) is part of **Part XV of the Constitution**, which specifically addresses electoral issues.

#### 2. Judicial Role in Electoral Matters:

a) **Article 329(a)** restricts the judiciary from questioning the constitutionality of laws concerning electoral district boundaries or seat allocation.

b) **Article 329(b)** as amended by the **Constitution (19th Amendment) Act of 1966**, states that elections to either house of Parliament or state legislatures can only be challenged through an election petition as outlined by law.

3. **Legal Framework for Election Petitions:** The **Representation of the People Act, 1951**, specifies that high courts are the authorities empowered to hear and decide election petitions. Decisions from these petitions can be appealed to the Supreme Court.

#### 4. Supreme Court Interpretations

a) **Ponnuswami Judgment (1952):** The Supreme Court in "Ponnuswami v. Returning Officer, Namakkal" clarified that the term "election" in Article 329(b) encompasses the entire electoral process, from the notification of election to the declaration of results. It established that the courts cannot interfere with the electoral process once it has begun, until its completion.

b) **Venkatachalam vs. A. Swamickan (1999):** The Court determined that **Article 329(b) does not apply to matters related to Articles 191 and 193**, which deal with disqualifications and penalties for members of Parliament and legislative assemblies.

## Section 436-A of the Code of Criminal Procedure (CrPC)

### Why in News?

Sharjeel Imam who was convicted in the case of sedition and unlawful activity under the stringent **Unlawful Activities Prevention Act (UAPA)** was granted statutory bail but he will not be released from custody.

About Section 436A of Code of Criminal Procedure, 1973

1. Section 436A was added to the **Code of Criminal Procedure, 1973**, through an amendment in **2005**. It focuses on undertrials who individuals are still awaiting trial and not yet convicted.

2. According to this section, if an **undertrial has been detained for a period that equals half the maximum sentence possible for the crime they are accused of** (except for crimes punishable by death), then they are eligible to be released on bail.

3. This release can be on their personal promise to return to court, known as a **personal bond**, and may or may not include a surety, which is a guarantee by another person.



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4. However, the court can decide to keep the person in detention for longer than half the maximum sentence if there are good reasons to do so. These reasons must be written down after hearing from the Public Prosecutor.

### What are the protections for undertrials

**1. About Statutory Bail:** Statutory bail is granted under **Section 436-A of the Code of Criminal Procedure (CrPC)**. This provision mandates release **if an undertrial has served half the maximum period of the prescribed sentence for the offense** addressing the issue of long undertrial detentions.

2. It must be noted that **individual may continuously be detained** despite being granted bail in one case in case he/she is accused of multiple cases across various jurisdictions.

3. If **someone is accused of a bailable offense**, the court must grant them bail if they agree to pay bail bond. **For non-bailable offenses**, the decision to grant bail is up to the court.

4. Under Section 167(2) of the CrPC, default bail is granted if the police fail to file a charge sheet within the stipulated time (60 days for lesser offenses, 90 days for severe offenses). This provision underscores the rights of the accused against undue detention.

5. This helps to **prevent people from being held in jail for a long time without trial**. However, this only applies to crimes listed under the **Indian Penal Code (IPC)**.

6. For crimes under stricter laws like the UAPA, the police have more time to investigate.

Read More- [Default Bail](#)

## eMigrate Project

### Why in News?

A Memorandum of Understanding (MoU) has been **established between the Ministry of External Affairs (MEA), Ministry of Electronics and Information Technology (MeitY), and CSC eGovernance Services India Limited**.

### About Memorandum of Understanding to Streamline eMigrate Services via Common Services Centres

Source: PIB

1. The Ministry of External Affairs (MEA), the Ministry of Electronics and Information Technology (MeitY), and CSC eGovernance Services India Limited have entered into a Memorandum of Understanding.

**2. Purpose:** This MoU aims **to synergize efforts between MEA and CSC SPV to extend eMigrate services** through Common Services Centres across India.

**3. Objective:** A key objective is **to protect Indian citizens from potential exploitation by untrustworthy entities** as they seek employment abroad. The MoU is designed **to extend safe and legal migration channels at the grassroots level**.

### 4. Significance of the MoU:

**a) Impact on Migration:** The agreement seeks to enhance the migration process for Indians working abroad, reflecting the increasing number of workers and significant remittances they contribute.

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**b) Enhancing Digital Governance:** Integrating eMigrate services with CSC's digital platform aligns with the Digital India mission to provide accessible digital services nationwide, especially in rural and remote areas.

### About the eMigrate Project

1. The project primarily supports **blue-collar workers** destined for **Emigration Check Required (ECR) countries**.

2. **Objectives:** eMigrate is designed to streamline the emigration process online, bringing together foreign employers, registered recruitment agents, and insurance companies on a unified platform to ensure safe and legal migration.

### 3. Services to be Provided Through CSCs:

**a) Registration Support:** Assistance in registering applicants on the eMigrate portal via CSCs.

**b) Document Handling:** Help with uploading and processing necessary documents for applicants on the eMigrate portal.

**c) Service Booking:** Support in booking medical and other required services for migrant workers registered on the eMigrate portal.

**d) Awareness Campaign:** Increase awareness of eMigrate services among citizens throughout India.

**UPSC Syllabus: Polity and nation**

## UPSC Syllabus: Environment

### Sea otters.

#### Why in News?

A new study reveals that sea otters use tools like rocks to break open hard-shelled prey, which allows them to consume larger food items and minimizes tooth damage. The research also found that female otters use tools more frequently than males.

About sea otters

|       |  |
|-------|--|
|       | <b>n</b>   |
|       | belong to the <b>weasel family</b> and are <b>aquatic animals</b> . They are found along the <b>coasts of the Pacific North America and Asia</b> . |
|       | <b>spend most of their time in the water</b> but occasionally come ashore to sleep or rest.  |
| otics | <b>webbed feet</b> and <b>water-repellent fur</b> to stay dry and warm, with nostrils and ears that close in the                                   |
|       | typically consume about a quarter of their body weight daily, mainly foraging in <b>kelp forests and</b> <b>eds</b> .                              |

|      |  |
|------|--|
| Role | <p><b>ke Species:</b> The <b>health of sea otters is indicative</b> of the overall health of nearby ecosystems and ke species.</p> <p><b>em Impact:</b> They prey on sea urchins and with this sea otters <b>maintain the population balance of ures</b>. This prevents the overpopulation that can destroy kelp forests.</p> <p><b>rests:</b> They play a crucial role in <b>preserving kelp forests</b>, which are essential for the survival of rine species by providing shelter and food.</p> <p><b>rsity:</b> Their presence <b>helps sustain the biodiversity</b> and <b>overall health of marine ecosystems</b>.</p> |
| on   | <p><b>List:</b> Sea otters are classified as <b>Endangered</b>.</p>  |

## Venezuela first country to loose all its glaciers

### Why in News?

Venezuela has **become the first country in modern history to loose all its glaciers**. Scientists have reclassified the **Humboldt glacier**, which was Venezuela's last remaining glacier, as an ice field rather than a glacier.

### About Glacier

Source: Indian Express

- 1) Glaciers are **large, thick masses of ice** formed from accumulated snow over centuries. They are typically found in areas where **mean annual temperatures are near freezing**.
- 2) They develop from significant snow accumulations that do not fully melt. They flow slowly like rivers due to gravity.
- 3) According to the United States Geological Survey (USGS), the common size threshold to be classified as a glacier is about **10 hectares**

### Reason behind disappearance of Glacier

- 1) **Global Warming:** The primary cause of glacier melt is global warming. It increases temperatures and leads to ice melting.
- 2) **Human Impact:** Since the Industrial Revolution, **human activities**, especially the burning of fossil fuels, **have increased greenhouse gas emissions**. These gases trap heat in the atmosphere, contributing to global temperature rises.
- 3) **Recent Trends:** Notable temperature increases in regions like the Andes have been documented, with rates up to 0.10 degrees Celsius per decade over the last seventy years. Events like **El Niño also exacerbate warming**, leading to more rapid glacier melting.

### Impacts of Glacier Loss

- 1) **Water Resources:** Glaciers are vital sources of freshwater, especially during dry periods. Their loss means increased dependence on unpredictable rainfall for water.

**2) Ecological Impact:** Melting glaciers affect downstream water temperatures, which is crucial for aquatic species that require colder water to survive.

**3) Sea Level Rise:** Melting of glaciers contribute substantially to global sea level rise.

**4) Cultural and Economic Effects:** In places like Venezuela, glaciers form part of the cultural identity and are important for tourism and mountaineering. Losing them can have significant cultural and economic impacts.

## Critical Tiger Habitat (CTH)

### Why in the News?

Recently, the Supreme Court directed the Rajasthan government to close 68 mines that are operating within a 1-kilometer radius of the critical tiger habitat (CTH) of the Sariska reserve.

### About Critical Tiger Habitat (CTH)

Source: Times of India

**1. About Critical Tiger Habitat (CTH):** CWLHs are **designated areas within National Parks and Sanctuaries** deemed necessary to remain 'inviolable' for wildlife conservation.

They are also known as the **core areas of tiger reserves**. They are designated under the **Wild Life Protection Act (WLPA) of 1972**.

2. These areas are scientifically **identified to be maintained as inviolate zones for tiger conservation**, ensuring that the rights of the Scheduled Tribes and other forest dwellers are not affected.

3. It includes two main components within a tiger reserve:

**i) Core or Critical Tiger Habitat:** This area has **National Park** or **Sanctuary** status and is essential for the survival of tigers.

**ii) Buffer or Peripheral Area:** Surrounds the core habitat and provides additional support for tiger conservation.

4. The core habitat is specifically designated to ensure the long-term viability of tiger populations without compromising the rights of Scheduled Tribes or other forest dwellers.

5. Tigers are territorial animals, so their core habitat is distinct from the broader "critical wildlife habitat" applicable to other wild species.

### 6. Purpose and Criteria for CWLHs:

a) Identification of CWLHs is a **scientific process conducted on a case-by-case basis**, involving Forest Departments and scientific institutions.

b) Declaration of CWLHs involves **settling the rights of tribals and other traditional forest dwellers first**.

**7. Consultation and Consent Process:** The notification of CTH is done by the state government in consultation with the expert committee constituted for the purpose.

### About Sariska Tiger Reserve

## Factly Compilation for the Month of May 2024

|            |  |
|------------|--|
| <b>ons</b> |  |
|            | ted in the Alwar district of Rajasthan, within the Aravali Hills.<br>owned for being the first reserve globally to have successfully relocated tigers. |
|            | inally a royal hunting preserve for the Maharaja of Alwar. It was designated a wildlife sanctuary in<br>pgraded to a national park in 1979.            |
|            | el River flows through the Sariska Tiger Reserve in Rajasthan, India.  |
|            | terized by rocky landscapes, arid scrub thorn forests, grasslands, cliffs, and semi-deciduous forests.   |
|            | ated by dhok trees, covering 90% of the area. Other species present include salar, kadaya, gol, ber,<br>gal, bamboo, kair, adusta, etc.                |
|            | a diverse array of animals such as tigers, leopards, sambhar, chital, nilgai, four-horned antelope, wild<br>s macaque, langur, hyena, and jungle cats. |

### Bharals (Blue sheep) and Himalayan ibex Census

#### Why in News?

Wildlife authorities in Himachal Pradesh's high-altitude, cold desert district of Lahaul & Spiti have **initiated surveys to estimate the populations** of blue sheep (bharal) and Himalayan ibex. These are the primary prey for the iconic snow leopard.

#### About Bharals (Blue Sheep)

Source: Down to earth

|          |   |
|----------|---|
| <b>n</b> |   |
|          | Sheep, also known as <b>Bharal</b> , is a species of caprid (goat-antelope) <b>native to the high Himalayas</b> .<br>n "blue" refers to the <b>bluish sheen on its coat</b> , which can appear under certain lighting conditions  |
|          | Sheep inhabit the <b>mountainous regions of the Himalayas</b> .<br><b>prefer steep, rugged terrains</b> where they can easily navigate and escape predators.<br>reas often have <b>sparse vegetation and rocky outcrops</b> , providing them with ample hiding spots.   |
| stics    | ep have a robust build, with a body length of about 115 to 165 cm (45 to 65 inches).<br><b>re generally larger than females</b> and possess distinctive backward-curving horns that can grow<br>h (31 inches) in length.<br>at is <b>dense and woolly</b> , providing insulation against the cold, with a bluish-gray colour that |



## Factly Compilation for the Month of May 2024

|                     |   |
|---------------------|---|
|                     | with their rocky surroundings.  |
|                     | Sheep are <b>herbivores</b> , primarily grazing on <b>grasses, herbs, and shrubs</b> . In a harsh, high-altitude environment, they adapt their diet to the <b>seasonal availability of vegetation</b> . In the summer, they feed on fresh, green grasses. In winter, they survive on dry grasses and lichens.   |
| Distribution        | They are distributed across the mountainous regions of <b>Central and South Asia, including parts of China, Nepal, Bhutan, and Pakistan</b> . They are particularly abundant in the <b>Tibetan Plateau and the Himalayas</b> .  |
| Conservation Status | The International Union for Conservation of Nature (IUCN) lists the <b>Blue Sheep</b> as " <b>Least Concern</b> " due to their wide distribution and relatively stable population. However, they face <b>threats from habitat loss, poaching, and competition with livestock</b> for grazing areas. Conservation efforts focus on <b>habitat protection and reducing human-wildlife conflict</b> to ensure their populations remain stable. |

### About Himalayan ibex

|                            |   |
|----------------------------|---|
|                            | <b>Distribution</b>   |
|                            | Himalayan Ibex is a subspecies of the <b>Siberian Ibex</b> which is a type of wild goat found in the <b>mountainous regions of Central Asia</b> . They are known for their <b>impressive, curved horns and agility on steep terrains</b> .  |
|                            | Himalayan Ibex <b>inhabit high-altitude regions</b> , typically between 3,200 to 5,000 meters (10,500 to 16,400 feet) above sea level. They are found in <b>rocky, precipitous areas</b> where they can evade predators. Their habitat includes <b>alpine meadows, scree slopes, and cliffs, often in regions with sparse vegetation</b> .  |
| Behavioral Characteristics | They are <b>social animals and live in small groups, called herds</b> . During the breeding season, males compete for the attention of females and establish a hierarchy within the herd. Males are <b>larger than females</b> and <b>possess long, curved horns</b> that can reach up to 130 cm (51 inches) in length. Their coat is <b>thick and coarse</b> , providing insulation against the cold. Their <b>coloration varies seasonally</b> , from brown in summer to a darker, more insulated coat in winter. |
|                            | They are <b>herbivores</b> and primarily graze on <b>grasses, herbs, and shrubs</b> . They are <b>well-adapted to the limited food resources</b> of their high-altitude habitats, often feeding on whatever vegetation is available.  |

## Factly Compilation for the Month of May 2024

|    |   |
|----|---|
| n  | predominantly found in several regions of India, particularly in the states of <b>Jammu and Himachal Pradesh, and Uttarakhand</b> .<br>habit <b>high-altitude areas of the Himalayas</b> , including the Trans-Himalayan region, typically at ranging from 3,000 to 5,800 meters. |
| on | tly classified as a <b>"Near Threatened"</b> species on the IUCN Red List of Threatened Species.  |

## United Nations Forum on Forests

### Why in the News?

During the **19th Session of the United Nations Forum on Forests (UNFF19)**, delegates have been engaging in informal negotiations, concerning the draft texts of the High-Level Declaration.

### About United Nations Forum on Forests

Source: NDTV

| facts     | description   |
|-----------|---|
| t         | UNFF was formed in 2000 under the UN Economic and Social Council (ECOSOC).  |
|           | ns to support the <b>sustainable management, conservation, and development of forests worldwide</b> .   |
| bjectives | e 19th session declaration emphasizes <b>the importance of a high-level political commitment to protection</b> .<br>outlines <b>specific actions for effectively implementing the UN Strategic Plan for Forests (UNSPF)</b> UNFF and its stakeholders.  |
| embership | FF has <b>universal membership</b> , including all United Nations member states and specialized ies.<br><b>dia</b> is one of the <b>founding members of UNFF</b> .  |
| al<br>ngs | e Forum <b>convenes annually</b> at the UN Headquarters in New York.<br>brings together representatives from <b>all member states and forest-related agencies</b> .<br><b>odd years</b> , discussions focus on <b>technical matters</b> , while <b>policy issues</b> are addressed in <b>even</b> |

### About UN Strategic Plan for Forests 2017-2030

## Factly Compilation for the Month of May 2024

|             |  |
|-------------|--|
|             | n  |
|             | ffers a <b>comprehensive global framework</b> for actions aimed at sustainably managing all types of trees outside forests.  |
|             | y goal is <b>to halt deforestation and forest degradation</b> .  |
| <b>with</b> | <b>th key global initiatives</b> , the UNSPF supports the implementation of the 2030 Agenda for Sustainable Development, the Paris Agreement under the UN Framework Convention on Climate Change, the Convention on Biological Diversity, and the UN Convention to Combat Desertification. |
| <b>ion</b>  | for a <b>structured framework for coordinating forest-related efforts</b> across the UN system and encourages collaboration and synergy among UN bodies and partners. Acting as a reference point, it enhances <b>coherence in forest-related work</b> at all levels.                      |

### Humboldt Glacier

#### Why in the News?

The International Cryosphere Climate Initiative (ICCI) reported that Venezuela's last glacier Humboldt or La Corona in the Andes is now too small to qualify as a glacier.

#### About Humboldt Glacier

- 1. About Humboldt Glacier:** It is also known as **Sermersuaq Glacier** which is one of the major glaciers in northern Greenland. It borders the Kane Basin in **North West Greenland**.
2. It holds the **distinction** of being the **widest tidewater glacier** in the Northern Hemisphere.
3. The **standard size** for an area to be considered a glacier is **approximately 10 hectares**.
4. The **Humboldt glacier in Venezuela** has **diminished to less than 2 hectares in size**, prompting a downgrade in its classification from a glacier to an ice field.

#### Current State of the glacier

Venezuela has once hosted 6 glaciers in the Sierra Nevada de Mérida, now it has none. The last Humboldt glacier melted faster than expected and has been reclassified as an ice field due to its reduced size.

#### Causes of Melting

## Factly Compilation for the Month of May 2024

**a) Climate Impact:** Experts attribute the **accelerated melting to rising temperatures** driven by climate change and the recent El Niño phenomenon, which exacerbates the warmth.

**b) Lack of Monitoring:** Political turmoil in Venezuela has hindered consistent scientific monitoring of the glacier.

The Venezuelan government attempted to slow the melting by **installing a thermal blanket over the glacier**, but experts consider this measure ineffective.

### About Global Context and Future Outlook

1. The **International Cryosphere Climate Initiative (ICCI)** noted that **Venezuela is likely the first modern nation to lose all its glaciers**. Other countries at risk of becoming glacier-free include Indonesia, Mexico, and Slovenia.
2. The **high-mountain region of Asia** has also seen significant glacier loss due to record high temperatures and dry conditions.
3. Experts warn that **glacier melting may be irreversible**, stressing the importance of protective measures to preserve remaining glaciers.

### About International Cryosphere Climate Initiative

- 1. Formation:** It was **established in 2009** following the COP-15 summit in Copenhagen. ICCI is a pivotal network aimed at **cryosphere preservation**.
- 2. Mission:** The initiative involves a **collaboration of senior policy experts and researchers** who work closely with governments and various organizations.
- 3. Goal:** The goal is **to develop and implement strategies** that help preserve as much of Earth's cryosphere as possible.
- 4. Focus Areas:** ICCI's efforts concentrate on the unique climate dynamics affecting three key cryosphere regions: **the Arctic, the Antarctic, and high mountain areas**.
5. The organization plays a **critical role in adding urgency** to global climate change efforts, particularly concerning CO<sub>2</sub> and other greenhouse gases. It emphasizes the swift and profound global implications of cryosphere warming.

## Soil nailing

### Why in the News?

The State Highways Department of Tamil Nadu is carrying out Soil Nailing exercise. This project called 'slope stabilization using soil nailing and Hydroseeding method' is being conducted along major roads in the Nilgiris area of Tamil Nadu.

### About Soil Nailing

Source: CivilDigital

- 1. About Soil nailing:** It is a **geotechnical engineering technique** that involves the insertion of reinforcing elements into the soil in a specified area to strengthen it.
- 2. Material:** It involves **drilling steel tendons into the soil** and grouting them in place to form a composite structure akin to a gravity wall.
- 3. Applications:** It is commonly used for **stabilizing slopes and landslides, supporting excavations, and repairing existing retaining walls.**
- 4. Methods of application:**

| Nailing  | Uses   |
|--|--|
| <b>and</b> inserted into pre-drilled holes and then filled with grouting material to the soil, forming a composite mass similar to a gravity wall. | <b>slopes, supporting</b>                      |
| <b>Soil</b> driven into the soil for temporary stabilization. It is a faster method but corrosion protection for the steel.                        | <b>slope stabilization</b>                     |
| <b>Soil</b> low bars that are drilled into the soil; grout is injected through these. This method is faster than driven nails.                     | <b>excavations, stabilizing</b>                |
| <b>and Soil</b> are installed in holes created by jet grouting, then filled with concrete. Particularly used in eroding soils.                     | <b>existing retaining walls, eroded slopes</b> |
| <b>Soil</b> are launched into the soil using an <b>air compression mechanism</b> in order to rapidly place nails into position.                    | <b>stabilization in urgent</b>                 |



## UPSC Syllabus: Environment & Ecology

### Sariska Tiger Reserve

#### Why in the News?

Recently, a sailing yacht was sunk by an unspecified number of orcas after they rammed it in the waters of Morocco, near the Strait of Gibraltar.

#### About Sariska Tiger Reserve

Source: Times of India

| Aspects   | Description   |
|-----------|---|
| Location  | It is situated in the Alwar district of Rajasthan, within the Aravali Hills. It is renowned for being the first reserve globally to have successfully relocated tigers. |
| History   | It was originally a royal hunting preserve for the Maharaja of Alwar. It was designated a wildlife sanctuary in 1975 and upgraded to a national park in 1979.           |
| Geography | The Aravali River flows through the Sariska Tiger Reserve in Rajasthan, India.  |
| Climate   | It is characterized by rocky landscapes, arid scrub thorn forests, grasslands, cliffs, and semi-deciduous forests.  |
| Flora     | It is dominated by dhok trees, covering 90% of the area. Other species present include salar, kadaya, gol, ber, palash, bamboo, kair, adusta, etc.                      |
| Fauna     | It is home to a diverse array of animals such as tigers, leopards, sambhar, chital, nilgai, four-horned antelope, wild boar, macaque, langur, hyena, and jungle cats.   |

### Leopard Cat

#### Why in the News?

A leopard cat was sighted in Maharashtra's [Pench Tiger Reserve](#) for the first time.

#### About Leopard Cat

| Aspects | Description   |
|---------|---|
| About   | Leopard Cat ( <i>Prionailurus bengalensis</i> ) is a member of the Felidae family. It is a forest-dwelling cat. |

## Factly Compilation for the Month of May 2024

|                     |   |
|---------------------|---|
| Features            | <ol style="list-style-type: none"><li>1. It is noted for its <b>leopard-like coloration</b>.</li><li>2. It exhibits <b>varied coloration</b> ranging from pale tawny to yellow, red, or grey, with distinctive black stripes.</li></ol>   |
| Distribution        | It is widely distributed across Asia, from the Amur region in the Russian Far East to the Sunda Islands of Indonesia.   |
| Habitat             | <ol style="list-style-type: none"><li>1. Leopard cats inhabit agriculturally utilized areas but show a preference for forested environments.</li><li>2. They thrive in various habitats, including tropical evergreen rainforests and low-lying plantations, as well as subtropical deciduous and coniferous forests situated in the foothills of the Himalayas, particularly at altitudes exceeding 1000 meters.</li></ol> |
| Behavior            | They are <b>solitary and nocturnal carnivores</b> .   |
| Conservation Status | They are classified as <b>Least Concern</b> on the IUCN Red List.   |

### Microbes producing more methane than fossil fuel- Study

#### Why in the News?

A recent study has shown that methane emissions from fossil fuels decreased from 1990 to the 2000s and have remained steady since then. The microbes have now emerged as the main source of methane.

#### Findings of the study

**1. Microbes as the primary source of new methane-** The recent study has revealed that microbes are the primary sources of new methane in the atmosphere. **Anaerobic archaea** has been identified as potential major sources of atmospheric methane.

**2. Location of the Methane Releasing Microbes-** These microbes (**methanogens**) thrive in **oxygen-deficient environments**. They can be found in various settings, which includes the **digestive tracts of animals, wetlands, rice paddies, landfills**, and the **sediments of lakes and oceans**.

#### About Methane Emissions

##### 1. Global Warming Potential of Methane-

a) Methane is the **second most abundant anthropogenic greenhouse gas** after carbon dioxide (CO<sub>2</sub>). However, it has a higher warming potential over shorter periods.

b) Over a century, methane's global warming potential is **28 times greater than CO<sub>2</sub>**.

**2. Sources of Methane emission:** It falls into two main categories:

a) **Biogenic Methane:** It is produced by microbial action, particularly by methanogens.

## Factly Compilation for the Month of May 2024

b) **Thermogenic Methane:** It is released during the extraction of fossil fuels (natural gas or oil) from deep within the Earth's crust.

**3. Action to address methane emission:** Policymakers have recently focused on addressing methane emissions to combat global warming. The '**Global Methane Pledge**' was launched at the **U.N. climate talks in 2021 to reduce methane emissions.**

### Bhadra Tiger Reserve

#### Why in the News?

Recently, there has been an increase in the number of visitors to the Bhadra Tiger Reserve for safaris. It is important for tourists to take proper precautions to avoid disturbing this environmentally sensitive area.

#### About Bhadra Tiger Reserve



Source: Wikipedia

| Specifications | Details |
|----------------|---------|
|                |         |

## Factly Compilation for the Month of May 2024

|                   |  |
|-------------------|--|
| <b>Location</b>   | <ul style="list-style-type: none"><li>) It is located in the midst of the <b>Western Ghats region of Karnataka</b>.</li><li>) It is surrounded by <b>hill ranges of Mullaianagiri, Hebbegiri, Gangegiri, and Babaudangiri</b>.</li><li>) It is the first official tiger reserve to finish a <b>successful village relocation programme and success story in wildlife conservation</b>.</li><li>) The Bhadra Sanctuary was declared <b>India's 25th Project Tiger in 1998</b> and listed its name in the list of <b>national bird sanctuaries of Karnataka</b>.</li></ul> |
| <b>Rivers</b>     | It is also located near the <b>Bhadra river and its tributaries</b> such as Somavahini, Thadabehalla, and Odirayanahalla. A dam has been built across the <b>Bhadra river near Chakkavalli</b> .   |
| <b>Vegetation</b> | Southern Tropical Dry Deciduous Dry Teak, Northern Tropical Dry Deciduous Mixed Forest, Dry Deciduous Scrub Forest, Boswellia Forest, Dry Bamboo Brakes, and Anogeissus pendula Forest are the major forest types found in the Reserve.  |
| <b>Flora</b>      | Teak, Rosewood, Mathi, Honne, Nandi and many medicinal plants etc.   |
| <b>Fauna</b>      | Tiger, Leopard, Leopard cat, Dholes, Indian Civet, ungulates like Gaur, Sambar and Barking Deer are commonly found.  |

## Carbon Farming

### Why in the News?

**Amid growing environmental challenges** and the **quest for climate-resilient sustainable agriculture**, the practice of carbon trading in the agriculture sector has become important around the world.

The carbon farming approach aims to optimize carbon capture by utilizing practices that enhance the removal of CO<sub>2</sub> from the atmosphere and its storage in plant material and soil organic matter.

### About carbon farming:

- 1. About Carbon farming:** Carbon farming is an **agricultural method** that **integrates the management** of carbon capture and storage into farming practices.
- 2. Objective:** It is designed **to reduce greenhouse gas emissions**, enhance the carbon content of soil, and improve overall agricultural productivity and ecosystem health.
- 3. Strategies involved:** Carbon farming can involve **multiple strategies** and each practice is **tailored to fit different agricultural landscapes** and climatic conditions, making carbon farming versatile and widely applicable.

### About Carbon Farming Practices and Their Benefits

- 1. Rotational Grazing:** It involves rotating livestock across different pastures. This technique helps to **maintain soil health** and **increase carbon sequestration** in the soil.

## Factly Compilation for the Month of May 2024

**2. Agroforestry Practices:** It is a **land use practices** where trees or shrubs are grown around or among crops or pastureland.

**a) Silvopasture:** It involves **integrating trees, pasture, and livestock**. It sequesters carbon and also diversifies farm income.

**b) Alley Cropping:** It involves planting rows of trees or shrubs between crops to provide shade, reduce erosion, and enhance carbon storage.

### 3. Conservation Agriculture:

**a) Zero Tillage:** It **reduces soil disturbance** to maintain soil structure and organic content.

**b) Crop Rotation and Cover Cropping:** It involves **alternating crops** and using cover crops to improve soil health and biodiversity.

**c) Crop Residue Management:** It includes practices like **stubble retention** and composting help enhance soil organic matter.

**4. Integrated Nutrient Management:** This involves **using organic fertilizers** and compost to promote **soil fertility** and reduce greenhouse gas emissions.

### 5. Agro-Ecological Approaches:

**a) Crop Diversification and Intercropping:** These practices **improve ecosystem resilience** by diversifying plant species, which helps in pest control and nutrient balance.

**6. Livestock Management:** It involves **optimizing feed quality, managing animal waste, and using rotational grazing** to reduce methane emissions and increase carbon storage in pastures.

**7. Management of Excessive carbon through additional carbon sinks-** The launch of the '4 per 1000' initiative during the **COP21 climate talks in 2015** in Paris highlights the particular role of sinks in mitigating greenhouse-gas emissions. As the **oceans and the atmosphere are filled with carbon**, and they approach their saturation points, carbon farming can help in effective sequestration.

### Challenges of Carbon Farming

**1. Geographical and Climatic Limitations:** **Optimal carbon sequestration** requires long growing seasons and sufficient water, and it is thus **challenging in hot, dry areas** where water is scarce.

**2. Soil and Biodiversity Constraints:** Effective carbon sequestration is hindered by **poor soil quality** and **limited biodiversity**.

**3. Water Resource Management:** Plant growth is restricted in **arid region due to water scarcity**. This impacts carbon sequestration and makes water-intensive practices like cover cropping impractical.

**4. Economic and Financial Barriers:** Adopting carbon farming can be **costly initially and thus deter its adoption among small-scale and resource-poor farmers**.

**5. Policy Support and Community Engagement:** Effective carbon farming requires robust policy support and active community involvement for successful adoption and scalability.



## India Becomes Third Largest Producer of Solar Power

### Why in News

According to a report by international energy analytics agency Ember, **India has overtaken Japan to become the world's third-highest producer of solar power in 2023**. India generated 113 billion units (BU) of solar power in 2023 compared to Japan's 110 BU.

### What is the Status of Installed Power and Solar Power in India

- 1. India's ranking in terms of Installed Power Capacity-** The installed power capacity includes both renewable and non-renewable energy. In terms of installed capacity, India is at 5th position in the world.
- 2. Gap in Solar Power production due to demand-supply mismatch-** According to NITI aayog, while **solar power constitutes 18% of India's total installed electricity of 442 GW**, it **contributes to only 6.66% of the power production**. This reflects a gap between the potential and actual solar power produced. This gap in solar power produced is dependent on country's power demand and local circumstances.

### Who are the Leaders in Solar Power Production

- 1. China tops in the Solar Power Production-** China is the leading producer of solar power in the world, with **584 BU of solar power in 2024**. It is more than the next four countries combined, that is **the United States, India, Japan, and Germany**.
- 2. US is at the Second Spot-** India needs to more than double its current solar production to overtake USA, which is at the second spot with 228 BU of Solar Production.

### Status of Renewable energy in the World

- 1. Expansion of renewable energy-** Renewable energy's share in the global electricity production has expanded from **19% in 2000 to 30% in 2023**. This is driven mainly by an increase in solar and wind power.
- 2. China is the main driver of the increase-** China alone accounts for **51% of the additional global solar generation** and **60% of new global wind generation in 2023**.
- 3. Generation of electricity from low Carbon Sources-** World generates **40% of its electricity from low carbon sources**, which includes renewable sources and nuclear Power.

## Sonai Rupai Wildlife Sanctuary

### Why in the News?

The National Green Tribunal (NGT) has directed the Chief Secretary of Assam to identify officials who permitted the construction of polling stations, schools, and other structures within a wildlife sanctuary and a reserve forest, violating the Forest (Conservation) Act of 1980.

### About Sonai Rupai Wildlife Sanctuary

| Aspect | Details |
|--------|---------|
|        |         |

## Factly Compilation for the Month of May 2024

|                                     |   |
|-------------------------------------|---|
| <b>Location</b>                     | <ul style="list-style-type: none"> <li>1. It is a protected area located in the Indian state of <b>Assam</b>.</li> <li>2. It is situated in the <b>foothills of the Eastern Himalayas</b>.</li> <li>3. It is known as the <b>"Jewel of Assam"</b>.</li> </ul>   |
| <b>Neighbouring protected areas</b> | It is bordered by the <b>Pachnoi River</b> to the west, <b>Jia Gabharu</b> to the east, the <b>Doimara Reserve Forest</b> in Arunachal Pradesh to the north, and the revenue village and <b>Charduar Reserve Forest</b> of Sonitpur to the south.   |
| <b>Status</b>                       | It was declared a wildlife sanctuary in 1998.   |
| <b>River flowing through</b>        | There are four perennial rivers that flow through the sanctuary: <b>Dolsiri, Gabharu, Belgeli, and Belsiri</b> . During the rainy season, several wetlands known as <b>"bheels"</b> can also be seen.   |
| <b>Flora</b>                        | <ul style="list-style-type: none"> <li>1. The forests type in the sanctuary comprises <b>tropical evergreen, semi-evergreen and moist deciduous forests</b>.</li> <li>2. Hollang, Mekai, Dhuno, Udiyam, Nahar, Samkothal, Bheer, Hollock, Nahor are found in the sanctuary.</li> </ul>  |
| <b>Fauna</b>                        | <ul style="list-style-type: none"> <li>1. The sanctuary is primarily known for its <b>Elephant and Indian bison populations</b>. It hosts a variety of other animals including <b>deer, the one-horned rhinoceros, leopards, tigers, and some rare species of cats</b>.</li> <li>2. The avian life in the sanctuary features endangered species such as the <b>White Winged Wood Duck</b>, along with commonly seen birds like <b>woodpeckers, hill mynas, Indian rollers, nightjars, horned owls</b>, and more.</li> </ul> |

## Foot Rot Disease

### Why in the news?

Ludhiana's Punjab Agricultural University (PAU) has developed a **biocontrol agent, Trichoderma asperellum**, to combat foot rot disease in Basmati rice varieties. Foot rot is a prevalent issue that reduces yields and threatens the state's export prospects.

### About Foot Rot Disease

Source: Agriculturistmusa

| Aspects            | Description  |
|--------------------|--|
| <b>What is it?</b> | Foot Rot is a <b>fungal disease affecting Basmati rice</b> , most vulnerable at the seedling stage and potentially after transplantation if infected seedlings are used. |

## Factly Compilation for the Month of May 2024

|                                  |   |
|----------------------------------|---|
| <b>Causal Agent</b>              | The disease is caused by the <b>fungus <i>Fusarium verticillioides</i></b> . It is both soil and seed-borne. It spreads through the plant's roots and colonizes the stem base.  |
| <b>Symptoms</b>                  | Infected seedlings initially turn <b>pale yellow</b> , then elongate, dry up, and often die.  |
| <b>Current Treatment Methods</b> | <p><b>a) Biological:</b> Seedlings are treated with <b><i>Trichoderma harzianum</i></b> before sowing and transplantation to prevent fungal growth.</p> <p><b>Note:</b> It is a <b>biocontrol agent</b> that provides an <b>eco-friendly alternative to conventional pesticides</b>, helping in disease management while reducing environmental impact.</p> <p><b>b) Chemical:</b> Seeds are <b>treated with fungicides</b> such as Sprint 75 WS (a combination of carbendazim and mancozeb) before sowing. However, these chemical treatments can negatively affect the soil and pose toxicity risks to consumers.</p> |
| <b>Regulatory Action</b>         | The <b>fungicide carbendazim</b> has been <b>banned in Punjab</b> due to concerns over high residue levels left in crops.   |

### GSAP SKILLS Platform

#### Why in News?

Recently, the Fourth meeting of the Subsidiary Body on Implementation, Convention on Biological Diversity launched the GSAP SKILLS Platform.

#### About GSAP SKILLS Platform

| Aspects          | Description   |
|------------------|---|
| <b>About</b>     | The Global Species Action Plan (GSAP) SKILLS platform brings the content of GSAP online, allowing for real-time updates of technical tools and resources.   |
| <b>Purpose</b>   | It aims to <b>facilitate global collaboration and partnerships</b> . It connects decision makers, species conservation practitioners, and experts at all levels.  |
| <b>Objective</b> | <ol style="list-style-type: none"> <li>1) It provides <b>real-time updates on technical tools</b> and resources to ensure they remain accessible and relevant.</li> <li>2) Each <b>Global Biodiversity Framework</b> target includes: <ol style="list-style-type: none"> <li>a) A brief summary and rationale for species conservation interventions, actions, and sub-actions.</li> <li>b) Information on actors and technical tools and resources for those actions.</li> <li>c) Facilitates the scaling-up of implementation efforts.</li> </ol> </li> </ol> |

## Factly Compilation for the Month of May 2024

|                   |   |
|-------------------|---|
| <b>Managed by</b> | 1) It is <b>managed proactively by IUCN</b> to meet the needs of governments and stakeholders in taking actions for species conservation.<br>2) It is also supported by the <b>Ministry of Environment, Republic of Korea</b> , and the Tech4Nature Initiative launched by IUCN and Huawei in 2020. |
|-------------------|---|

### About Global Species Action Plan (GSAP)

1. The Global Species Action Plan (GSAP) is an initiative designed to support the **implementation of the Kunming-Montreal Global Biodiversity Framework (GBF)** and combat the growing loss of biodiversity worldwide.
2. It outlines the necessary actions **to effectively conserve and sustainably use wild species**.
3. The GSAP includes measures such as **integrating species data into spatial planning** and **establishing wildlife corridors** to facilitate animal migration.
4. **Goals:** Its goal is to **outline strategic interventions and actions** to conserve and sustainably manage species and ensure equitable benefits.

## Kendu Leaf

### Why in News?

Villagers in Odisha's Koraput who started the **initiative of seeking kendu leaf under the Community Forest Rights (CFR)**, are now struggling for approvals from the forest department.

### About Kendu Leaf

1. **About:** It is a species of **flowering tree in the family Ebenaceae**. It is **native to India and Sri Lanka**. In various parts of India, it is also known as tendu leaf.
2. **States where it is produced:** **Madhya Pradesh, Chhattisgarh, Odisha, Andhra Pradesh, Jharkhand, Gujarat, and Maharashtra**.
3. **Uses:** It is used in multiple ways:
  - a) The Kendu leaves are **used to wrap bidis**, a popular smoke among the locals. Tribals living in remote forests, pluck it and **sell them in the market to earn their livelihood**.
  - b) **Traditional medical practitioners** use it **to treat malaria, diarrhoea, and dysentery**. Due to their antimicrobial properties, the leaves are applied to cuts and bruises as well.

### Kendu Leaf in Odisha:

1. It is called the **green gold of Odisha**. It is a **nationalized product**, like bamboo and the sal seed. It is one of the **most important non-wood forest products in Odisha**.
2. **Odisha is the third-largest producer** of tendu leaves, after Madhya Pradesh and Chhattisgarh.

## Himalayan serow

### Why in News?

Recently, Himalayan serow was seen for the first time in the central region of Nameri National Park and Tiger Reserve.

### About Himalayan serow

Source: Times of India

| Aspects                  | Description  |
|--------------------------|--|
| About                    | <ol style="list-style-type: none"><li>1. Himalayan serow is a subspecies of the mainland serow (<i>Capricornis sumatraensis</i>).</li><li>2. It resembles a cross between a goat, a donkey, a cow, and a pig</li></ol>                                 |
| Habitat                  | <ol style="list-style-type: none"><li>1. They are found at high altitudes between 2,000 metres and 4,000 metres.</li><li>2. They are known to be found in the eastern, central, and western Himalayas but not in the Trans Himalayan region.</li></ol> |
| Physical Characteristics | It is a medium-sized mammal with a large head, thick neck, short limbs, long, mule-like ears, and a coat of dark hair. It is a very elusive animal.  |
| Diet                     | Himalayan serows are herbivores animals.   |
| Distribution             | <ol style="list-style-type: none"><li>1. There are several species of serows in the world. All of them are found in Asia.</li><li>2. However, they are restricted to the Himalayan region.</li></ol>   |
| Conservation Status      | <b>IUCN Red List:</b> Vulnerable<br><b>CITES:</b> Appendix I<br><b>The Wildlife Protection Act, 1972:</b> Schedule I   |

### About Nameri Tiger Reserve

| Aspects | Description  |
|---------|--|
| About   | <ol style="list-style-type: none"><li>1. Nameri Tiger Reserve is located in the northern area of Sonitpur district in Assam, close to the foothills of Arunachal Pradesh.</li><li>2. It shares its northern boundary with Pakke Tiger Reserve in Arunachal Pradesh, creating a continuous habitat.</li><li>3. The reserve has been carved out of two protected areas: Nameri National Park &amp; Sonai-Rupai Wildlife Sanctuary, and two Reserve Forests: Naduar Reserve Forest &amp; Balipara Reserve Forest.</li></ol> |



|            |   |
|------------|---|
| River      | It is defined by the <b>Jia-Bhoreli river on the west and the Bor-Dikorai river on the east.</b>  |
| Vegetation | The reserve's vegetation includes <b>tropical evergreen and semi-evergreen forests, moist deciduous forests, cane brakes, and some open grassland</b> patches along the rivers.   |
| Fauna      | 1. Its fauna is diverse and notable, especially for the <b>presence of the rare white-winged wood duck.</b><br>2. Other species include the <b>leopard cat, common otter, black giant squirrel, Indian mongoose, large clawed shrew, Indian flying fox, slow loris, Assamese macaque, and Rhesus macaque.</b> |

## UPSC Syllabus: Indian Economy

### Balanced fertilization

#### Why in the News?

The promotion of Balanced fertilisation will be a crucial agricultural priority for the incoming government post Lok Sabha elections. Balanced fertilisation discourages farmers from applying **excessive of fertilisers having only primary nutrients in high concentrations**, such as urea, di-ammonium phosphate (DAP) or muriate of potash (MOP).

#### About Balanced fertilisation

##### Source: Fertilizers Europe

**1. About Balanced fertilization-** Balanced fertilization refers to the process of **supplying essential nutrients** to crops in the right proportion. The nutrients are supplied taking into consideration the soil type and the specific requirements of the crop at different growth stages.

##### 2. Essential Nutrients Supplied-

- Primary nutrients** which include **nitrogen (N), phosphorus (P), and potassium (K)**
- Secondary nutrients** which include **Sulfur (S), calcium, and magnesium.**
- Micronutrients** which include **iron, zinc, copper, manganese, boron, and molybdenum.**

#### Challenges related to Balanced fertilisation

**1. Price Controls leading to lower prices of single nutrient rich fertilisers-** Restoration of price controls **on non-urea fertilizers** like the Diammonium phosphate (DAP) has led to lowering of its prices as compared to other nutrient balanced complex fertilisers like 10:26:26:0 and 12:32:16:0 NPKS complex fertilisers.

**2. Vague fixing of prices-** The fertiliser prices are vaguely fixed without considering the market demand and supply. **For ex-** The **Muriate of Potassium (MOP) price** is not feasible either for the farmers for direct application in the field nor to the fertiliser firms to make complex fertiliser. Hence, it is not being used in the farms, leading to potassium deficiencies.

#### Steps which can be taken to promote Balanced fertilisation

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**1. Rationalization of DAP and MOP prices-** The recent reduction in landed prices of imported urea, DAP, and MOP due to **present geopolitical situation** such as Russia's invasion of Ukraine should be used by the government to rationalize MRPs of fertilizers domestically and promote balanced plant nutrition.

**2. Bringing Urea under NBS Scheme-** The government can leverage lower international prices to encourage balanced plant nutrition **by potentially bringing urea under the Nutrient-Based Subsidy (NBS) scheme.**

**3. Crop-specific usage of fertiliser-** The fertiliser usage must be restricted to particular crops. For ex-DAP usage **should be restricted to rice and wheat.**

**4. Granular form of fertiliser-** The fertilisers must be marketed in granular forms as it prevents adulteration and ensure slower release of nutrients. (SSP in granular form slows release of Phosphorous)

### **Scheme launched by the Govt to promote Balanced Fertilization**

The Government launched the Nutrient Based Subsidy (NBS) Scheme to promote balanced fertilization in the country.

**1. About NBS:** The nutrient-based subsidy (NBS) system was **instituted in April 2010** to **promote balanced fertilization.**

**2. Provision:** Under it, the **government fixed a per-kg subsidy for N, P, K and S.**

**3. Aim of the NBS:** This system aimed **to encourage product innovation and steer farmers towards using complex fertilizers** that contain a balanced mix of nitrogen (N), phosphorus (P), potassium (K), sulfur (S), and other nutrients in appropriate proportions.

**4. Impact of NBS:** Between **2009-10 and 2011-12**, there was a **decline in the consumption of DAP and MOP fertilizers**, while there was an **increase in the usage of NPKS complexes and single super phosphate (SSP).**

**5. Reason for failure:** The Nutrient-Based Subsidy (NBS) scheme **failed due to its exclusion of urea.** Despite the introduction of NBS, **urea consumption continued to rise steadily** as its maximum retail price remained controlled with only marginal increase.

## **Bima Vistaar**

### **Why in the News?**

The Insurance Regulatory and Development Authority of India (Irdai) has proposed Bima Vistaar. Bima Vistaar is an ambitious all-in-one affordable mass product which aim to target the rural areas of the country.

### **About Bima Vistaar**

**1. About Bima Vistaar:** It is a **comprehensive insurance product** that combines **life, health, accident, and property coverage.** It is provided by both public and private insurance companies.

**2. Initiated by:** This is initiated by the **Insurance Regulatory and Development Authority of India (IRDAI)** as part of its **Vision 2047.**

**3. Aim:** The policy aims to address the essential insurance needs of India's rural population with a single, affordable product. It has been made accessible at Rs 1,500 per policy.

**4. Features:**

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a) This product forms part of IRDAI's Bima Trinity initiative. It includes:

- i) **Bima Sugam** which includes **online insurance marketplace**
- ii) **Bima Vistaar** which is a **comprehensive bundled policy**
- iii) **Bima Vaahak** which works as a **distribution channel**

IRDAI is banking on the **troika** to help further its goal of 'Insurance for All' by 2047.

**b) It is a benefit-based policy:** This means that if the event were to occur, the pre-decided amount (the sum insured) will be paid out to the policyholder, or her nominees and the policy will cease to exist.

**c) Policy cost:** The policy offers **life cover for Rs 820, health cover for Rs 500, personal accident cover for Rs 100, and property cover for Rs 80**. If taken as a family floater, it costs Rs 2,420, with an extra Rs 900 for additional family members.

**d) Benefits of the Bima Vistaar Policy:**

**i) Increased Insurance Penetration:** The policy facilitates the **expansion of insurance coverage in rural areas of India**, promoting financial security among underserved populations.

**ii) Affordable Insurance:** With competitive pricing, the Bima Vistaar policy offers accessible insurance solutions to individuals and families and thus ensuring **reliable coverage at reasonable costs**.

**iii) Promotion of Financial Inclusion:** By encouraging insurance investment and accessibility, this initiative contributes to **broader financial inclusion**, empowering more people to safeguard their financial future.

**iv) Enhanced Distribution and Adoption:** The policy incentivizes agents to promote and sell Bima Vistaar policies to **wider distribution and adoption of insurance products** particularly in rural and underserved communities.

**State of Insurance Sector in India:**

1. According to the Economic Survey 2022-23, **India's life insurance density increased from USD 11.1 in 2001 to USD 91 in 2021**.

2. The Indian insurance market is poised to **emerge as one of the fastest-growing globally in the coming decade**. India is currently the **10th largest insurance market globally** and is expected to rise to the **6th position by 2032**.

Read more: [All-in-one policy plan to spread insurance in India](#)

## Standalone Primary Dealers to borrow in foreign currency

**Why in the news?**

The Reserve Bank of India (RBI) has recently allowed **standalone primary dealers (SPDs)** to borrow in foreign currency from their parent companies and entities authorized by it.

Standalone primary dealers **will also be allowed to access overdraft facilities in nostro accounts** solely for operational use.

**NOTE- Nostro account-** A nostro account is a bank account held by a domestic bank in a foreign country's currency. This account is primarily used to facilitate foreign exchange and international trade transactions.

### About Primary Dealers

**Introduction**– In 1995, the Reserve Bank of India (RBI) introduced the Primary Dealers (PDs) system in the Government Securities Market. This system includes independent entities specifically involved in Primary Dealer activity.

**Definition**– A primary dealer is an RBI-registered entity that is authorized to buy and sell government securities. There are 2 types of primary dealers in India – standalone primary dealers and bank primary dealers.

### About Standalone Primary Dealer

**Description**– They are either subsidiaries of scheduled commercial banks or entities incorporated abroad or those incorporated under the Companies Act.

**Status**– They are registered as non-banking financial companies. As of March 31, 2023, there were 7 SPDs registered as non-banking financial companies (NBFCs) with the RBI.

### What are the regulatory guidelines released by the RBI regarding SPDs?

- 1) Borrowings by SPDs must adhere to prescribed limits for foreign currency.
- 2) If withdrawals go over the limit and aren't fixed within 5 days, they need to be reported to the RBI within 15 days from the end of the month when the limits were exceeded.
- 3) The RBI has included SPDs within the scope of norms for risk management and interbank dealings.
- 4) **Capital Requirements and Reporting**– The board of authorized dealers can set the net overnight open position limit (NOOPL) to calculate the capital charge on forex risk. This limit shouldn't go over 25% of the dealer's total capital.

### What is the significance of the recent move of the RBI?

- 1) It would help SPDs in managing funding for their foreign exchange business.
- 2) It would facilitate and smoothen foreign exchange operations for primary dealers.
- 3) It will allow SPDs to fund settlement failures in forex transactions by borrowing from their parent companies.

Read more- [T+1 settlement system: how it works, and how it will help investors](#)

## Swing trading

### Why in the News?

The stock market has experienced significant volatility recently due to the ongoing Lok Sabha elections. Amidst these ups and downs, swing trading has become a popular topic online as various stocks have shown marked fluctuations.

### About swing trading

| Aspects                    | Description   |
|----------------------------|---|
| <b>About Swing trading</b> | Swing trading involves holding stocks for more than a day, usually for several days or weeks. This trading style is widely used in the Indian stock market. |
| <b>Objective</b>           | i) The primary goal of swing trading is to profit from short- to medium-term fluctuations in stock prices.  |

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|                                     |  |
|-------------------------------------|--|
|                                     | ii) Swing traders capitalise on both upward and downward movements in the market, seeking to take advantage of trends and momentum.  |
| <b>Strategy</b>                     | Swing traders employ technical analysis to forecast price changes and identify trading opportunities. Common Strategy include <b>trend following</b> (predicting market direction) or <b>mean reversion</b> (buying or selling based on historical price data).  |
| <b>How does swing trading work?</b> | i) Swing traders focus on stocks with <b>high trading volume and price volatility</b> .<br>ii) They use <b>fundamental analysis and technical indicators</b> such as RSI (Relative Strength Index) and MACD (Moving Average Convergence Divergence) to evaluate stocks.<br>iii) They establish trades by setting <b>stop-loss orders</b> to minimize losses and target prices to secure profits, based on key price levels of support and resistance.<br>iv) Traders buy stocks <b>at support (low prices) and sell</b> at resistance (high prices), capitalizing on the expected price swings between these levels. |
| <b>Advantages</b>                   | <b>i) Flexibility:</b> Swing trading allows traders to <b>adapt their strategies and positions</b> based on market fluctuations.<br><b>ii) Time Efficiency:</b> It is generally <b>less time-consuming</b> than day trading, as it doesn't require constant market monitoring.<br><b>iii) Profit Potential:</b> It offers opportunities to <b>capture profits from short- to medium-term price movements</b> in the market.  |
| <b>Disadvantages</b>                | <b>i) Market Knowledge Requirement:</b> It requires a thorough understanding of market dynamics and technical analysis, which can be complex.<br><b>ii) Missed Long-Term Gains:</b> Swing traders may miss out on the larger profits that can come from holding positions over a longer term, as they typically capitalize on shorter market movements.  |

## Drip pricing

### Why in the News?

Consumers often faces drip pricing while purchasing any commodities or services. Considering this, the Department of Consumer Affairs asked consumers to reach out to the ministry if they observe 'drip pricing'.

### About Drip Pricing

**1. About Drip pricing:** It is a **marketing strategy** where initially only a portion of a products or service's total cost is shown. The **full price is disclosed progressively** as the customer moves through the purchase process.

**2. Strategy used:** This strategy often involves concealing essential fees like taxes or booking fees, or excluding necessary add-ons such as internet access or amenities that are essential for the use of the product or service.



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The **price advertised in print, emails, or on websites, known as the “headline price,”** may not accurately represent the total cost that the consumer will ultimately pay.

**3. Why companies indulge in Drip Pricing-** Businesses use drip pricing **to attract customers** by starting with a lower price, and hoping that they will continue with the purchase even after seeing additional costs later.

**4. Impact on Consumer Behaviour:** Drip pricing can make it difficult for consumers **to compare prices** effectively.

**5. Sellers offering transparent prices at disadvantage-** Drip pricing may put **sellers who offer more transparent pricing** at a disadvantage.

### Nifty Non-Cyclical Consumer Index Fund

#### Why in the News?

Groww Mutual Fund has recently introduced India's First Nifty Non-Cyclical Consumer Index Fund.

#### About Nifty Non-Cyclical Consumer Index Fund

| Aspects             | Description  |
|---------------------|--|
| About               | 1) It is a <b>mutual fund</b> designed to <b>foster long-term capital growth</b> through investments in the securities of the <b>Nifty Non-Cyclical Consumer Index (TRI)</b> .<br>2) It is <b>India's first index fund</b> which enables people to invest in the top stocks from consumer industries such as FMCG, Textiles, etc.              |
| Launched by         | Groww Mutual Fund  |
| Aim of the fund     | The aim of the fund is to <b>achieve long-term capital growth</b> by investing in the securities of the Nifty Non-Cyclical Consumer Index (TRI) in their respective proportions and weightings.  |
| Purpose of the fund | This index <b>comprises 30 companies</b> that <b>exhibit resilience to economic fluctuations</b> and maintain steady demand.   |
| Characteristics     | 1) Non-cyclical stocks are also known as <b>defensive stocks</b> .<br>2) It tends to <b>perform well in the stock market</b> even during economic instability.<br>3) These <b>stocks maintain constant demand</b> and are not influenced by cyclical fluctuations because they provide everyday essentials such as food, water, and utilities. |

### India Volatility Index (VIX)

#### Why in the News?

Recent, surge in the India VIX reflects the anticipated near-term volatility in the market.

### About Volatility Index (VIX)

- 1. About Volatility Index (VIX):** The Volatility Index, commonly known as VIX or the **Fear Index**, measures how much volatility market players expect in the near future.
- 2. Role of Volatility in Finance:** Volatility refers to the **rate and extent of price changes** in the market, which is often associated with financial risk.
- 3. Behavior of the VIX:** During periods when the market is highly volatile, the VIX tends to increase. Conversely, when market volatility decreases, the VIX tends to fall.
- 4. Calculation of the VIX:** The VIX is calculated based on the **expected annualized volatility**, expressed in percentage terms, derived from the order book of options on a specific underlying index.

### About India VIX

- 1. About India VIX:** The India VIX is an index that shows **the expected level of volatility in the stock market over the next 30 days**. Higher numbers mean more expected volatility.
- 2. How It Works:** It uses the **prices of options on the NIFTY Index** to calculate expected future volatility. This is expressed as a percentage.
- 3. Why Is India VIX Important?**
  - i) Indicator of Fear:** It is sometimes called the **"Fear Index"** because it indicates how worried traders are about the market.
  - ii) Decision-Making:** Investors look at the VIX to take decisions regarding investments. When the VIX is high, the market is considered riskier.

## RBI Self-Regulatory Organization Framework for FinTech Firms

### Why in News?

Recently, The Reserve Bank of India (RBI) has introduced a new framework for the recognition of a Self-Regulatory Organization (SRO) for fintech Firms.

About RBI Self-Regulatory Organization Framework for FinTech Firms

- The Reserve Bank of India (RBI) has introduced a **new framework** for the recognition of a **Self-Regulatory Organization (SRO)** tailored specifically for the **FinTech sector**.
- Aim:** This initiative is aimed at **enhancing self-governance and compliance among FinTech companies**.
- 3. Organizational Requirements:**
  - Applicants for the SRO-FT **must be established as not-for-profit entities**.
  - Their shareholding structure should be **diversified, with no single entity holding 10% or more** of the paid-up share capital.
- 4. Operational Guidelines**
  - It is expected to operate with **objectivity, credibility, and responsibility**, under the oversight of the RBI.

b) It is **tasked with promoting the healthy and sustainable development** of the FinTech sector. This may include outlining **a phased approach to regulatory and supervisory compliance** where necessary.

## UPSC Syllabus: Science and technology

### Thrombocytopenia Syndrome (TTS)

#### Why in the News?

Recently, concerns were raised over the rare side effects of the AstraZeneca-Oxford COVID vaccine. AstraZeneca has admitted that its vaccine can cause Thrombocytopenia Syndrome (TTS) in rare case.

#### About Thrombocytopenia Syndrome (TTS)

**1. About Thrombocytopenia Syndrome (TTS):** It is a **rare condition** in which there is simultaneous **occurrence of blood clots (thrombosis) and a low platelet count (thrombocytopenia)**. It is also known as '**vaccine-induced immune thrombotic thrombocytopenia**' (VITT).

**Note:** **Thrombosis** is the **formation of a blood clot**, which can reduce normal blood flow in an affected blood vessel.

**2. Symptoms:** Various symptoms are linked to TTS, such as **shortness of breath, chest or limb pain, tiny red spots or bruising on the skin beyond the injection site, headaches, and numbness in certain body regions**. TTS may result in restricted blood flow due to clot formation.

#### 3. Diagnosis and treatment:

**Diagnosis-** Diagnosis of TTS involves a combination of blood tests and imaging studies, such as CT scans.

**Treatment-** Treatment for TTS is typically comprised of the following-

- a. **Anticoagulant medications** to prevent further clotting.
- b. **Intravenous immunoglobulin (IVIG)** which involves infusing a blood product containing antibodies
- c. **High-dose prednisone**, which is a form of steroid medication.

#### How are TTS and blood clots linked to the AstraZeneca vaccine?

1. TTS was a rare syndrome reported in people who received a Covid-19 **adenovirus vector-based vaccine**. The incidence of TTS has been **marginally higher among individuals under 60 years of age**.
2. TTS can be seen in various body regions, **including the brain, the abdomen, the lungs, limb veins and arteries**.
3. The process that causes TTS is not fully understood, but it is believed to be similar to **heparin-induced thrombocytopenia (HIT)** which is also a rare reaction to a medicine called heparin that affects how platelets works.

## Salmonella contamination in spices

### Why in the news?

In last six months, U.S has rejected 31 per cent of all spice-related shipments from Mahashian Di Hatti (MDH) due to salmonella contamination concerns. Recently, Hong Kong and Singapore have also suspended the sales of certain MDH and Everest Food Products.

### Why such spices are being rejected?

- 1. Reasons for rejection-** MDH export shipment have been rejected due to salmonella contamination. FDA inspection of MDH's manufacturing plant has also found inadequate sanitary facilities and accommodations, as well as contamination of equipment and utensils.
- 2. FDA Guidelines on Refused Shipments-** As per the guidelines by the FDA, if a shipment is refused entry, the importer can either destroy it or export it out of the US.

### About salmonella:

- 1. About Salmonella:** It is a type of bacteria that can cause gastrointestinal illness and fever, known as salmonellosis.
- 2. Nature of the bacteria:** Salmonella is a resilient and widespread bacteria. It is capable of surviving for weeks in dry environments and months in water.
3. It naturally resides in the intestines of animals and can be present in their faeces.
- 4. How humans get impacted:** Humans get infected when they come into contact with salmonella-infected animals or contaminated items.
- 5. Risks Associated with Salmonella:**
  - a) Salmonella infection can lead to symptoms such as diarrhea, fever, and stomach cramps.
  - b) Certain groups, including children under 5 years old, adults over 65 years old, and individuals with weakened immune systems, are vulnerable to Salmonella infection.

## Phishing Attacks in India

### Why in the News?

A report from Verizon Business has emphasized the rising incidence of phishing in India. Cybercriminals are resorting to new and sophisticated methods to deceive unsuspecting users into opening malicious emails or clicking on harmful links.

As a result, there is an increased risk of users experiencing financial losses and the compromise of their personal data.

### Highlights of the study:

- a) The report highlighted that there has been improvement in reporting practices of such incidents of phishing in India. However only 20% of users now identify and report phishing during simulation tests.
- b) Another Report of the company reveals that espionage attacks dominate the cyber security landscape in the Asia-Pacific region, including India.

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c) In the **Asia-Pacific region**, 25% of cyberattacks stem from espionage, a stark contrast to the 6% and % in Europe and North America, respectively. **The Asia-Pacific region saw a 180% growth in vulnerability exploitation.**

d) **System intrusion, social engineering, and basic web application attacks** represent 95% of breaches in Asian Pacific region.

e) The study also found that the most common types of data compromised are **credentials (69%), internal (37%), and secrets (24%).**

### About Phishing

Source: Cloudfare

**1. About Phishing:** It refers to an attempt to **steal sensitive information** in the form of usernames, passwords, credit card numbers, bank account information or other important data to utilize or sell the stolen information.

### 2. How Phishing is done:

a) In a phishing attack, the **sender pretends to someone trustworthy to the recipient**, such as a family member, the CEO of their company, or a well-known figure offering giveaways.

b) The **message prompts immediate action**, often with a sense of urgency and directing the recipient to a fake website resembling a legitimate one.

c) They are asked to input their login credentials which are then stolen by the attacker for identity theft, financial fraud, or selling personal information. **The phishing email's destination URL closely resembles the legitimate one.**

## Supersonic Missile-Assisted Release of Torpedo (SMART) system

### Why in the news?

The Defence Research and Development Organisation (DRDO) recently tested a Supersonic Missile-Assisted Release of Torpedo (SMART) system. This signifies a leap forward in India's defense technology. It has been tested from a ground-based mobile launcher positioned at the **launching complex 4 of Abdul Kalam Island.**

### About Supersonic Missile-Assisted Release of Torpedo (SMART) system

Source: PIB

**1. About:** SMART is a **next-generation missile-based light-weight torpedo delivery system.**

**2. Developed by:** It has been designed and developed by the **DRDO.**

**3. Aim:** It aims to **enhance the anti-submarine warfare capability of the Indian Navy.**

**4. Features:** It has several features which distinguish it with conventional range of lightweight torpedo.

a) It can be **launched from both coasts and warship.**

b) It is **canister-based missile system** which consists of several advanced sub-systems, namely **two-stage solid propulsion system, electromechanical actuator system, precision inertial navigation system etc.**

**Note:** The **system is canister-based** means that it is housed within a sealed container that can be easily transported and launched.



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c) The system carries advanced light-weight torpedo as payload along with parachute-based release system.

d) It also consists of several state-of-the-art mechanisms such as symmetric separation, ejection and velocity control.

**5. Significance:** The SMART would enhance the Navy's strength and will revolutionize underwater warfare capabilities of India. It also serves as testament of India's advancements in indigenous defence research and development.

### Eta Aquariids meteor showers

#### Why in the News?

Eta Aquariids meteor showers are active from April 16 and will peak on May 5 and 6. These meteor showers are seen in May every year and are best visible in countries such as Indonesia and Australia in the Southern Hemisphere.

#### About Eta Aquariids meteor showers

|                               |   |
|-------------------------------|---|
| <b>About</b>                  | The Eta Aquariid meteor shower is an annual celestial event that occurs when Earth passes through the orbital plane of Halley's Comet.  |
| <b>Origin</b>                 | 1. It is named after the Aquarius constellation, where its radiant point is located. Radiant points are the positions in the sky from which meteor showers appear to originate.<br>2. Eta Aquariids are associated with Halley's Comet, which orbits the Sun approximately once every 76 years.<br>(The last time Halley's Comet was visible from Earth was in 1986, and Halley's comet is due to enter the inner solar system again in 2061) |
| <b>Unique Characteristics</b> | <b>1. Rapid Speed and Glowing Tails-</b> The Eta Aquariid meteor shower is known for its rapid speed, resulting in long-lasting, glowing tails that can persist for several minutes.<br><b>2. Observational Rates:</b> Observers in the Southern Hemisphere typically witness 30 to 40 meteors per hour during the peak, whereas viewers in the Northern Hemisphere observe a lower rate of around 10 meteors per hour.                       |

#### Why number of Aquariid meteors decreases in Northern hemisphere?

The number of Aquariid meteors decreases in the Northern Hemisphere due to their radiant point's position in the sky. In the hemisphere, the radiant point appears to be skimming the earth. Hence termed as Earth gazers.

However, in the Southern Hemisphere, the radiant points are higher in the sky and more visible. Hence the meteors are more visible.

#### About comets and Meteors

**Comets-** Comets consist of dust, rock, and ice. They travel around the Sun in highly elliptical orbits, with some taking hundreds of thousands of years to complete one orbit. Currently, 3,910 comets are known,

but many more are believed to exist **beyond Neptune in regions like the Kuiper Belt and the distant Oort cloud.**

**Meteors-** Meteors are **celestial objects**, including rocks and debris, that ignite and vaporize upon entering Earth's atmosphere, resulting in a luminous streak across the sky. Meteors are often referred to as **shooting stars or falling stars**. However, they are not stars.

**Relation between Meteor showers and Comets-** Comets play a significant role in meteor showers **by shedding dust and debris** along their orbits around the Sun. As comets approach the Sun, they heat up and release gases and dust, forming a glowing head that can be larger than a planet.

## Development of Goldene

### Why in the News?

For the first time, scientists have successfully developed a free-standing, single-atom-thick sheet of gold. This marks the first instance of a metal being transformed into a 2D sheet. This breakthrough paves the way for numerous exciting opportunities in the future.

### About goldene

Source: Indian Express

| Aspect             | Description  |
|--------------------|--|
| About Goldene      | Goldene is a <b>2-dimensional allotrope of gold</b> , which means it consists of a single layer of gold atoms arranged in a two-dimensional structure.   |
| Unique features    | i) It <b>exhibits semiconductor properties when fabricated into this single-atom-thick layer</b> . Typically, gold is known for its excellent conductivity, but it behaves differently in its goldene form.<br>ii) These sheets of goldene are roughly <b>100 nanometres thick</b> (a nanometre is a billionth of a metre), approximately 400 times thinner than the thinnest commercially available gold leaf.                                    |
| How is it created? | i) Goldene has been created by first placing a <b>single layer of silicon between titanium carbide layers</b> .<br>ii) Then gold is added which diffused into the structure and replaced the silicon, forming a <b>monolayer of gold</b> .<br>iii) This was done with the help of an age-old Japanese technique using chemical popularly known as <b>Murakami's reagent</b> . This chemical is also used to forge katanas and high-quality knives. |

|                               |   |
|-------------------------------|---|
| <b>Potential applications</b> | <p><b>i) Electronics Industry Revolution:</b> Goldene <b>ultra-thin and lightweight properties</b> could significantly reduce the amount of gold needed in electronics.</p> <p><b>ii) Catalysis:</b> As a catalyst, goldene offers economic benefits over traditional three-dimensional gold due to its efficiency and <b>reduced material usage</b>. This could be useful in various <b>chemical processes</b>.</p> <p><b>iii) Extension to Other Metals:</b> The technique developed to create goldene could also be adapted to <b>produce two-dimensional sheets of other precious metals</b> like iridium and platinum, expanding the range of applications.</p> <p><b>iv) Special Properties for Advanced Applications:</b> Goldene has a unique structure where each atom connects to six others, not twelve. This could lead to specific uses in turning carbon dioxide into other materials, producing hydrogen, and purifying water.</p> |
|-------------------------------|---|

### MQ-9B Predator drones

#### Why in the News?

The Defence Ministry recently approved the procurement of **30 MQ-9B Predator drones (SeaGuardian variant) from the US** to enhance the surveillance capabilities of the armed forces.

#### About MQ-9B Predator drones

Source: Moneycontrol

| Aspects             | Description   |
|---------------------|---|
| <b>What is it?</b>  | <ol style="list-style-type: none"> <li>1) It is an <b>unmanned aerial vehicle (UAV)</b> that can perform flight operations either under remote control or autonomously.</li> <li>2) It is a <b>version of the MQ-9 "Reaper"</b>.</li> <li>3) It is the <b>first hunter-killer unmanned aerial vehicle (UAV)</b> built for prolonged surveillance at high altitudes.</li> </ol>  |
| <b>Developed by</b> | It is developed by <b>General Atomics Aeronautical Systems (GA-ASI)</b> .   |
| <b>Features</b>     | <ol style="list-style-type: none"> <li>1) The MQ-9B features <b>integrated signals and communications intelligence systems</b>. It consists of various custom sensors can be fitted to it as needed.</li> <li>2) It has <b>two versions</b>: the <b>SkyGuardian</b> and the <b>SeaGuardian</b>.</li> <li>3) It is capable of remaining airborne for around 35 hours.</li> <li>4) It is <b>equipped with precision strike missiles</b>. The MQ-9B has enhances capabilities in land and maritime surveillance, anti-submarine and anti-surface warfare, electronic warfare, and various expeditionary missions.</li> <li>4) It <b>facilitates automatic take-offs and landings, integrates into civil airspace</b>, and <b>enhances real-time situational awareness</b> in maritime environments for both military and civil authorities.</li> </ol> |

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|                     |  |
|---------------------|--|
|                     | 5) It has carrying capacity of up to 5,670 kg and a fuel capacity of 2,721 kg. This boosts the operational capability of these drones.   |
| <b>Significance</b> | 1) Unmanned armed vehicles play a crucial role at borders by <b>providing real-time reconnaissance</b> , target acquisition, and tracking of people and illegal activities through high-quality video feeds.<br>2) They also <b>enhance security and operational efficiency</b> by supporting the armed forces in transporting essential supplies. |

### Magnetic resonance imaging

#### Why in the News?

The **Magnetic Resonance Imaging (MRI) market** is projected to hit \$9.8 billion by 2028. This technology plays a pivotal role in medical science, offering diverse applications throughout the human body.

#### About Magnetic resonance imaging (MRI)

**1. About MRI:** It is a **non-invasive medical imaging technique** that provides detailed images of internal structure in the human body, including **organs, Bones, Muscles. Blood vessels and Joints.**

#### 2. How Does MRI Work?

MRI leverages the magnetic properties of **hydrogen atoms**, which are **abundant in the body's fat and water content.** The procedure involves four main components:

a. **Superconducting Magnet** that generates a strong magnetic field around the targeted body part.

b. Radio frequency **Pulses** which excite hydrogen atoms, raising their energy level.

c. **Larmor Frequency** is the specific frequency at which hydrogen atoms resonate and absorb radio waves, varying by magnetic field strength and tissue type.

d. After the pulse, hydrogen atoms emit energy as they revert to their normal state, which is **captured by a detector and converted into images by a computer.**

#### 3. Significance of MRI:

1) It is used to obtain images of **soft tissues within the body.** It is widely used to image the brain, the cardiovascular system, the spinal cord and joints, various muscles, the liver, arteries, etc.

2) MRI is particularly **crucial for diagnosing and monitoring various cancers**, such as prostate and rectal cancer, and is also essential for tracking neurological conditions including Alzheimer's disease, dementia, epilepsy, and stroke.

3) Functional MRI is **used to track changes in blood flow in the brain** which helps to understand how neuronal activity shifts.

#### Pros of MRI

**1. Versatile Imaging:** Due to its construction and the arrangement of magnets, an **MRI can image the body virtually from all useful directions** and in very fine increments as needed.

**2. Safety:** MRI uses magnetic fields and radio waves instead of ionizing radiation, **making it safer for patients** compared to other imaging modalities like X-rays and CT scans.

**3. No Residual Effects:** MRI scans are non-invasive, which means that the magnetic fields used do not

have lasting effects on the atoms in the body once the scan is complete.

**4. Minimal Health Risks:** Generally, MRI scans are associated with no long-term health risks, except for pregnant women.

#### **Challenges associated with MRI**

**1. Cost:** MRI machines are expensive, leading to high expenses for patients, particularly those without insurance or needing multiple scans.

**2. Discomfort and Noise:** Patients **endure discomfort and noise** while remaining still inside the MRI bore, especially challenging for claustrophobic individuals.

**3. Safety Concerns:** Strong magnetic fields in MRIs pose risks for individuals with metallic implants or embedded objects, potentially excluding them from undergoing scans

## **Neural Processing Unit**

### **Why in the news?**

Recently, Apple launched the M4 chip with the iPad Pro. Its key feature includes a 16-core Neural Engine which is equivalent to an NPU.

### **About Neural Processing Unit**

**1. About NPU:** A Neural Processing Unit is a **specialized processor designed to accelerate neural network processes**. These neural networks are fundamental to machine learning algorithms for data processing. They are part of the semiconductors specifically designed for machine learning operations, which enables AI features such as generating text or images.

### **2. Applications:**

i) NPUs excel in AI-related tasks like **speech recognition, natural language processing, and image or video editing processes** such as object detection.

ii) They enable **efficient handling of complex AI operations**, enhancing performance in consumer gadgets like smartphones, laptops, and tablets.

iii) **NPUs play a crucial role in efficiently** deploying AI-powered applications directly on hardware.

### **Differences Between NPU, CPU, and GPU**

**About CPU (Central Processing Unit):** It processes instructions one at a time and ideal for tasks requiring sequential data processing. It is **best for general computing, applications, and systems operations**.

**About GPU (Graphics Processing Unit):** It is capable of multiple calculations simultaneously, optimized for graphics and complex computations. It focuses on **graphic rendering and resolution upscaling** and are also used in AI development stages.

**About NPU (Neural Processing Unit):** It is similar to GPUs but **exclusively optimized for neural network and AI computations**. It is more efficient and is less power-consuming for AI tasks, and running refined AI models on devices.



## RSM-56 Bulava Missile

### Why in the News?

Russian President Vladimir Putin has strengthened Russia's military capabilities by directing the inclusion of a new nuclear-capable missile, the Bulava, into the Russian military's arsenal.

### About the RSM-56 Bulava Missile



Figure 2. Source: mwstats.info

**1. About:** The RSM-56 Bulava is a Russian submarine-launched intercontinental ballistic missile (ICBM). It is also known to NATO as SS-N-32.

**2. Design and Development:** It was designed by the Moscow Institute of Thermal Technology and its

development started in the late 1990s. The missile is intended for deployment on Russia's Borei-class submarines.

### 3. Key Features:

**a) Structure:** The Bulava is a three-stage missile that uses solid propellant.

**b) Specifications:** It has a launch mass of approximately 36.8 tonnes and a throw weight of 1,150 kg. The missile measures 12.1 meters in length within its launch container and has a diameter of 2 meters.

**c) Range and Payload:** Bulava can travel up to 8,300 km (5,160 miles) and carries up to 10 multiple independently targetable re-entry vehicles (MIRVs) which are designed to deliver nuclear warheads to various targets.

**d) Capabilities:** The missile's re-entry vehicles (RVs) are capable of in-flight maneuverability and re-targeting, allowing them to potentially evade enemy defenses.

**e) Accuracy:** The RVs have an expected accuracy of about 250 to 300 meters.

**4. Strategic Importance:** Bulava represents a crucial element of Russia's future strategic nuclear force enhancing the country's nuclear deterrent capabilities.

### PS4 engine

#### Why in the News?

ISRO successfully tested the PS4 engine of the PSLV stage for an extended duration.

#### About PS4 engine



Source: MINT

**1. About:** The PS4 engine is a vital component of the Polar Satellite Launch Vehicle (PSLV), utilized by the Indian Space Research Organisation (ISRO) for satellite launches.

**2. Purpose and Functionality:** It serves as the uppermost stage of the PSLV. It comprises of two Earth-storable liquid engines. These engines are crucial for propelling the rocket's upper stage during its mission.

**3. Propellant Combination:** It employs a bipropellant combination, utilizing nitrogen tetroxide as the oxidizer and monomethyl hydrazine as the fuel. This combination ensures efficient and reliable performance.

**4. Thrust and Operation:** Each PS4 engine is capable of producing a thrust of 7.3 kiloNewtons (kN) in vacuum conditions. It facilitates propulsion and manoeuvring of the upper stage.

**5. Transition to 3D Printing:** Traditionally manufactured using machining and welding methods, the PS4 engine has now shifted to 3D printing. This transition allows for intricate designs and optimal material utilization.

**6. Utilization in Reaction Control System (RCS):** It also serves in the Reaction Control System (RCS) of the initial stage (PS1) of the PSLV rocket. The RCS ensures precise control during ascent, trajectory adjustments, payload deployment, and docking manoeuvres.

## Sea Anemone

### Why in the News?

Researchers at the ICAR-National Bureau of Fish Genetic Resources (NBFGR) who were studying sea anemones in the Lakshadweep archipelago have observed widespread bleaching of anemones near Agatti Island.

### About Sea Anemones

**1. About Sea anemones:** They are soft-bodied, invertebrate aquatic animals known for their ability to sting.

**2. Taxonomic Classification:** It belongs to the phylum Cnidaria. Sea anemones are ocean-dwelling creatures with unique adaptations for survival in marine environments.

**3. Habitat:** They typically reside in oceans and are closely associated with corals and live rocks.

**3. Characteristics:** It has the following characteristics features:

i) Sea anemones display a range of colours and can have numerous tentacles. It varies from a dozen to a few hundred.

ii) Their vibrant hues and graceful tentacles adorn tide pools and reefs.

iii) These organisms possess a sticky foot or disc that enables them to anchor themselves to rocks on the sea bottom or coral reefs, ensuring stability in their habitat.

iv) It is equipped with stinging cells containing organelles called nematocysts. Sea anemones can deliver potent stings to prey or threats. These nematocysts contain small threads that are ejected when triggered mechanically or chemically.

**4. Symbiotic Relationships:** Sea anemones often form symbiotic associations with various animals, with the most famous partnership being with clownfish.

i) The clownfish seeks refuge within the anemone's tentacles, protected from predators, while providing leftover meals to the anemone.

ii) Certain species of sea anemones also engage in symbiosis with Hermit crabs.

iii) The anemone attaches itself to the crab's shell, benefiting from transportation and access to food, while the crab gains protection from predators through the anemone's presence.

## Auroras

### Why in the News?

A powerful solar storm recently caused a dazzling array of colors to light up the skies in several locations worldwide.

### About Auroras



Source: The Indian Express

**1. About Auroras:** They are natural phenomena characterized by **bright, swirling curtains of light that illuminate the night sky.**

- i) These dazzling displays manifest in **various colours**, including blue, red, yellow, green, and orange.
- ii) It is termed **aurora borealis in the north** and **aurora Australis in the south**. They primarily occur near the poles but can occasionally **extend to lower latitudes**.

**2. Causes of Auroras:** Auroras stem from solar activity, particularly from the surface of the Sun.

- i) The Sun emits a continuous stream of charged particles, predominantly electrons and protons, known as the **solar wind**.
- ii) As this **solar wind interacts with the Earth's magnetic field**, it creates a protective shield.



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iii) However, **some charged particles become trapped in the Earth's magnetic field** and travel along magnetic field lines to the poles.

iv) Upon reaching the upper atmosphere, these **particles collide with gases, resulting in luminous flashes that illuminate the sky**. Oxygen collisions produce green light, while nitrogen collisions generate shades of blue and purple.

**3. Expansion to Midlatitudes:** Auroras extend to midlatitudes during periods of intense solar activity.

i) **Solar flares and coronal mass ejections (CMEs)** increase solar wind intensity, leading to geomagnetic storms.

ii) These storms are characterized by temporary disturbances in the Earth's magnetic field. It allows **auroras to be visible in mid-latitudes**.

**4. Recent Events and Impact:** A recent geomagnetic storm triggered by a CME led to widespread auroral displays.

i) It is classified as **"extreme"** by the National Oceanic and Atmospheric Administration (NOAA).

ii) This storm may **affect various space-dependent operations**, including GPS, radio communications, flight operations, power grids, and space exploration programs.

## Zero-Day Vulnerabilities (ZDVs)

### Why in the News?

Another zero-day vulnerability has struck Google Chrome, prompting concern among users and cybersecurity professionals alike.

### About Zero-Day Vulnerabilities (ZDVs)

**1. About Zero-Day Vulnerability (ZDV):** It denotes a **system or software flaw that remains unknown to its vendor**, lacking any available patch or mitigation at its discovery.

**2. About Zero-Day Attack:** Zero-Day Attack refers to the **immediate exploitation of a ZDV, with no time-lapse** between the vulnerability's discovery and the commencement of the attack. **A Zero-Day Attack** transpires when threat actors swiftly develop and deploy malware specifically designed to target the ZDV.

**3. About Zero-Day Exploit:** Zero-Day Exploit refers to the method employed by hackers to capitalize on a ZDV, often through the deployment of malware, facilitating the execution of the attack.

### Risks Associated with Zero-Day Vulnerabilities

**1. Heightened Risk Factors:** ZDVs pose a substantially **elevated risk to users due to their discovery preceding awareness** among security researchers and software developers.



**2. Cybercriminal Exploitation:** Cybercriminals actively exploit ZDVs to **exploit vulnerabilities and profit from their malicious activities**, creating urgency to address the issue.

**3. Extended Exposure:** Systems vulnerable to ZDVs remain exposed until the respective vendor releases a patch to address the identified flaw, leaving users susceptible to potential attacks.

## Xenotransplantation

### Why in the News?

Recently, the first person to receive a transplant of a genetically modified pig kidney through Xenotransplantation passed away approximately two months after the procedure.

### About Xenotransplantation

**1. About Xenotransplantation:** It involves using **live animal cells, tissues, or organs** to treat human medical conditions.

**2. History and Need for Xenotransplantation:** The first attempts to use animal hearts in human transplants happened in the 1980s. There was a **big shortage of human organs** which were needed for transplant. This led doctors to look at animal organs as an alternative.

### 3. Xenotransplantation Process:

1. Animal organs, like pig kidneys, are **genetically altered** to prevent the human body from rejecting them. This involves removing certain animal genes and adding human ones to make the organ more compatible.

2. After the transplant, **continuous monitoring** is required to see how the body reacts to the new organ.

### 4. Risks and Complications:

**1. Infection Risks:** There is a **risk of transmitting infections from the animal to the human recipient**. This can affect not only the individual but potentially spread to others.

**2. Long-term Health Risks:** There is also a **concern about retroviruses**. These are viruses that could remain dormant and cause diseases years after the transplant.

### Why are pigs commonly used in xenotransplantation

**1. Similar Body Structure as Humans:** Pigs are often chosen because their **body structure and functions are similar to humans**. Pigs are easy and cost-effective to breed.

**2. Enhanced possibility of Organ Size Matching:** **Different pig breeds offer a variety of organ sizes**. This makes it easier to find a match for human recipients.

## GPT-4 Omni

### Why in the News?

Recently, OpenAI launched GPT-4o. This is CHAT GPT's newest and most advanced large language model yet. This model is designed to enhance the performance and user-friendliness of ChatGPT, making it the fastest and most powerful AI from OpenAI to date.

### About GPT-4o

**1. About GPT-4o:** GPT-4o, or GPT-4 Omni, is an **advanced AI model** developed by OpenAI. It is designed to interact with users through **text, images, and audio**. This is a **multimodal model**, which means it can understand and generate content in different formats.

### 2. Key Features of GPT-4o

- i) Multimodal Interaction:** It can **process and respond to text, images, and audio inputs** all in one place.
- ii) Improved User Interaction:** It **acts like a digital personal assistant**, handling tasks like real-time translations and spoken conversations.
- iii) Enhanced AI Capabilities:** It has the **ability to interpret emotions**, background noises, and visual cues from images and videos.
- iv) Availability:** The text and image functionalities are already available, with audio and video capabilities to be released gradually to ensure safety and quality.
- iv) Fast Response Time:** It **responds to queries** almost as quickly as a human, within about 232 to 320 milliseconds.
- v) Multilingual Support:** It is better at understanding and responding in **multiple languages**.

### 3. Why GPT-4o Matters

- i) Competition in AI Technology:** It positions OpenAI and its partner Microsoft to compete more strongly in the AI market against companies like Google and Meta.
- ii) Integration into Services:** It can be integrated into existing services and devices, improving their functionality with AI features.

### 4. Limitations and Safety Concerns

- i) Early Development Stage:** Some features, especially in audio, are still in early development and are available in a limited capacity.
- ii) Safety Measures:** It includes filtered training data and refined behaviours to address potential risks like cybersecurity threats, misinformation, and bias.
- iii) Continuous Improvement:** OpenAI is actively working to enhance the model's safety and capabilities.

## Armoured Sailfin Catfish

### Why in the News?

Scientists at the **CSIR-Centre for Cellular and Molecular Biology (CCMB)** have discovered that the armoured **sailfin catfish** now occupies 60% of the water bodies in the Eastern Ghats, causing damage to fishing nets and the ecosystem.

### About the Armoured Sailfin Catfish (*Pterygoplichthys*)



Figure 3. Source: Fishacademia

#### 1. General Characteristics:

It is known as **Rakashi or devil fish**. It belongs to the **genus Pterygoplichthys**. It exhibits a remarkable ability to thrive on a varied diet

and survive in low-oxygen environments. It is capable of navigating on land using its powerful fins.

**2. Reason for Introduction:** This species was initially introduced due to its **unique appearance and utility** in cleaning algal growth in tanks and aquariums.

**3. Invasive Status:** It is classified as an **invasive species**, with a rapidly expanding population confirmed by advanced genetic testing methods such as 'eDNA-based quantitative PCR assay'.

#### 4. Impact on the Environment:

**a) Threat to Biodiversity:** It is known for consuming large quantities of native fish, thus threatening the balance of aquatic ecosystems.

**b) Physical Characteristics and Threats:** It lacks commercial value and is equipped with sharp spines and a robust body, which have damaged fishing nets and caused injuries to fishermen.

#### Significance in the Ornamental Fish Trade:

**a) Regulation by National Biodiversity Authority (NBA):** Listed as one of the 14 invasive species by the NBA, specifically highlighting its prominence in the ornamental fish industry.

**b) Predominance in Invasive Listings:** Four out of the six species introduced for ornamental purposes and listed as invasive belong to the *Pterygoplichthys* genus, marking it as a particularly problematic invasive group.



## Nancy Grace Roman telescope

### Why in the News?

NASA's forthcoming Nancy Grace Roman Space Telescope is set to embark on a pioneering mission to search for primordial black holes that originated billions of years ago, close to the time of the Big Bang.

### About Nancy Grace Roman telescope



Source: WION

**1. About the Nancy Grace Roman Space Telescope:** It is formerly the **Wide Field InfraRed Survey Telescope (WFIRST)**. It is a **NASA observatory** designed to settle essential questions in the **areas of dark energy, exoplanets and infrared astrophysics**. The telescope will provide one of the most in-depth views into the **center of our Milky Way galaxy**.

**3. Objectives of the Mission:** It will continuously observe hundreds of millions of stars **to detect subtle changes in brightness** that indicate the presence of planets, distant stars, icy objects on the fringes of our solar system, and isolated black holes.

#### 4. Telescope Instruments:

**i) Wide Field Instrument (WFI):** WFI will allow scientists **to explore the cosmos** all the way from the outskirts of our solar system to the edge of the observable universe.

**ii) Expansive Field of View:** It possesses a field of view 100 times larger than Hubble's infrared instrument, allowing for broader sky coverage in less time.

**iv) Galactic Survey:** It aimed at measuring light from a billion galaxies throughout the mission.

v) **Exoplanet Search:** It will conduct a microlensing survey of the inner Milky Way to discover approximately 2,600 exoplanets.

vi) **Coronagraph Instrument:**

a) **Advanced Imaging:** It serves as a technology demonstrator for high-contrast imaging and spectroscopy of nearby exoplanets.

b) **Focused Galactic Survey:** The Galactic Bulge Time-Domain Survey will use infrared vision to penetrate dust clouds obscuring the dense central region of the Milky Way.

**5. Observational Strategy:**

a) **Frequent Imaging:** It will take images every 15 minutes continuously around the clock for about two months.

b) **Extended Mission Timeline:** This imaging cycle will be repeated six times throughout the five-year primary mission, amounting to over a year of total observation time.

## Igla-S VSHORAD

**Why in the News?**

The Indian Army will receive more Russian Igla-S very short range air defense systems (VSHORAD). This will address a long-standing gap in its air defense capabilities that has experienced several delays.

**About Acquisition of Igla-S VSHORAD**



Figure 4, Source: The hindu

**1. Acquisition of Igla-S VSHORAD:** The Indian Army will receive a new batch of Russian Igla-S very short-range air defence systems (VSHORAD) by the end of May or early June. This initiative is aimed at filling a critical gap in India's air defence capabilities.

**2. System Components:** The Igla-S system includes the 9M342 missile, the 9P522 launching mechanism, the 9V866-2 mobile test station, and the 9F719-2 test set. Together, these components provide a robust defence against low-flying aircraft, cruise missiles, and drones.

**3. Capabilities:**

i) It is a hand-held defence system that can be operated by an individual or crew.



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ii) It is designed to bring down low-flying aircraft and can also identify and neutralise air targets such as cruise missiles and drones.

**3. Deployment and Strategic Importance:** The systems are specifically intended for **new air defence units** in the high mountainous terrain along India's northern border. One regiment has already been equipped with these systems.

**4. Future Developments and Indigenous Efforts:** Post deployment of Iгла-S, the Army plans to transition to advanced laser-beam riding and infrared VSHORADS.

The Defence Research and Development Organisation (DRDO) has already conducted successful flight tests of indigenous VSHORADS missiles, marking progress toward self-reliance in air defence technology.

### NASA's PREFIRE Polar Mission

#### Why in News?

NASA will soon launch 2 satellites under PREFIRE polar mission. PREFIRE stands for Polar Radiant Energy in the Far-InfraRed Experiment.

#### Objectives of the PREFIRE Polar Mission:

- 1) The mission will be aimed at filling the knowledge gap about two of the most remote regions on Earth — the Arctic and Antarctic.
- 2) It will measure the **amount of far-infrared radiation(heat) emitted** from two of the coldest, most remote regions on the planet, into space.
- 3) It will find out how **atmospheric water vapor and clouds** influence the amount that escapes to space.

#### About the Mission

PREFIRE is composed of **two small CubeSats** outfitted with specialized miniature heat sensors.

They will be launched with the **help of Electron launch vehicle**, which is equipped with the technology proven on Mars.

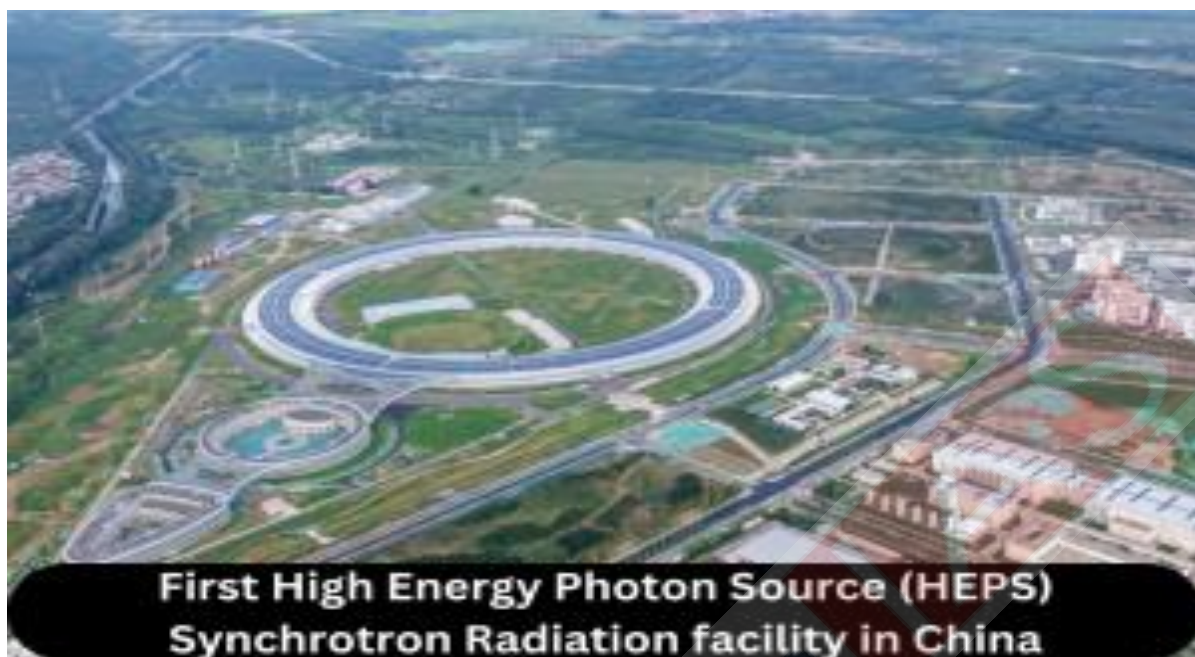
#### Significance of the PREFIRE Polar Mission

At the tropics, Earth absorbs a lot of energy from the Sun. This **energy is travelled to polar regions** with the help of wind movement and water currents. Then this heat is transferred to into the space.

About **60 percent of the heat energy, going outwards** into space from earth in the form of far-infrared wavelengths, **has never been measured**.

The knowledge from the **mission will improve computer models** that are used **to predict** how Earth's ice, seas, and weather will change in a warming world.

## First High Energy Photon Source (HEPS) Synchrotron Radiation facility in China



### Why in News?

China is about to complete its High Energy Photon Source (HEPS) facility in Huairou Science City in Beijing. After completion, it will be the brightest Synchrotron Radiation (SR) source and first fourth-generation synchrotron facilities in the world. **High Energy Photon Synchrotron Radiation**

### About High Energy Photon Source (HEPS)

The HEPS is a next-generation synchrotron that generates a specific type of synchrotron light source.

HEPS operates by **accelerating electrons to nearly the speed of light and making them travel in a circular path**. As these high-speed electrons change direction under the influence of magnetic fields, they emit Synchrotron Radiation, which includes X-rays. These X-rays are then harnessed for various scientific applications.

### Salient Features of HEPS

- 1) It can accelerate electrons up to energies of 6 gigaelectron volts, within its storage ring, with 1.36 Km of circumference.
- 2) HEPS generates X-rays that are ten times brighter than those produced by existing synchrotron facilities, allowing for unprecedented clarity in imaging and analysis.
- 3) It offers extremely precise imaging capabilities, enabling scientists to observe and manipulate materials at the atomic and molecular levels.
- 4) It will reduce the time taken by experiments, from milliseconds to hundreds of nanoseconds.

### Applications of HEPS

## Factly Compilation for the Month of May 2024

- **Material Science:** HEPS enables the detailed study of materials' structure and properties, which is crucial for developing new materials with enhanced performance.
- **Biology:** The facility allows for the examination of biological molecules and complex protein structures, aiding in understanding diseases and developing new treatments.
- **Nanotechnology:** HEPS will support the development of nanotechnology by providing insights into the behavior of nanomaterials and their applications.

### What is a Synchrotron?

A synchrotron is a large circular machine, the size of a football field. It is a type of particle accelerator that produces high-energy X-rays and other forms of electromagnetic radiation. It accelerates electrons to near-light speeds and guide them in a circular path, causing them to emit synchrotron radiation.

Prominent synchrotron facilities include the European Synchrotron Radiation Facility (ESRF) and the Advanced Photon Source (APS) in the USA.

## Critical Priority Pathogens

### Why in the news?

The latest Bacterial Pathogens Priority List (BPPL) updated by the World Health Organization (WHO) notes that critical priority pathogens pose major global threats because of their high burden and their ability to resist treatment and spread resistance to other bacteria.

### About Critical Priority Pathogens

**1. About Critical Priority Pathogens:** They are bacteria that pose significant global health threats because they can resist current treatments and spread their resistance to other bacteria.

**2. World Health Organization's Updated List:** The WHO has updated its Bacterial Pathogens Priority List (BPPL). It includes 15 families of antibiotic-resistant bacteria.

These are categorized into critical, high, and medium priority groups to help prioritize responses.

**3. High Burden in Specific Regions:** The list highlights that certain high-priority pathogens like Salmonella and Shigella carry a particularly high burden in low- and middle-income countries. These pathogens pose major challenges in healthcare settings.

**4. Resistance to Antibiotics:** These pathogens include gram-negative bacteria that are resistant to last-resort antibiotics and Mycobacterium tuberculosis that is resistant to Rifampicin which is a key antibiotic.

**5. Antimicrobial Resistance (AMR):** AMR occurs when bacteria, viruses, fungi, and parasites no longer respond to medicines. This makes infections harder to treat and increasing the risk of disease spread, severe illness, and death. The misuse and overuse of antimicrobials are significant drivers of AMR.

**6. Challenges associated with Critical Priority Pathogens:** Pathogens like antibiotic-resistant *Neisseria gonorrhoeae* and *Enterococcus faecium* are known for **causing persistent infections** and **showing resistance to multiple antibiotics**. This necessitates targeted research and public health interventions.

#### About WHO Bacterial Priority Pathogens List

1. The 2024 WHO Bacterial Priority Pathogens List (WHO BPPL) serves as an essential resource in the worldwide battle against antimicrobial resistance.
2. This version updates the 2017 edition and enhances the ranking of antibiotic-resistant bacterial pathogens to meet the changing threats posed by antibiotic resistance.

### AK-203 Assault Rifles

#### Why in News?

Recently, the Indian Army received AK-203 assault rifles from Russia.

#### About the AK-203 Assault Rifles



Source: The Hindu

1. **About AK-203 Rifles:** It is an **advanced version of the AK-47 rifle**, designed for improved ergonomics and accuracy. It is developed by the **Russian company Kalashnikov Concern**.
2. **Manufactured by:** The rifles are being **manufactured in India** as part of a joint venture named Indo-Russian Rifles Private Ltd. (IRRPL).
3. As of now, **27,000 AK-203 rifles have been delivered** to the Indian Army. An additional 8,000 rifles are expected to be handed over in the next two weeks.
5. **Indigenisation Efforts:** The **current level of indigenisation** in the production of AK-203 rifles is **approximately 25%**. The **aim** is to increase this to **70% within the next two years**.



#### 6. Strategic Importance:

- i) The induction of AK-203 rifles is part of the Indian Army's broader initiative to modernize its infantry weapons and replace the older INSAS rifles.
- ii) These rifles are considered crucial for enhancing the combat readiness of the Army, particularly for troops involved in counter-insurgency operations.
- iii) The AK-203 rifles represent a significant upgrade in the Indian Army's arsenal, combining local manufacturing with critical technology transfer, thereby boosting both defense capabilities and domestic defense production.

**7. Other Rifle Acquisitions:** Concurrently, the Indian Army has also inducted 66,400 SIG-716 assault rifles for frontline troops, highlighting ongoing efforts to bolster its small arms capabilities.

### Project Astra

#### Why in News?

Recently, Google showcased an early version of Project Astra at its annual developer conference.

#### About Project Astra



Figure 5. Source: The Indian Express

1. It is Google's initiative to develop AI that understands and responds using text, voice, and visual inputs. It is designed for devices like smartphones and smart glasses.

2. **User Interaction:** Thi

s technology enables users to interact with their environment by capturing information through their device's camera. It is similar to asking a question about something they see or hear.

**3. Goals:** The main aim is to facilitate real-time information exchange and interaction through wearable technology.

**4. Functionality:**



i) **Accessing Information:** The Google AI Assistant within Project Astra can retrieve and provide information from both the internet and real-world scenes captured by the device's camera.

ii) **Learning and Adaptation:** The AI is designed to learn from interactions and the user's environment, enhancing its effectiveness as a personal assistant.

## 5. Comparison with OpenAI's GPT-4o

**1. Modalities and Platforms:** Project Astra employs a **multimodal approach** (text, voice, and visuals) and is **versatile across various platforms**, including smart glasses. In contrast, **GPT-4o primarily focuses on voice interactions and is mainly used on smartphones.**

**2. Impact and Advancement:** Project Astra is considered a significant step forward, **potentially changing how users interact with AI across multiple devices.** Meanwhile, GPT-4o marks progress in voice and text-based AI capabilities, but it primarily enhances smartphone applications.

## Pig Butchering Scam

### Why in the News?

Pig Butchering Scams **are on the rise globally including in India.** It is a type of online financial fraud.

### About Pig Butchering Scam



Figure 6. Source: dotsecurity.com

**1. About Pig Butchering Scam:** It is also known as a **"sha zhu pan" scam.** It is a type of **online investment fraud.**

The term "pig butchering" comes from the scammers' practice of "fattening up" their victims by building trust over time before "slaughtering" them and stealing their money.

### 2. Execution Method:

a) Scammers, or "hosts," initiate contact through social media, dating apps, or misleading messages. The host establishes a fake relationship or friendship with the target, referred to as the "pig."

b) The scammer introduces the **concept of cryptocurrency trading to pique interest.** Victims are directed to a fraudulent trading app, where they are misled to believe they are making profitable trades.

c) As trust builds, **the scammer persuades the victim to increase their investment, effectively “fattening” them for the scam.** When victims attempt to withdraw funds, they face excuses or high fees from the fake platform, revealing the scam’s true nature.

**3. Challenges in Fund Recovery:** Due to the **irreversible nature of blockchain transactions**, recovering lost funds is often extremely challenging.

## Psychedelics

### Why in the News?

Researchers are advocating **for domestic clinical trials of psychedelic drugs**, motivated by the increase in global trials and the low effectiveness of existing medications in treating mental health issues.

### About Psychedelics

**1. About Psychedelics:** Psychedelics are drugs that **alter perception, behavior, consciousness, and thought**, often intensifying sensory awareness.

2. This category of drugs is a **subset of psychotropic substances** known for their ability to drastically change an individual’s thoughts, perceptions, and can cause vivid hallucinations.

### 3. Categories of Psychedelics:

**a) Classical Psychedelics:** These compounds primarily cause **hallucinations** by activating the serotonin 5-HT receptor, which is prevalent throughout the human body, including in the gastrointestinal tract, platelets, and the nervous system.

Examples include LSD (lysergic acid diethylamide), psilocybin, and DMT (N, N-Dimethyltryptamine).

**b) Non-Classical Psychedelics:** These substances interact with a variety of receptors. Notable examples are ketamine and MDMA (3,4-methylenedioxy-N-methamphetamine).

### 4. How it works:

Most psychedelics **enhance the presence of serotonin**, a hormone that stabilizes mood, by binding to serotonin receptors. These receptors are molecules located on cell surfaces that trigger specific biochemical reactions when they bind with certain chemicals.

**5. Research and Clinical Use:** Currently, five psychedelics are being extensively studied in clinical research focused on treating mental health issues: **psilocybin, LSD, MDMA, ketamine, and DMT.**

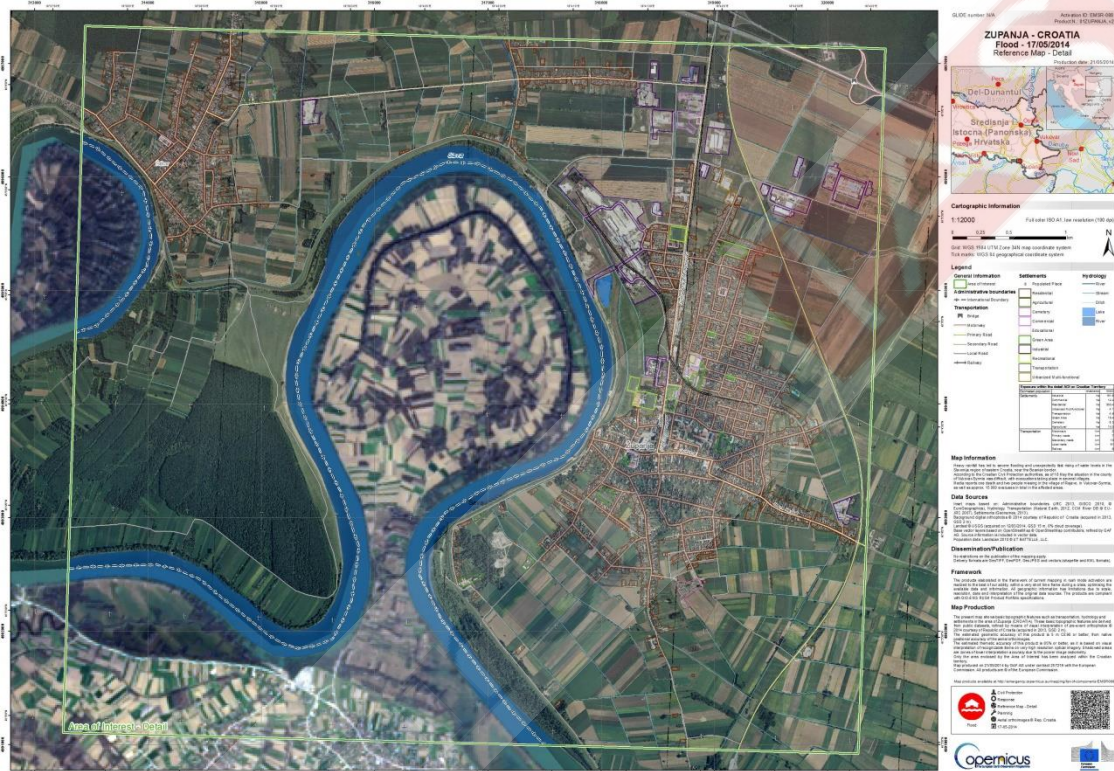
**6. Regulation:** The **1971 United Nations’ Convention on Psychotropic Substances** regulates approximately 200 **psychotropic substances divided into four schedules**, with Schedule I listing those with the highest potential for abuse. The convention does not specify the count, or the types of substances classified as psychedelics.

## Copernicus Emergency Management Service (EMS) Programme

### Why in News?

Following a helicopter crash in East Azerbaijan province carrying Iranian President Ebrahim Raisi, the European Union **activated its Copernicus EMS rapid response mapping service** in response to a request from Iran, as part of a collaborative effort.

### About Copernicus Emergency Management Service (EMS) Programme



Source: [emergency.copernicus.eu](https://emergency.copernicus.eu)

**1. About Copernicus Emergency Management Service (EMS) Programme:** It was originally launched as the Global Monitoring for Environment and Security Programme (GMES) in **1998**.

2. The program employs a **comprehensive suite of data sources**, including satellites, and terrestrial, airborne, and maritime measurement systems, to offer environmental information useful to researchers, policymakers, public authorities, international organizations, and both commercial and private users.

3. This information **supports a range of applications**, such as climate change response, disaster management, and agriculture.

4. The space component of the program comprises a constellation of satellites known as **the Sentinels and the Contributing Missions**.

This is supplemented by a **ground component**, which consists of in-situ sensors that facilitate access to data from the Sentinels and Contributing Missions.

**2. Components of the Service:** It has two component that are **mapping component** and **Early Warning Component**:

**i. Mapping component** provides **maps and analysis based on satellite imagery**.

**a) Rapid Mapping (RM):** It **offers timely maps and analyses** within hours or days for immediate response needs.

**b) Risk and Recovery Mapping (RRM):** It **produces detailed maps for long-term disaster management**, focusing on prevention, preparedness, disaster risk reduction, and recovery, usually within weeks or months.

**ii. Early Warning Component:** It **issues alerts and provides near-real-time assessments of environmental threats** such as floods, droughts, and forest fires.

**3. How does rapid mapping work?**

i) This service involves the **acquisition, processing, and analysis of satellite imagery, geospatial data**, and pertinent social media content in a rapid manner.

ii) It offers **four types of "products"**: one pre-event reference and three post-event products (first estimate, delineation, and grading). It includes:

**a) Reference Product** which gives **quick information on the area of interest** and assets before the emergency/disaster takes place.

**b) First Estimate Product** provides a **quick assessment of the most affected locations** after the disaster has taken place.

**c) Delineation Product** **supplies information on the impact, extent, and update on the situation** after the disaster has taken place.

**d) Grading Product** which **provides damage assessment, spatial distribution, and extent** after the disaster has taken place.

iii) Each product **includes a set of deliverables consisting of maps** and a vector package of spatial data.

## Space tourism

**Why in News?**

India-born aviator and commercial pilot Gopi Thotakura became the first space tourist from India. He is flying on the Blue Origin NS-25 mission.

**About Space tourism**





Source: Indian Express

1. Space tourism is **human space travel for recreational or leisure purposes**. It is divided into different types which includes **orbital, suborbital, and lunar space tourism**.
2. Space tourism is also as a **commercial activity** related to space. It includes going to space as a tourist, watching a rocket launch, going stargazing, or travelling to a space-focused destination.

### About Sub-Orbital Trips

1. Sub-Orbital Trips involves flights that **cross the Karman line (about 100 km above Earth)**, the boundary between Earth's atmosphere and outer space, without entering orbit around Earth. **Most space tourism flights are sub-orbital trips**.
2. The spacecraft crosses the Karman line stays briefly in space, and then descends back to Earth.

**Note:** Anything flying below the **Karman line** is classified as an **aircraft** and above it is a **spacecraft**.

### Scope of longer Space Journeys

1. **Orbit and ISS Stays:** Space tourists can orbit Earth and spend days on the International Space Station (ISS) at an **altitude of about 400 km**. Dennis Tito, in 2001, spent over seven days on the ISS.
2. **Future Prospects:** Space tourism can be extended to deeper space trips to the Moon, other planets, or asteroids.

## AI Agents

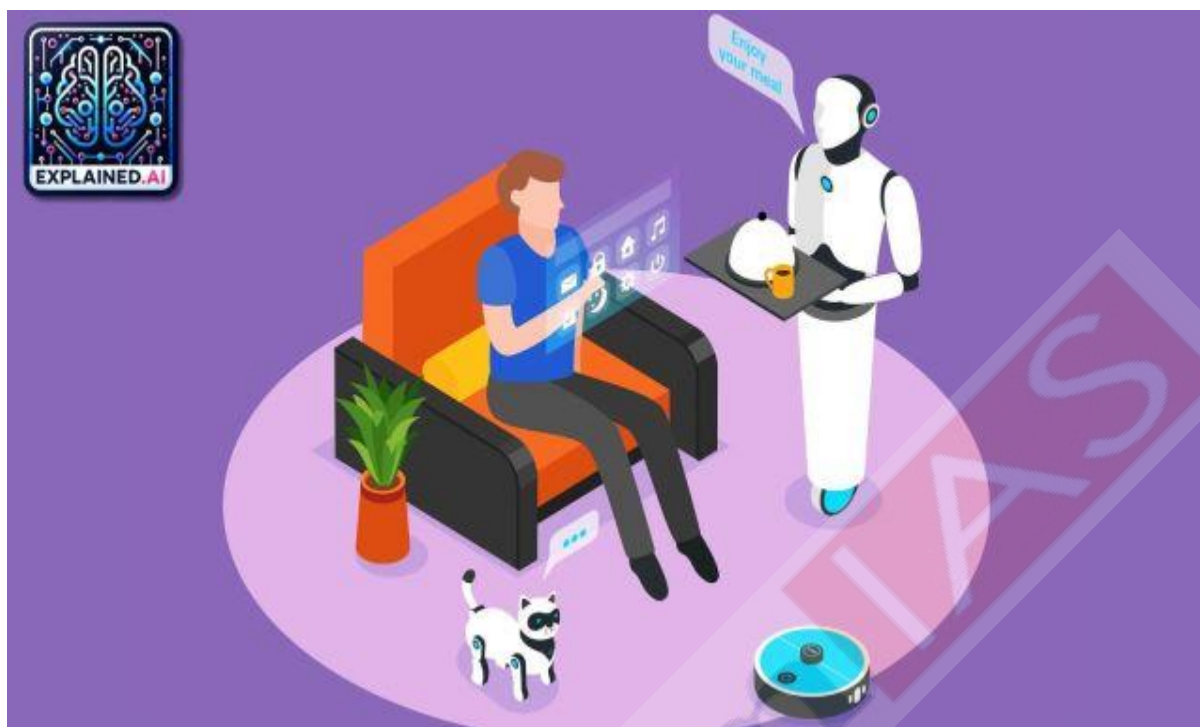
### Why in News?

GPT-4o and Project Astra are also termed as 'AI agents'. These surpass traditional voice assistants like Alexa and Siri. This signals a shift from simple chatbots to advanced, multimodal AI agents.

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## About AI Agents



Source: Indian express

**1. Definition:** AI agents are **advanced AI systems** that interact in real-time with humans using multiple modes of communication such as text, voice, and images.

Unlike traditional language models that operate solely on text, **AI agents can also process voice and visual inputs.**

**2. Functionality:** They perceive their environment via **sensors**, **process this information with AI algorithms**, and take actions based on this data. This allows them to adapt to new situations and handle a variety of scenarios.

### Differences from Large Language Models (LLMs)

**1. Enhanced Interaction:** They provide **more natural and immersive interactions** by integrating voice, vision, and environmental sensing, unlike LLMs which are restricted to generating text.

**2. Contextual Awareness:** They **understand and respond based on the context of interactions**, which makes them capable of offering personalized and relevant responses. They have autonomy to perform complex tasks such as coding and data analysis.

### Potential Uses of AI Agents

**1. Versatile Assistants:** They **can manage tasks ranging from giving personalized recommendations** to scheduling appointments, ideally suited for customer service.

**2. Educational Tools:** They can **act as personal tutors**, adapting to different learning styles and offering customized instructions.

## Factly Compilation for the Month of May 2024

**3. Healthcare Support:** They **can assist medical professionals** by providing diagnostic support and real-time patient monitoring.

### Risks and Challenges

**1. Privacy and Security:** As they can access and use a lot of personal and environmental data, there is a significant concern about **how this information is protected and used**.

**2. Bias:** They might also **replicate biases present in the data** or algorithms they were trained on. This **can result in unfair or harmful decisions**.

**3. Regulation Needs:** As AI agents become more widespread, there **needs to be strong rules and guidelines** to ensure they are used responsibly and safely.

## Types of online cybercrimes

### Why in News?

Numerous Indians are becoming victims of online financial fraud. The **Indian Cybercrime Coordination Centre (I4C) analyzed trends** from January to April, and discovered that 46% of reported frauds during this time came from Myanmar, Laos, and Cambodia.

### About types of online cybercrimes

Source: [blog.ccasociety.com](http://blog.ccasociety.com)

| Types                               | Description  |
|-------------------------------------|--|
| <b>Trading Scam</b>                 | <b>Method:</b> Scammers use social media to <b>advertise free trading tips</b> , falsely using well-known stock market experts to lure victims into exclusive groups.<br><b>Process:</b> Victims are manipulated into <b>downloading unregulated trading apps and making financial investments</b> . They later find out that they cannot withdraw their money until they reach a very high account balance. |
| <b>Digital Arrest</b>               | <b>Method:</b> Victims receive misleading calls <b>claiming their involvement with illegal packages</b> , with impersonators posing as law enforcement officials demanding money to resolve these fabricated issues.<br><b>Process:</b> In some cases, victims are kept in a <b>'digital arrest'</b> , needing to stay on a video call until they comply with the scammers' financial demands.               |
| <b>Investment Scam (Task-Based)</b> | <b>Method:</b> Individuals are promised <b>easy money for completing simple online tasks</b> aimed at boosting social media ratings.<br><b>Process:</b> After completing initial tasks, victims are <b>persuaded to invest more money for greater returns</b> , which never materialize, leading to continuous   |

|                            |   |
|----------------------------|---|
|                            | investment requests.  |
| <b>Romance/Dating Scam</b> | <p><b>Method:</b> Scammers create <b>fake online dating profiles</b> to establish romantic relationships, then concoct emergencies that supposedly require financial assistance.</p> <p><b>Process:</b> The scam typically escalates to a crisis where the <b>fictional partner</b> claims to be detained and in need of funds for release.</p> |

Read more: [Indian Cyber Crime Coordination Centre \(I4C\)](#)

## Zero Debris Charter

### Why in News?

Recently, twelve countries signed the **Zero Debris Charter at the ESA/EU Space Council**. This charter formalizes their commitment to the **long-term sustainability of human activities** in Earth's orbit.

### About Zero Debris Charter



Source: European Space Agency

|                               |  |
|-------------------------------|--|
| <b>Launch</b>                 | The Zero Debris Charter is an initiative launched by the <b>European Space Agency (ESA)</b> during the <b>ESA Space Summit in Seville in November 2023</b> .               |
| <b>Aim and Binding Status</b> | It <b>aims to create a community of space actors committed</b> to achieving specific debris mitigation and remediation targets by 2030. It is <b>non-legally binding</b> . |

## Factly Compilation for the Month of May 2024

|                                  |   |
|----------------------------------|---|
| <b>Goals and Objectives</b>      | <p>a) The Charter aims to <b>eliminate the creation of new space debris by 2030</b>.</p> <p>b) The charter stipulates that the probability of a mission generating space debris should be <b>less than 1 in 1,000 for each object involved</b>.</p> <p>c) The charter also sets a target of <b>99% success rate for post-mission disposal strategies</b>, including the use of external means if necessary.</p> |
| <b>Implementation Strategies</b> | <p>a) To achieve these goals, ESA will develop innovative technologies for satellite end-of-life disposal, in-orbit servicing, and active debris removal.</p> <p>b) The agency will also collaborate closely with regulatory bodies to ensure the effective implementation of these strategies.</p>   |

### Types of online cybercrimes

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Read more: [Indian Cyber Crime Coordination Centre \(I4C\)](#)



## INS Kiltan

### Why in News?

The Indian Naval Ship Kiltan received a warm reception from the Royal Brunei Navy upon its arrival in **Muara, Brunei**.

### About INS Kiltan



Source: Indian Express

| Aspects                     | Description  |
|-----------------------------|--|
| About                       | <ol style="list-style-type: none"><li>INS Kiltan is a <b>state-of-the-art indigenous warship</b> which is set to be commissioned into the Indian Navy.</li><li>It is the <b>third in the Kamorta-class corvettes</b> built under <b>Project 28</b>.</li><li>It is named after an island in the Aminidivi group which is part of the <b>strategically important Lakshadweep and Minicoy group of islands</b>.</li></ol> |
| Designed and constructed by | The Indian Navy's Directorate of Naval Design and constructed by <b>Garden Reach Shipbuilders &amp; Engineers (GRSE)</b> in Kolkata.   |

## Factly Compilation for the Month of May 2024

|                               |  |
|-------------------------------|--|
| <b>Features of INS Kiltan</b> | <p>1. INS Kiltan is the first major Indian warship with a superstructure made from <b>carbon fibre composite material</b>, enhancing stealth, reducing weight, and cutting <b>maintenance costs</b>.</p> <p>2. INS Kiltan is outfitted with a <b>variety of advanced and largely indigenous weapons and sensors</b>.</p> <p>a) This includes <b>heavyweight torpedoes and anti-submarine warfare (ASW) rockets</b>, which are essential for its role in submarine defense.</p> <p>b) The ship also features a <b>76 mm caliber medium-range gun and two multi-barrel 30 mm guns</b>, serving as <b>close-in-weapon systems (CIWS)</b> with dedicated fire control systems to protect against incoming threats.</p> <p>c) It is equipped with <b>missile decoy rockets (Chaff)</b> for evasion maneuvers.</p> <p>d) The ship incorporates an <b>advanced Electronic Support Measure (ESM) system</b>, as well as a <b>sophisticated bow-mounted sonar</b> and the <b>Revathi air surveillance radar</b>, enhancing its detection and tracking capabilities.</p> |
| <b>Future enhancement</b>     | It has been planned to install a <b>short-range Surface-to-Air Missile (SAM) system</b> and will be equipped with an <b>integral ASW helicopter</b> .  |
| <b>Strategic Importance</b>   | <p>a) It joins the lineage of indigenous warships like <b>the Shivalik Class and Kolkata Class</b>, along with <b>sister ships INS Kamorta and INS Kadmatt</b>.</p> <p>b) It will provide a <b>comprehensive operational picture</b> and bolster the Indian Navy's combat capabilities.</p>  |

## Magellan Mission

### Why in News?

Recent research has unveiled new signs of volcanic activity on Venus. This new signs of volcanic activity arise from analyses of data collected by NASA's Magellan mission, which orbited Venus from 1990 to 1994.

### About the Magellan Mission

1. **About the Mission-** The Magellan mission is an **initiative of NASA** launched on May 4, 1989, from Cape Canaveral using the space shuttle Atlantis. It is the **first interplanetary mission initiated from a Space Shuttle**. The mission is named after the Portuguese explorer Ferdinand Magellan, renowned for being the first to circumnavigate the Earth.

2. **Aim-** The main purpose of the Magellan mission was to **map Venus's surface**. Venus has a very thick atmosphere which obscures optical observation. This makes radar imaging a necessity for studying its surface.

3. **Mission Duration-** Magellan reached Venus in 1990. The mission provided new insights into Venus, **revealing a relatively young surface that might have been shaped by extensive lava flows** from widespread volcanic activity.

In **October 1994**, the **Magellan spacecraft was deliberately directed to crash into Venus** to collect valuable data on Venus's atmosphere during its final moments. This marks the first deliberate crash of an operational planetary spacecraft.

### Future mission on venus

1. **VERITAS Mission 2031:** NASA's upcoming mission, **VERITAS** (Venus Emissivity, Radio Science, InSAR, Topography, and Spectroscopy), is set for a 2031 launch.

2. **Aim:** This mission aims to enhance the **understanding of Venus's surface and interior through more precise observations**.

3. **Mission Goals:** VERITAS will explore why **Venus**, despite its similarities in size and composition to Earth, has followed a distinct evolutionary path.

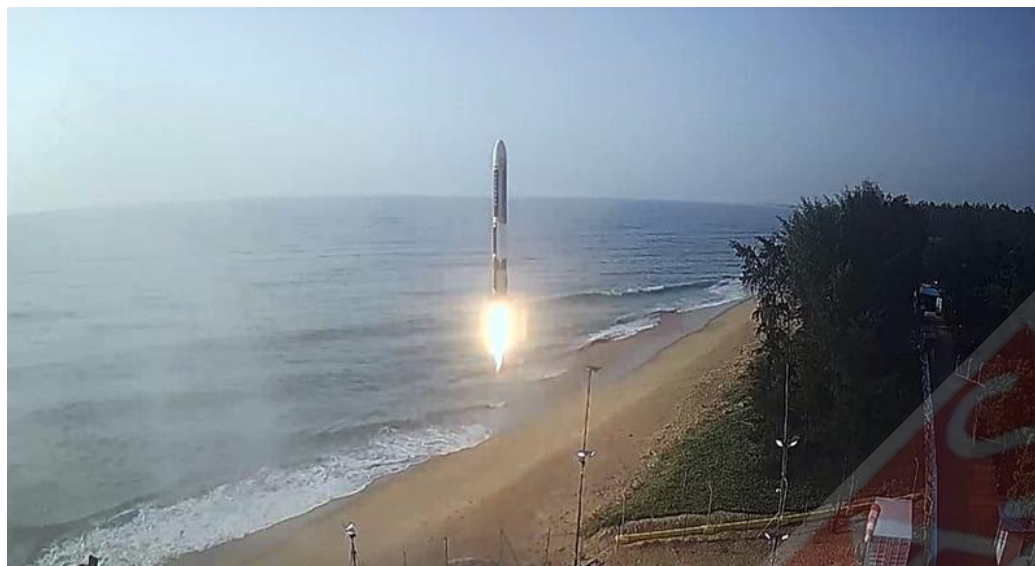
## Agnibaan SubOrbital Technological Demonstrator (SOrTeD)

### Why in News?

The Agnikul Cosmos Private Ltd. recently launched the Agnibaan Sub Orbital Technology Demonstrator (SOrTeD) from Sriharikota.

### About Agnibaan SubOrbital Technological Demonstrator (SOrTeD)

## Factly Compilation for the Month of May 2024



Source: The hindu

| Aspect                          | Description  |
|---------------------------------|--|
| About                           | Agnibaan SOrTeD is a <b>single-stage rocket</b> equipped with the Agnilet engine which is a proprietary technology of AgniKul.   |
| Uniqueness                      | The engine is fully <b>3D-printed, single-piece, and semi-cryogenic</b> , delivering 6 kilonewtons (kN) of thrust.   |
| Launch Mechanism                | Unlike conventional sounding rockets that use guide rails, Agnibaan SOrTeD launches <b>vertically</b> , following a <b>pre-programmed trajectory</b> to execute specific flight maneuvers.   |
| Specifications and Capabilities | <ol style="list-style-type: none"><li>1. The rocket can be configured as a <b>single or two-stage launcher</b>, depending on mission requirements.</li><li>2. It <b>stands 18 meters tall, weighs 14,000 kg, and is capable of carrying payloads up to 100 kg</b> to an altitude of 700 km in one of five different configurations.</li><li>3. The <b>first stage</b> can host up to seven Agnilet engines, fueled by <b>Liquid Oxygen and</b></li></ol> |

## Factly Compilation for the Month of May 2024

|  |   |
|--|---|
|  | <p><b>Kerosene.</b></p> <p>4. It is designed to be launched from <b>over 10 different launch ports</b> worldwide.</p> <p>5. AgniKul developed <b>a versatile launch pedestal named 'Dhanush'</b> to accommodate various launch sites and this enhances the rocket's mobility across its configurations.</p> |
|--|---|

## UPSC Syllabus: Schemes and programmes

### Project ISHAN

#### Why in the News?

With the idea of One nation, one airspace, India has initiated Project ISHAN (Indian Single Sky Harmonized Air Traffic Management) at Nagpur. This project aims to **enhance the capacity of the aviation industry to handle the increasing domestic passenger numbers**, which has been predicted to double by 2030.

#### About Project ISHAN

**1. About Project ISHAN:** It is an **integration initiative** which seek **to merge India's four Flight Information Regions (FIRs)** in Delhi, Mumbai, Kolkata, and Chennai into **one airspace around Nagpur**.

**Note:** In aviation, a flight information region (FIR) is a specified region of airspace in which a flight information service and an alerting service (ALRS) are provided.

**2. Aim:** The aim behind the initiative is **to reduce carbon footprint, enhance safety, and reduce aircraft fuel usage**.

**3. Advantages:** A single flight information region (FIR) created as part of Project ISHAN would offer numerous advantages in terms of **safety, efficiency, user satisfaction, reduced carbon footprint, and optimal manpower utilization**.

**4. Challenges in implementing the ISHAN Initiative:** There are several challenges in implementation such as **standardization of technology, revision of procedures, and formulation of new policies**.

For the better implementation of ISHAN initiative, there will be requirement of **Uniform technology implementation** across all regions, **comprehensive retraining** of air traffic control officers, **policy reforms and updates** to accommodate new processes and technologies.



## CBSE emphasizing on promoting mother tongue in learning

### Why in the News?

The Central Board of Secondary Education (CBSE) has issued a circular instructing schools to prioritize educational material focusing on learning in students' mother tongues. This initiative aligns with the **National Education Policy, 2020**, and the **National Curriculum Framework, 2022**, which advocate for teaching and learning in local languages.

### About the Initiative:

Source: The Hindu

- a) CBSE has urged schools to **utilize educational materials** emphasizing learning in students' mother tongues or regional languages.
- b) The initiative is **supported by the collaboration** between the **National Council for Educational Research and Training (NCERT)** and the **Indian Institute of Languages**.
- c) They have **developed 52 entry-level primers tailored** to various mother tongues and local languages spoken across India. These primers are available in languages such as Bhutia, Bodo, Garo, Khandeshi, Kinnauri, Kuki, Manipuri, Nepali, Sherpa, and Tulu. These serve as **basal readers for local languages** and **introduce numerals** to children attending balvatikas and anganwadis.
- d) Schools are **encouraged to promote the use of these primers** among teachers and students to foster strong language skills in their native languages. The aim is to **preserve linguistic diversity and promote multilingual education**, as highlighted in national educational documents.

## UPSC Syllabus: Governance, schemes and programmes

### National Savings Certificate (NSC)

### Why in News?

Prime Minister Narendra Modi disclosed his investments in the National Savings Certificate (NSC) scheme.

### About National Savings Certificate (NSC)



Source: [Sarkariyojna.com](http://Sarkariyojna.com)

**1. About:** The NSC is a **fixed-income investment scheme** introduced by the Government of India. It is designed to **encourage investment and tax savings**, especially for low- to mid-income investors.

**2. Investment Process:** NSCs can be **purchased at any post office**. They can be bought in an individual's name, for a minor, or jointly with another adult.

**3. Eligibility Criteria:** Only individual Indian citizens who are residents of India. There is no age restriction for purchasing NSC. Hindu Undivided Families (HUFs), trusts, and private and public limited companies cannot invest.

#### 4. Features of NSC

i) NSC is a **secure, government-backed investment**. It offers fixed returns and significant tax benefits, making it a popular choice among conservative investors who prefer low-risk investment options.

ii) **Interest Rates:** The certificates **earn a fixed annual interest**, revised quarterly by the government.

iii) **Maturity Period:** The investment matures after **five years**.

iv) **Investment Limit:** There is **no maximum limit** on the amount that can be invested.

v) **Tax Benefits:** Investments **qualify for tax savings** under Section 80C of the Income Tax Act, up to ₹1.5 lakhs annually.

vi) **Accessibility:** NSCs are **easily transferable between post offices and individuals** without affecting the interest or maturity.

vii) **Collateral:** They can be **used as collateral for loans in banks and non-banking financial companies (NBFCs)**. Investors can nominate a family member (including minors) to inherit the certificate in case of their demise.

viii) **Premature withdrawal:** It is **not allowed except under specific conditions** such as the death of the investor, court orders, or forfeiture by a pledgee who is a Gazetted Government Officer.

## Central Council for Research in Ayurvedic Sciences (CCRAS)

### Why in News?

The Central Council for Research in Ayurvedic Sciences (CCRAS) launched “PRAGATI- 2024”.

### About PRAGATI-2024



Figure 7. Source: PIB

1. PRAGATI-2024 stands for Pharma Research in AyurGyan And Techno Innovation.
2. It is designed to explore research opportunities and enhance collaboration between the Central Council for Research in Ayurvedic Sciences (CCRAS) and the Ayurveda

drug industry.

About Central Council for Research in Ayurvedic Sciences (CCRAS)

**1. About:** It is an **autonomous body** under the **Ministry of AYUSH, Government of India**.

**2. Headquarters:** The headquarters is located in **New Delhi, India**.

**3. Primary Role:** It serves as the **apex body in India** for conducting, **coordinating, formulating, developing, and promoting research** in Ayurvedic sciences on scientific lines.

**4. Research focus:** The Council's research activities encompass a **wide range of areas** including:

- a) Medicinal Plant Research involving Medico-Ethno Botanical Survey, Pharmacognosy, and Tissue Culture
- b) Drug Standardization
- c) Pharmacological Research
- d) Clinical Research
- e) Literary Research & Documentation
- f) Tribal Health Care Research Programme

5. It also focuses on the **formulation, coordination, development, and promotion of scientific research** in both Ayurveda and Sowa-Rigpa medicinal systems.

### Kutch Ajrakh

#### Why in the News?

Recently, The traditional artisans of 'Kutch Ajrakh', were bestowed the Geographical Indication (GI) certificate by the Controller General of Patents, Designs, and Trademarks (CGPDTM). This art form has originated from the culturally rich **Kutch region in Gujarat**.

This recognition serves as a testament to the exceptional artistry and cultural significance of the age-old craft practised by the artisans in the region.

#### About Kutch Ajrakh

| Specifications                             | Details  |
|--|--|
| <b>Origin of the Art Form</b>              | The name 'Ajrak' finds its roots in 'Azrak', which denotes Indigo. Indigo is widely used as a potent dye to produce a blue hue.  |
| <b>Key Details of the art Form</b>         | 1. The art form involves <b>hand-block printing of elaborate designs</b> on treated <b>cotton fabric</b> .<br>2. Natural vegetable and mineral colours are used in this printing.<br>3. Predominantly dominated by three colours-<br>a. <b>Blue</b> - Symbolizing the <b>sky</b><br>b. <b>Red</b> - Symbolizing <b>earth</b> and <b>fire</b><br>c. <b>White</b> - Symbolizing the <b>stars</b> |
| <b>Centres of practice of the art Form</b> | The art work is predominantly practised in the Sindh, Barmer, and Kutch regions of Gujarat. <b>Ajrakhpur</b> is the <b>epicenter of Ajrakh work</b> in Gujarat.  |
| <b>Prominent users</b>                     | Nomadic pastoralist and agricultural communities like the <b>Rabaris, Maldharis,</b> and <b>Ahir's</b> are the prominent users of the products derived from these artform. They wear Ajrakh printed cloth as <b>turbans, lungis, or stoles</b> .   |

#### What is the significance of the Kutch Ajrakh?

- 1. Historic significance-** This craft holds historical significance as it was introduced to Ajrakhpur region over **400 years** back by the **Sind Muslims**.
- 2. Socioeconomic significance-** Kutch Ajrakh provides a platform for artisans **to showcase their craftsmanship** on a global stage.
- 3. Promotion of Sustainability-** The award of GI tag to Kutch Ajrakh will **promote sustainable livelihoods** within the community of weavers belonging to this region.



## UPSC Syllabus: Art and culture

### UNESCO's Memory of the World Recognition for Indian Texts

#### Why in the News?

During the tenth session of the Memory of the World Committee for Asia and the Pacific (MOWCAP) in Ulaanbaatar, Mongolia, three Indian literary works—Ramcharitmanas, Panchatantra, and Sahrdayaloka-Locana were included in UNESCO's Memory of the World Asia-Pacific Regional Register.

#### About UNESCO's Memory of the World Recognition for Indian Texts



Source: The Indian express

1. Three significant Indian literary works were added to UNESCO's Memory of the World Asia-Pacific Regional Register: **Ramcharitmanas, Panchatantra and Sahrdayaloka-Locana.**

2. **Significance of the Recognized Works:** These works were chosen for their **global appeal and profound influence** on both Indian and international audiences.

#### 3. Specific Works and Attributes:

i) **Ramcharitmanas:** The Ramayana and Ramcharitmanas are widely read in Southeast Asian countries like **Cambodia, Thailand, Sri Lanka, and Indonesia.** **Two versions of the Ramcharitmanas** were submitted to UNESCO, one by **Goswami Tulsidas** and another translated into Arabic in the **18th century**, demonstrating the text's broad appeal in West Asia and beyond.

ii) **Panchatantra:** It was selected for **its universal moral lessons.**



iii) **Sahrdayaloka-Locana:** It is recognized for its aesthetic significance, authored by renowned Kashmiri scholars **Acharya Anandvardhan and Abhinavagupta**.

### About the Memory of the World (MOW) Program

1. The UNESCO Memory of the World (MOW) program is a **global initiative** aimed at **preserving, protecting, and enhancing access to documentary heritage**, particularly those collections that are rare and at risk.

2. **Program Launch:** It was **initiated in 1992**. The program's goal is **to prevent "collective amnesia"** by safeguarding invaluable archives and library collections worldwide and promoting their widespread dissemination.

### 3. Program Significance:

i) **Recognition and Registration:** The program identifies documentary heritage of international, regional, and national importance maintains registers for these collections, and assigns a distinct logo to recognized collections.

ii) **Access and Preservation:** It ensures equitable access and preservation of documents.

iii) **Awareness and Advocacy:** The program actively campaigns to inform governments, the public, and the private sector about the need to preserve documentary heritage and encourages fundraising efforts for this cause.

iv) **Inscription Benefits:** Registering documents confirms their significance, enhances their visibility, and improves access, supporting research, education, entertainment, and ongoing preservation.

## Recent study on Pyramid Construction Techniques

### Why in the news?

A recent study on **Pyramid Construction Techniques** provides insights into how ancient Egyptians transported massive stone blocks needed for pyramid construction.

### Findings of the study

Source: Indian Express

1. The study highlights the critical **role of the River Nile** in facilitating the construction of Egypt's pyramids.

Researchers have **identified an extinct branch of the Nile** that ran adjacent to the pyramid sites, which was instrumental in moving heavy materials.

## Factly Compilation for the Month of May 2024

- 2. Discovery of the Nile Branch:** The research team used radar **satellite imagery, historical maps, geophysical surveys, and sediment coring** to map the ancient river branch, now buried by sandstorms and a major drought.
3. The study suggests that this branch of the Nile likely **served as a waterway** for transporting not just stone blocks but also equipment and personnel, significantly easing the construction process.
4. The study showed that **several causeways leading from the pyramids** connected to inlets of this Nile branch, which may have functioned as riverine harbours.
5. The ancient Egyptians likely used **large ramps, possibly greased with water or wet clay, along with sledges, sturdy ropes, and levers** to move the stones from the harbours to the pyramid sites.
6. This discovery supports the theory that the logistical capabilities of the ancient Egyptians, including the **use of the river's natural flow**, reduced the human labor needed and optimized the construction process of the pyramids.
7. The study also revealed about the **advanced mathematical and architectural knowledge of the Egyptians**, as evidenced by the precise 52-degree gradient on each side and alignments in pyramid construction.
8. The archaeological findings of well-organized living quarters, bakeries, and food remnants near the pyramids indicate that the **laborers were well-provided for**, and that the entire construction effort was **managed by a centralized authority**.

## UPSC syllabus: History

### Stone age and related study

#### Why in News?

New research suggests that the Stone Age, a longprehistoric period known for human and ancestral use of stone tools, could be just as aptly called the '**Wood Age**'.

#### About the new research and its findings

## Factly Compilation for the Month of May 2024



Source: Indian Express

1. New research from Schöningen, Germany, where wooden tools dated between 300,000 and 400,000 years old were found, suggests **these weren't just simple sticks but complex tools requiring skill and time to create.**
2. The study reveals a **variety of woodworking techniques** such as splitting, scraping, and abrasion, indicating a sophisticated understanding of wood manipulation.
3. **Thomsen's Chronology:** Christian Jürgensen Thomsen, a 19th-century Danish archaeologist, **categorized human prehistory** into the Stone Age, Bronze Age, and Iron Age. This chronology, though refined, largely shapes our understanding of human technological progress.
4. The study also reveals that despite the abundance of wood as a resource, archaeological evidence of its use is scarce compared to stone, bone, and clay due to preservation issues.
5. **Importance of Schöningen Findings:** The site in Schöningen provided well-preserved wooden tools due to its damp, oxygen-poor soil conditions.

This discovery challenges the notion that early humans primarily used stone, highlighting a potentially greater role for wood.

### Schöningen's Insights into Early Human Behavior

## Factly Compilation for the Month of May 2024

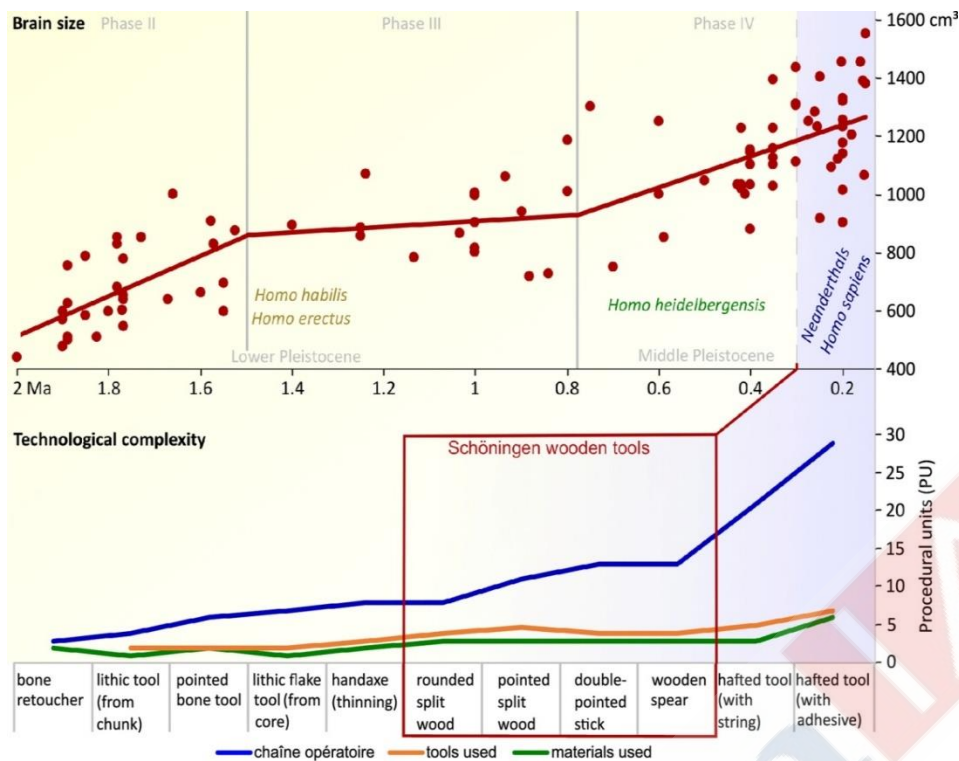


Figure 8. Source: Indian express

**1. Discovery of Spears:** In the mid-1990s, archaeologist Hartmut Thieme discovered wooden spears alongside stone tools and remains of wild horses, suggesting early humans were not mere scavengers but skilled hunters.

## 2. Complex Tool

**Use:** Further analysis of these

tools using advanced technology like 3-D microscopy and micro-CT scanners revealed sophisticated techniques such as wood splitting, previously thought unique to modern humans.

## About stone age

1. The Stone Age is a prehistoric period that spanned from about 3.4 million years ago to 12,000 years ago.
2. This era accounts for 99% of human history and is noted for the initial use of stones for tools, weapons, and fire-making by early humans.
3. This period marks the evolution from nomadic hunter-gatherers to settled agricultural societies, including the domestication of animals and the innovation of tool usage.

## Divisions of the Stone Age

**1. Palaeolithic Period (Old Stone Age):** From the first use of stone tools up to the end of the last Ice Age, approximately 2.5 million to 10,000 years ago.

It is characterized by a nomadic existence with groups living in caves or forests. Technological and Cultural Development Included the creation of simple stone tools and cave paintings.

**2. Mesolithic Period (Middle Stone Age):** This follows the Palaeolithic, lasting from the end of the last Ice Age to the onset of agriculture. A warmer climate which supported early farming developments and the domestication of animals.

This featured more sophisticated stone tools, including the prepared-core technique, allowing the production of similarly shaped tools from the same stone.

**3. Neolithic Period (New Stone Age):** It begins with the start of farming and lasts until the introduction of metal tools, marking the beginning of the Bronze Age. Transition from nomadic to sedentary lifestyles, forming villages and towns has been seen.

This age witnessed animal domestication, the advent of agriculture, and the creation of pottery and textiles.

## UPSC Syllabus: Species in news

### Red Colobus Monkey

#### Why in the News?

With the increasing biodiversity crisis, Conservationists have suggested Conservation of red colobus monkey species. Their conservation could have cascading net positive impacts on African tropical forest health.

#### About red colobus monkey

Source: Sean Crane Photography

| Aspect               | Details   |
|----------------------|---|
| About                | The world monkey family consists of two major groups- <b>Colobines</b> and <b>Cercopithecline</b> . <b>Colobines</b> - Are primarily leaf-eaters. <b>Red Colobus monkey belongs to this group</b> . This Group also includes langurs from South and Southeast Asia. <b>Cercopithecline</b> - These are omnivores and include animals in their diet. It includes macaques of south and southeast Asia and the mangabeys, mandrills, drills and baboons of Africa.  |
| Habitat and Location | <b>Location</b> - They are primitive monkey species native to western, central, and eastern Africa. They are found from <b>Senegal in the west</b> to the <b>Zanzibar Archipelago in the east</b> .<br><b>Habitat</b> - Their habitats include humid forests, coastal thickets, and scrub.  |
| Vulnerability Status | They have been listed as one of the <b>world's 25 most endangered primates by the IUCN</b> .  |
| Features             | 1. <b>Appearance</b> - They have <b>brown and orange coat, white whiskers</b> and a <b>black scalp</b> .<br>2. <b>Distinctive feature</b> - Unlike other monkey species, colobus monkeys <b>do not have thumbs</b> . Instead of thumbs, they have a small remnant bump.<br>3. <b>Nature</b> - They are primarily <b>arboreal</b> and are mostly restricted to humid forests.<br>4. <b>Diet</b> - They are <b>mainly herbivores and thus feed upon young leaves</b> , flowers, and unripe fruit. They are also known to <b>eat charcoal or clay</b> which help them to <b>combat</b> |



the cyanide some leaves may contain.

### What are the Threats to the Red Colobus Monkey

There have been various threats to the survival of the primitive species:

- a) **Habitat loss**- It is the primary threat to colobus monkeys today due to **expansion of human populations**.
- b) **Hunting**- They have been hunted for their **beautiful fur and skin** as it has been used to make dance costumes, hats, and capes.
- c) **Predators**- They are often **preyed upon by other predators** such as chimpanzee, leopard etc.

### What Conservation efforts are required

Being an indicator species, red colobus monkey needs conservation measures such as:

- a) **Financial support**-More **economic investment to create and manage protected areas** for red colobus monkeys.
- b) **Community engagement**- There is need to **provide support to and engaging with communities** that live in proximity to these primates.
- c) **Survey based study**-**Survey should be carried out** to estimate the exact populations of these monkeys and creating awareness about their conservation value.
- d) **Legal safeguard**- They **require legal safeguards** and should be **designated as priority species for conservation** in national legislations and international agreements.

## Why Oleander flowers Banned by Kerala temple boards?

### Why in the News?

Two temple boards in Kerala have **prohibited the use of oleander flowers** in offerings. This decision follows the tragic death of a 24-year-old woman who accidentally consumed oleander leaves.

### About oleander flowers



Figure 9. Source: [thespruce.com](https://www.thespruce.com)

**1. About oleander flowers:** Nerium oleander is commonly known as **oleander or rosebay**. It is a globally cultivated plant found in **tropical, subtropical, and temperate regions**.

**2. Use:** It is renowned for its ability to **withstand drought conditions**. It is frequently used for **ornamental and landscaping purposes**. It is

also used for medicinal purposes.

**3. Varieties and Names in Kerala:** In Kerala, locally known as **arali** and **kanaveeram**. It is grown along highways and beaches, serving as natural green fencing. Different varieties of oleander exist, each with flowers of varying colours.

**4. Traditional Medicinal Use:** It is used in treatment of **vrana** (infected wounds), **kustha** (skin diseases including leprosy), **krimi** (microbes and parasites), **kandu** (itching).

#### 5. Why Oleander flowers Banned by Kerala temple boards?

Despite medicinal use, oleander is toxic.

i) This is due to the properties of **cardiac glycosides** (a type of chemical) including **oleandrin**, **folinerin**, and **digitoxigenin**, which are present in all parts of the plant.

ii) Cardiac glycosides have **therapeutic value in heart conditions** but have a narrow therapeutic window, leading to frequent overdose and toxicity.

iii) **Toxic effects** include nausea, diarrhoea, vomiting, confusion, irregular heartbeat, and, in severe cases, death. Ingestion or inhalation of smoke from burning oleander can also be intoxicating.

iv) Symptoms typically last for 1 to 3 days and may necessitate hospitalization. Fatalities are uncommon.

### Peregrine Falcon

#### Why in the News?

The Madras Naturalist's Society's Project Raptor Watch (PRW) has been actively monitoring peregrine falcons in Chennai for two years. Their objective is to document, study, and monitor various raptor species across select districts of Tamil Nadu.

#### About Peregrine falcon

## Factly Compilation for the Month of May 2024



Source: The hindu

| Aspects      | Description  |
|--------------|--|
| About        | 1. It ( <i>Falco peregrinus</i> ) holds the distinction of being the most extensively distributed bird of prey globally. 2. It is not only recognized as the <b>fastest bird on the planet</b> but also holds the title of the <b>fastest animal in the world</b> .                          |
| Distribution | They are found across all continents except Antarctica, as well as on numerous oceanic islands.  |
| Habitat      | 1. They typically inhabit open landscapes like <b>grasslands, tundra, and meadows</b> .<br>2. They are most commonly sighted in <b>tundra and coastal regions</b> , but are rare in subtropical and tropical environments.<br>3. They <b>build nests</b> on cliff faces and within crevices. |



## Factly Compilation for the Month of May 2024

|                            |  |
|----------------------------|--|
| <b>Nature</b>              | 1. Peregrine Falcons are <b>diurnal creatures</b> , meaning they are active during the day.<br>2. Outside the breeding season, they tend to <b>lead solitary lives</b> , establishing and defending their territories. |
| <b>Ecological Role</b>     | As <b>apex predators</b> , Peregrine Falcons play a vital role in maintaining the balance of prey populations, particularly pigeons and doves.   |
| <b>Conservation Status</b> | Classified as Least Concern on the IUCN Red List, indicating their population is relatively stable.  |

## UPSC Syllabus: Reports and index

### World Press Freedom Index 2024

#### Why in the News?

In the World Press Freedom Index 2024, India is ranked 159 out of the 180 nations.

#### About World Press Freedom Index:

| Aspects            | Description  |
|--------------------|--|
| <b>About</b>       | The World Press Freedom Index (WPFI) is an annual ranking of countries compiled and published by Reporters Without Borders (RSF).  |
| <b>Purpose</b>     | It compares the level of freedom enjoyed by journalists and media in 180 countries and territories.  |
| <b>Methodology</b> | RSF evaluates countries based on various indicators related to press freedom. These indicators include-<br>a) media independence<br>b) legal framework<br>c) safety of journalists |
| <b>Indicators</b>  | The ranking is based on <b>five Indicators</b> - Political, legislative, economic, sociocultural and safety of journalists.  |

#### Findings of World Press Freedom Index 2024:

Source: The Hindu

**1. India's Press Freedom Ranking:** India is **ranked 159th in the 2024**. It was ranked 161st in the 2023. **This ranking places India alongside nations like the occupied Palestinian territories, UAE, Turkey, and Russia**, indicating poor press freedom.

**2. India's past performance:** India has consistently ranked over 100 since 2003, showing a long-term trend of limited press freedom. The country's press freedom situation has deteriorated rapidly in recent years.

### 3. Global Comparisons:

a) **Scandinavian countries** (Norway, Denmark, Sweden) **top the rankings** with the highest press freedom. **Eritrea, Syria, and Afghanistan** rank the lowest.

b) Among BRICS nations, **Brazil and South Africa** rank higher than India, whereas **China and Russia** are lower. In South Asia, India ranks lower than all countries except Bangladesh.

**4. Global Trends:** The global trend shows a **decline in press freedom**, with an average drop of 7.6 points worldwide, accompanied by an increase in political repression of journalists and media.

a) **Press freedom remains robust primarily in European Union countries**, which recently implemented their first media freedom law (EMFA). In contrast, the **Maghreb and Middle East regions** face the **most severe government-imposed press restrictions**.

b) **Bhutan, Hong Kong, and Afghanistan** have seen significant **declines in press freedom** since 2019 whereas **Central African Republic, Timor-Leste, and Montenegro** have shown **notable improvements**.

**Read more:** [World Press Freedom Index 2023](#)

## Travel & Tourism Development Index 2024

### Why in News?

India has raised its ranking in the newly released Travel & Tourism Development Index compared to the previous report.

### About Travel & Tourism Development Index 2024

1. This index is second edition and it has evolved from a flagship series produced by the **World Economic Forum since 2007**.

2. It is developed in partnership with the University of Surrey and incorporating insights from top Travel & Tourism (T&T) stakeholders, thought leaders, and data partners.

3. It evaluates the factors and policies that facilitate sustainable and resilient T&T development.

4. India holds the 39th position, making it the highest-ranked nation in South Asia and among other lower-middle-income economies. **This is a notable rise from the 54th position in 2021.**

### 2. Factors Influencing India's Improved Ranking:

**a) Cultural and Natural Attractions:** India's rich cultural heritage and diverse landscapes contribute significantly to its appeal as a travel destination.

**b) Investments in Tourism:** Increased investments in tourism infrastructure, along with efforts to enhance sustainability and safety in travel and tourism, have positively impacted India's ranking.

**c) Competitive Advantages:** India is highly ranked for its price competitiveness (18th), air transport (26th), and ground and port infrastructure (25th).



## Factly Compilation for the Month of May 2024

It stands out as one of only three countries ranked in the top 10 across all resource pillars, with Natural Resources at 6th and Cultural and Non-Leisure Resources at 9th.

### Challenges and Current Performance

**a) Performance Decline Since 2019:** Despite the overall improvement, India's TTDI score in 2024 is 2.1% lower than in 2019, influenced by global inflation and supply issues.

**b) Recovery from Pandemic:** While there has been a decline in price competition, and air transport and tourist services have not fully rebounded to 2019 levels, there is optimism as the sector begins to recover post-pandemic.

### Global Tourism Trends and Outlook

The lifting of COVID-19 travel restrictions and increased travel demand are expected to drive a significant resurgence in international tourist arrivals.

The travel and tourism sector's contribution to global GDP is anticipated to return to pre-pandemic levels this year, boosting the global industry.

## UPSC Syllabus: International relations

### Global biofuel alliance

#### Why in the News?

Recently, the Ministry of Petroleum and Natural Gas has stated that the Global Biofuel Alliance (GBA) has initiated a work plan. This plan concentrates on evaluating national contexts, formulating policy frameworks, and organizing biofuel workshops.

#### Global biofuel alliance

Source: The Indian Express

| Aspects      | Description  |
|--------------|--|
| <b>About</b> | 1. The Global Biofuel Alliance (GBA) was launched on the <b>sidelines of the 2023 G20 summit in New Delhi</b> .<br>2. The Alliance is <b>focused on securing the supply of biofuels</b> , ensuring affordability and sustainable production of biofuels. |
| <b>Aim</b>   | It aims at <b>facilitating international cooperation and intensifying the use of sustainable biofuels</b> . It aims to facilitate global biofuels trade and provide technical support for national biofuel programmes.                                   |

## Factly Compilation for the Month of May 2024

|                   |   |
|-------------------|---|
| <b>Membership</b> | <p><b>1. Member nation:</b> It has been initiated by India, the United States, and Brazil. It has nine member countries: India, the US, Brazil, Argentina, Bangladesh, Italy, Mauritius, South Africa, and the UAE.</p> <p><b>2. Organisation members:</b> The World Bank, Asian Development Bank, World Economic Forum, International Energy Agency, International Energy Forum, International Renewable Energy Agency, and International Civil Aviation Organization are among the organisations that have agreed to join the alliance.</p> |
| <b>Functions</b>  | <p>1. The Global Biofuel Alliance aims to increase biofuel usage by:</p> <ul style="list-style-type: none"><li>a) Facilitating advancements in biofuel technology</li><li>b) Promoting the use of sustainable biofuels to address concerns about indirect land use change (ILUC),</li><li>c) Developing robust standards and certifications.</li></ul> <p>2. It will serve as a knowledge centre to enhance global cooperation and ensure the secure and affordable availability of biofuels.</p>   |

### About Biofuel

**1. About Biofuels:** It refers to renewable fuels derived from biomass—from plants or agricultural, animal, domestic, and industrial biowaste. Biofuels are significantly cleaner than the conventional fossil fuels.

**2. Biofuel Potential:** The International Energy Agency (IEA) forecasts a significant surge in biofuel production by 2050, projecting growth of 3.5-5 times, driven by global Net-Zero targets. This presents a substantial opportunity for India.

**3. India's Contribution to Global Biofuel Procurement:** In 2022, a record-breaking 171.2 billion liters of biofuels were procured worldwide, with India accounting for a mere 2.7%, or 4.6 billion liters. India also maintains its position as the third-largest ethanol producer globally, trailing only the United States (US) and Brazil.

## UPSC Syllabus: International relation

### Antarctic Treaty Consultative Meeting

#### Why in the news?

India plans to announce its intention to build a new research station in Antarctica at the Antarctic Treaty Consultative Meeting which will be held in Kochi later this month.

#### About the Antarctic Treaty Consultative Meeting

| Aspects | Description |
|---------|-------------|
|---------|-------------|

## Factly Compilation for the Month of May 2024

|                                |  |
|--------------------------------|--|
| <b>What is it?</b>             | <p>The Antarctic Treaty Consultative Meeting (ATCM) is an annual gathering of the Parties to the <b>1959 Antarctic Treaty</b>.</p> <p>The ATCM consists of the <b>original twelve signatories of the Antarctic Treaty</b> and other nations that conduct significant research in Antarctica.</p>   |
| <b>Purpose</b>                 | <p>Its primary goals are to <b>share information, discuss issues of mutual interest related to Antarctica</b>, and <b>propose measures</b> to governments in line with the Treaty's principles.</p>  |
| <b>Frequency and Hosting</b>   | <p>1. The ATCM has been an <b>annual event since 1994</b>.</p> <p>2. Hosting duties <b>rotate among the Consultative Parties</b> in alphabetical order of their English names.</p> <p><b>3. Participants include:</b></p> <p>a. Consultative Parties: Original Treaty signatories and others conducting substantial research.</p> <p>b. Non-Consultative Parties: Countries with an interest in Antarctic affairs.</p> <p>c. Observers and Experts: Organizations like the Scientific Committee on Antarctic Research (SCAR) and the International Association of Antarctica Tour Operators (IAATO).</p> |
| <b>Decision-Making Process</b> | <p>The ATCM makes decisions through Measures, Decisions, and Resolutions:</p> <p>a. Measures are <b>legally binding once ratified</b> by all Consultative Parties.</p> <p>b. Decisions relate to the ATCM's organizational matters and are <b>non-binding</b>.</p> <p>c. Resolutions offer guidance and are <b>not legally enforceable</b>.</p> <p>Although only Consultative Parties have decision-making power, all members contribute to discussions.</p>   |

### About CEP

1. The Committee for Environmental Protection (CEP) is a **key advisory body** established under the **Protocol on Environmental Protection to the Antarctic Treaty**, commonly known as the Madrid Protocol, which was adopted in **1991**.
2. The primary role of the CEP is to **provide advice and recommendations to the Antarctic Treaty Consultative Meeting (ATCM)** on matters concerning the conservation and environmental protection of Antarctica.
3. This includes **overseeing the implementation of the Madrid Protocol** and suggesting new ways to enhance the environmental stewardship of the Antarctic region.

## U.N. Counter-Terrorism Trust Fund

### Why in the news?

India recently donated \$500,000 to the UN Counter-Terrorism Trust Fund, reinforcing its steadfast dedication to the global battle against terrorism.

### About United Nations Counter-Terrorism Trust Fund (UNCTF)

| Aspects              | Description  |
|----------------------|--|
| What is it?          | 1. It was established in 2009 and subsequently incorporated into the UN Office of Counter-Terrorism (UNOCT) in 2017.<br>2. This framework allows the UNCTF to effectively address the evolving challenges of global terrorism by fostering international cooperation and strengthening the capacities of vulnerable regions. |
| Focus                | The programs funded are primarily focused on enhancing the capacity of member states in eastern and Southern Africa to tackle the significant challenges of financing terrorism and curtailing the movement and travel of terrorists.  |
| Contributors         | The fund accepts donations from a broad array of contributors, including governments, intergovernmental and non-governmental organizations, private institutions, and individual donors.   |
| Contribution Types   | Contributions can be unrestricted or specifically earmarked for one of UNOCT's global programs or targeted initiatives.  |
| Use of Contributions | India's recent financial contribution is specifically aimed at bolstering UNOCT's initiatives, such as the Countering Financing of Terrorism (CFT) and the Countering Terrorist Travel Programme (CTTP).   |

### About UN Office of Counter-Terrorism (UNOCT)

**1. About UN Office of Counter-Terrorism (UNOCT):** It was established on June 15, 2017, by the United Nations General Assembly.

**2. Purpose:** The UN Office of Counter-Terrorism (UNOCT) serves as a pivotal entity in the global counter-terrorism efforts.

#### **3. Functions and responsibilities of UNOCT:**

**a) Leadership Role:** UNOCT provides guidance on the counter-terrorism mandates that the General Assembly has entrusted to the Secretary-General, coordinating efforts across the United Nations system.

**b) Coordination and Coherence:** The office enhances coordination among the entities of the Global Counter-Terrorism Coordination Compact to ensure the effective implementation of the four pillars of the UN Global Counter-Terrorism Strategy.

## UPSC Syllabus: International Organisation

### NHRC Accreditation Deferred by GANHRI

#### Why in the News?

India's human rights record suffered a setback as the Geneva-based Global Alliance of National Human Rights Institutions (GANHRI), affiliated with the United Nations, deferred the accreditation of the National Human Rights Commission-India (NHRC) for the second consecutive year.

#### Reasons for NHRC Accreditation Deferral by GANHRI:

1. Lack of Transparency in Member Appointments: GANHRI cited concerns over transparency in the process of appointing members to the NHRC. Transparency is crucial for ensuring credibility and impartiality in human rights investigations and interventions.
2. Appointment of Police Officers for Human Rights Investigations: GANHRI raised objections regarding the appointment of police officers to oversee human rights investigations. This practice might compromise the independence and integrity of investigations, raising doubts about the impartiality of the NHRC.
3. Gender and Minority Representation: The NHRC's member panel was criticized for lacking adequate representation of gender and minority groups. Inclusivity is essential for ensuring that diverse perspectives are considered in addressing human rights issues effectively.

#### Challenges in Implementing Recommendations:

- i) Some of the demands made by the international peer review report were difficult to undertake during the election process in India.
- ii) Structural changes and suggestions provided by GANHRI were not feasible to implement at the time due to the ongoing general elections.

#### Review Process and Future Outlook

- i) The NHRC's accreditation deferral is expected to be reviewed later this year, potentially during meetings in September, or again in May next year.
- ii) Suspension of 'A' status for two consecutive years (2023 and 2024) marks a significant setback for India's human rights record and its international standing.

Read More: [Accreditation by the GANHRI](#)



## U.N. award on gender advocacy

### Why in News?



Recently, Major Radhika Sen was awarded the U.N. Military Gender Advocate of the Year Award for 2023.

Source: NDTV

1. Major Radhika Sen who is an Indian peacekeeper in Congo, received

the U.N. Military Gender Advocate of the Year Award for 2023. U.N. Secretary General António Guterres presented the award.

2. Major Sen commanded an engagement platoon in eastern Democratic Republic of the Congo from March 2023 to April 2024 which is part of an Indian rapid deployment battalion. Her platoon included 20 women and 10 men.

3. This award was bestowed upon her for her exceptional service and involvement in gender-focused initiatives within the UN peacekeeping mission MONUSCO.

4. Major Sen is the second Indian peacekeeper to receive this prestigious honor, following Major Suman Gawani, who was a co-recipient in 2019.

### About MONUSCO

1) The UN Security Council established MONUSCO.

2) It took over in 2010, from an earlier UN peacekeeping operation that is the United Nations Organization Mission in Democratic Republic of the Congo (MONUC)

3) It's one of the largest UN peacekeeping efforts employing approximately 16,300 individuals.

4) The primary role of MONUSCO is to protect civilians from violence, particularly in conflict-prone areas like North Kivu.

5) MONUSCO is notable for its use of UAVs for monitoring purposes which is a first in UN peacekeeping history.

6) It features an Intervention Brigade which was authorized in 2013 to conduct targeted offensive operations against armed groups.

About United Nations Military Gender Advocate of the Year Award

## Factly Compilation for the Month of May 2024

1. The United Nations Military Gender Advocate of the Year Award recognises the dedication and effort of an individual peacekeeper in promoting the principles within the United Nations Security Council Resolution 1325.
2. It was created in 2016 by the Office of Military Affairs within the Department for Peace Operations (DPO).
3. The Military Gender Advocate of the Year Award recognizes a military peacekeeper who has best integrated a gender perspective into peacekeeping activities.
4. Each year, the awardee is selected among candidates nominated by Force Commanders and Heads of Mission from all peace operations.

### Chabahar Port Operation Pact

#### Why in the News?

India and Iran recently signed a 10-year contract to operate the Chabahar port.

#### About India-Iran Chabahar Port Agreement



Figure 10. Source: Bharat Shakti

for Chabahar-related infrastructure projects.

1. India and Iran have signed a 10-year contract for the operation of the Chabahar port. This agreement comes eight years after the initial establishment of the general cooperation framework.
2. **Signing Parties:** The contract was signed between Indian Ports Global Ltd. (IPGL) and Iran's Port and Maritime Organisation (PMO).
3. **Investment and Credit Line:** IPGL plans to invest approximately \$120 million in equipping the port and its infrastructure. Additionally, India has offered a credit window worth \$250 million
4. **Historical Context:** A memorandum of understanding for Chabahar port development was signed in May 2015, with the contract executed in May 2016 during Prime Minister Narendra Modi's visit to Iran.
5. **Significance:** The agreement has been termed as a historic milestone for the maritime sector.
  - i) It is expected to foster trade, marine cooperation, and transshipment, while boosting trilateral trade between India, Iran, and Afghanistan.

ii) **Regional Connectivity:** Chabahar port serves as a **vital trade artery** connecting India with Afghanistan and Central Asian countries. Its development is seen as crucial for enhancing regional connectivity and promoting economic development in the region.

iii) **Strategic Importance:** It is located in **Iran's Sistan-Baluchistan province**. Chabahar is a **deep-water port** with significant strategic value. It offers India an alternative route **to access Afghanistan and Central Asia**, bypassing Pakistan.

iv) The agreement **signifies India's commitment to further invest in Chabahar port**, enhancing its efficiency and capacity. India aims to utilize the port for humanitarian aid shipments, demonstrating its commitment to regional development beyond commercial interests.

Read more: [Chabahar port](#)

## UPSC Syllabus: International relations

### ASEAN-India Trade in Goods Agreement Joint Committee

#### Why in the News?

The 4th Joint Committee meeting to review the ASEAN-India Trade in Goods Agreement (AITIGA) took place in Putrajaya, Malaysia, from May 7th to May 9th, 2024.

#### About ASEAN-India Trade in Goods Agreement

1. The ASEAN-India Trade in Goods Agreement represents a **trade accord between India and the ten member states of ASEAN**.
2. It was signed during the **7th ASEAN Economic Ministers-India Consultations** held in **Bangkok, Thailand, in 2009**. This agreement has been pivotal in **fostering economic cooperation**.

#### Key Features of the Agreement

1. The ASEAN-India Free Trade Agreement officially came into **effect in 2010**.
2. It primarily focuses on **facilitating trade in physical goods and products** between the participating nations.

#### 3. Components of AIFTA:

i) **Trade in Goods Agreement:** It **entered into force on January 1, 2010**. It aims to progressively reduce and eliminate duties on 76.4% of goods traded between ASEAN member states and India.

ii) **Trade in Services Agreement:** It was **signed in November 2014**. It covers provisions related to transparency, domestic regulations, recognition, market access, national treatment, and dispute settlement.

## Factly Compilation for the Month of May 2024

iii) **Investment Agreement:** It was also signed in **November 2014**. It ensures fair and equitable treatment for investors, non-discriminatory treatment in expropriation or nationalization, and fair compensation.

