

## DAILY CURRENT AFFAIRS (DCA)

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## HOUSE PANEL SUGGESTS RAISING CREAMY LAYER LIMIT FROM ₹8 LAKH

### Context

- A parliamentary committee on the **welfare of Other Backward Classes recommended raising the ₹8 lakh income limit** for “creamy layer” within OBCs.

### Key Recommendations

- **Income Limit for Creamy Layer:** Raising the income limit for determining the creamy layer among OBCs after consulting stakeholders.
  - ♦ This is to ensure **more backward class people benefit** from reservation policies and welfare schemes.
  - ♦ The income limit for creamy layer was introduced in **1993 at ₹1 lakh** and has been raised several times, **last in 2017 to ₹8 lakh**.
- **Data Transparency in Job Quotas:** Recommended the government to make data on Central job quota implementation publicly available, ensuring transparency.
  - ♦ The DoPT has created a portal (RRCPS) for monitoring this data, but currently, it is accessible only to concerned ministries.
- **Uniform Formula for Income Calculation:** The committee highlighted that different states calculate the creamy layer income limit differently and recommended the **Centre establish a uniform formula**.
- **Equivalence of Posts in Autonomous Bodies:** The committee called for the quick establishment of equivalence of posts in autonomous bodies with those in Central and State governments.
  - ♦ This delay has caused OBC candidates who cleared UPSC exams to miss service allocations.
- **Scholarship Income Limit:** The committee recommended raising the **current ₹2.5 lakh income limit for OBC scholarships**.
  - ♦ It suggested doubling the income limit for pre- and post-matric scholarships and raising limits for top-class scholarships for school and college education.
- **Expansion of Scholarship Coverage:** The committee suggested extending the pre-matric scholarship for OBCs to include students from Class V onwards (currently available for Class IX and X).
- **Increase in Top-Class Scholarships:** The committee proposed increasing the number of slots (currently 15,000) for top-class school education **scholarships for OBCs, EBCs, and DNTs, based on demand**.

### Creamy Layer Principle

- It is a concept used to ensure that reservations in educational institutions and government jobs are extended to those **who are economically and socially disadvantaged within a certain group**.
  - ♦ It aims to **prevent the more affluent or advantaged members** of a reserved category from availing themselves of these benefits.
- **Origin:** The concept was first articulated by the **Supreme Court of India** in the **Indra Sawhney case (1992)**, also known as the **Mandal Commission case**.
  - ♦ The Court's ruling emphasized that within the OBC (Other Backward Classes) category, those who are **relatively more privileged should not benefit from reservations**.
- **Impact:** By applying the creamy layer principle, the government aims to make its affirmative action policies more effective and equitable, ensuring that those who are most in need receive the support intended for them.

### Need for the Creamy Layer Concept

- **Prevents Misuse:** Ensures economically well-off or socially advanced OBCs don't exploit the reservation system.
- **Adds Transparency:** Clear income thresholds for determining the creamy layer increase fairness and transparency in the reservation process.
- **Promotes Social Mobility:** Helps disadvantaged OBCs access education and jobs, fostering upward social mobility.
- **Fosters Social Justice:** Ensures that reservation benefits serve those who are most in need, maintaining fairness and inclusion.

### Constitutional Provisions

- **Article 16:** It provides for **equality of opportunity** for all citizens but as an exception the State can provide for reservation of appointments or posts in favour of any backward class that is not adequately represented in the state services.
- **Article 16 (4A):** Provides that the State can make any provision for reservation in matters of promotion in favour of the Scheduled Castes and the Scheduled Tribes if they are not adequately represented in the services under the State.
- **Article 335:** It recognises that special measures need to be adopted for considering the claims of SCs and STs to services and posts, in order to bring them at par.
- **103 Amendment of the Constitution of India:** Introduced **10% reservation** for Economically Weaker Sections (EWS) of society.

Source: TH

## TACKLING THE DISINFORMATION THREAT IN INDIA

### Context

- India, with its rapidly growing digital landscape, faces an escalating challenge of disinformation.

### Disinformation Threat in India

- Disinformation, the intentional spread of false or misleading information, poses a significant challenge to India's socio-political and economic stability.
- India, with over 1.4 billion people and a multilingual landscape, is uniquely vulnerable to disinformation.
- According to the **Global Risks Report 2025 of World Economic Forum (WEF)**, misinformation and disinformation are the most pressing short-term global threats.
  - India is particularly vulnerable to manipulated narratives, voter influence, and economic disruptions, with **over 900 million Internet users**.
  - WEF defines 'global risk' as an event that can adversely affect a sizable portion of the population, the global GDP, and natural resources.

### Factors Contributing to Disinformation

- Technological Penetration:** The rapid adoption of smartphones and cheap internet access has democratized information but also amplified the spread of false content.
  - Digital India Report (2023) of MeitY** highlighted that WhatsApp accounted for 64% of misinformation spread, followed by Facebook (18%) and Twitter (12%).
  - Encrypted platforms** like WhatsApp make it difficult to trace the origin of false information.
- AI-Generated Content & Algorithmic Biases:** The rise of AI-generated misinformation makes it increasingly difficult to distinguish truth from deception.
  - Algorithmic biases further amplify misleading narratives.
- Declining Trust in Traditional Media:** Public trust in legacy media is dwindling, leading citizens to rely more on social media for news.
  - It has resulted in widespread sharing of unverified information.
- Political Polarization:** Disinformation is often weaponized by political actors and non-state entities to exploit digital platforms and influence elections and manipulate public opinion.

- A study by the Indian School of Business and the CyberPeace Foundation reveals that **political disinformation accounts for 46%**, followed by **general issues (33.6%)** and **religious content (16.8%)**.

- Lack of Digital and Media Literacy:** A significant portion of the population lacks the skills to critically assess the credibility of online content.
- Weak Regulatory Framework:** While laws like the IT Act, 2000, and its amendments address certain aspects of online harm, enforcement remains a challenge.
- Linguistic Diversity:** Disinformation spreads easily due to India's multilingual population, with fake news often tailored to regional languages.

### Negative Impacts of Disinformation

Category	Impact
<b>Undermines Democracy</b>	Misleads voters and manipulates public opinion
	Reduces trust in elections, media, and public institutions
<b>Incites Violence and Social Unrest</b>	Fuels communal tensions, hate crimes, and mob lynchings
	Spreads conspiracy theories that provoke extremist behavior
<b>Public Health Threats</b>	Promotes vaccine hesitancy and fake cures
	Undermines scientific and medical advice (e.g., during COVID-19)
<b>Economic Disruption</b>	Causes panic in financial markets
	Damages reputations of businesses

### Challenges in Countering Disinformation

- Speed of Digital Platforms:** Rapid spread of misinformation, amplified by AI-generated content, outpaces the ability to fact-check and counter it in real time.
- Remoteness of Fact-Checkers:** Corrections and clarifications often don't reach the original audience exposed to the misinformation.
- Data Encryption:** Platforms like WhatsApp and Telegram use end-to-end encryption, making it difficult to monitor or counter misinformation.



- **Media Illiteracy and Vulnerable Groups:** Older adults (65+) are more vulnerable—3 to 4 times more likely to share fake news compared to younger users.

#### Government Initiatives to Counter Disinformation

- **Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021:** Strengthened regulations for social media platforms and digital news outlets to curb the spread of fake news.
- **Press Information Bureau (PIB) Fact-Check Unit:** Established to debunk misinformation related to government policies and programs.
  - ♦ It provides clarifications through official channels and social media platforms.
- **National Cyber Coordination Centre (NCCC):** Aimed at monitoring cyber threats, including misinformation campaigns that could harm national security.
- Initiatives like **Shakti – India Election Fact-Checking Collective** and the **Deepfake Analysis Unit** have played a role in tackling disinformation during elections.
- **Financial Literacy Campaign of RBI** is essential for fostering critical thinking and societal resilience.
- **Samvad Initiative:** A collaboration between the government and private entities to foster digital literacy and educate users about identifying fake news.
- **Election Commission of India (ECI)** launched an AI-based monitoring system in 2024 to track and remove fake political advertisements and deepfake videos.

#### Policy Recommendations

- **Regulatory Frameworks:** India needs to adopt policies similar to the **European Union's Digital Services Act**, which combats Disinformation and

Foreign Information Manipulation and Interference (FIMI).

- **AI Oversight & Accountability:** Supervisory boards and AI councils should oversee generative AI practices to prevent algorithmic biases and misinformation.
  - ♦ Investing in AI tools to detect deepfakes and other sophisticated forms of misinformation.

#### Conclusion

- Addressing the disinformation threat in India requires a multifaceted approach involving government regulation, media literacy campaigns, technological tools, and collaboration between stakeholders.
- As India continues its digital transformation, ensuring the credibility and authenticity of information must remain a national priority.

Source: TH

## INDIA'S DEFENCE EXPORTS HIT NEW RECORD

#### In News

- India has achieved a significant milestone in its defence sector, with **defence exports touching a record ₹23,622 crore in FY 2024-25** — marking a 12.04% growth over the previous year's figure of 21,083 crore.

#### What's Driving the Growth?

- Simplified industrial **licensing procedures**.
- **De-licensing of parts/components**.
- Extension of license validity.
- Easier **Standard Operating Procedures (SOPs)** for export authorisation.
- Enhanced international trust in **Made-in-India military hardware**.

#### Key Policy Initiatives

Initiative	Description
<b>Defence Production and Export Promotion Policy (DPEPP) – 2020</b>	Aims to achieve defence exports worth 50,000 crore by 2029. Focus on building a robust manufacturing ecosystem including private sector and MSMEs.
<b>Simplified Export Authorization Process</b>	The online portal under DDP facilitates fast export clearance. 1,762 authorizations issued in FY 2024-25, a 16.92% rise over last year.
<b>Strategic Partnership (SP) Model</b>	Enables Indian private firms to partner with foreign OEMs to co-develop and manufacture high-tech defence platforms. Boosts tech transfer.
<b>Industrial Licensing Reforms</b>	Removal of licensing for parts/components and extension of license validity reduces compliance burden for startups and MSMEs.

<b>Defence Attaches Empowered for Export Promotion</b>	Financial powers given to defence attachés abroad to promote exports, engage buyers, and participate in expos.
<b>Export Promotion Cell in DDP</b>	Dedicated cell in DDP coordinates with industry and governments to streamline export procedures and resolve issues.
<b>Participation in International Defence Exhibitions</b>	India regularly organises defence expos like Aero India, DefExpo, IDEX, enhancing brand visibility.
<b>Encouraging MSMEs and Startups</b>	iDEX platform supports over 250 startups with funding and incubation for export-ready innovation in AI, drones, etc.
<b>Make in India &amp; Atmanirbhar Bharat Abhiyan</b>	Mission to promote indigenous manufacturing. Offers production-linked incentives and promotes import substitution.

### Significance of India's Rising Defence Exports

- **Strengthening Indigenous Defence Production:** Defence production rose by 174% from 2014-15 to 2023-24, signaling India's successful shift from import-dependence to Atmanirbhar Bharat (self-reliant India).
  - ♦ This will promote domestic innovation, manufacturing, and reduced reliance on foreign military technology.
- **Progress Toward Strategic Export Targets:** India is on course to achieve its ₹50,000 crore defence export target by 2029.
- **Catering to Global Demand:** Exports to nearly 80 countries reflect growing international trust in Indian-made defence systems.
- **Encouraging Private Sector Participation:** In FY 2024-25, private players contributed 15,233 crore in exports, showcasing a thriving defence startup and MSME ecosystem.
  - ♦ Enhances employment, investments, and R&D in the defence sector.
- **Boosting Diplomatic and Strategic Leverage:** Enhances India's soft power and influence in regional and global security architecture.

### Key Challenges in Defence Exports

- **Technological Dependence:** Reliance on foreign tech limits indigenous development and export competitiveness.
- **DPSU Underperformance:** Slower innovation, bureaucracy, and weak marketing hinder export potential.
- **Policy Implementation Delays:** Lag between policy and execution slows down exports.
- **Limited Global Reach:** Struggling to penetrate established markets against strong competition.
- **Low Volume, High Diversity:** Lack of high-demand, scalable flagship products.
- **Quality & Support Gaps:** Need improvement

in product quality, certifications, and after-sales service.

- **Weak Industrial Ecosystem:** Underdeveloped supply chain, skilled workforce, and infrastructure.

Source: TH

## SPACEX'S FRAM2 MISSION

### In News

- SpaceX launched the **Fram2 mission**, sending the first private astronaut crew on a groundbreaking journey to **orbit Earth from pole to pole**.

### Historical Linkages

- It was named after the **Norwegian ship "Fram,"** which was instrumental in early 20th-century polar exploration.
- The Fram participated in expeditions and played a significant role in reaching the **Arctic and Antarctic regions**.
- **Fram2 mission** honors the ship's legacy.

### SpaceX's Fram2 mission

- The Fram2 mission lifted off atop a Falcon 9 rocket from **NASA's Kennedy Space Center, Florida**, sending the **Crew Dragon capsule "Resilience"** into a polar orbit.
- It also allows scientists to study how astronauts' bodies respond to **weightlessness and motion sickness**.
- It will last between 3 to 5 days, with the crew traveling in a novel orbital path to perform various experiments.
- The crew will perform the **first-ever x-ray in space**, providing insights into how microgravity affects bone and muscle density.
- It will also focus on **cultivating mushrooms in space**, which could offer valuable insights into

**sustainable food production** for future space missions.

#### Post-Mission Task

- After returning to Earth, the crew plans to exit the Dragon spacecraft unassisted, aiding research on astronauts' ability to perform tasks without medical or operational help after spaceflight.

#### About Earth's Polar Orbit

- A polar orbit is when a satellite travels around Earth passing over or near the North and South Poles.
- A deviation of up to 10 degrees from the exact poles is still considered a **polar orbit**.
- Polar orbits fall under the category of Low Earth Orbit (LEO). Typical height range is 200 to 1000 km above Earth's surface.

#### Significance

- As the Earth rotates beneath it, a satellite in a polar orbit can eventually scan the entire planet.
- **Extremely useful for:** earth mapping and remote sensing, environmental monitoring & military and reconnaissance (spy) satellites.

#### Challenges

- Launching into a polar orbit requires more fuel. This is because rockets cannot take advantage of Earth's rotational speed, unlike in equatorial launches.

Source :IE

## INDIA'S AIR POLLUTION CONCERN

### Syllabus: GS3/Environmental Pollution

#### Context

- India's air pollution crisis is a persistent issue causing **severe health problems, with cities regularly topping global pollution rankings**.

#### World Air Quality Report 2024

- **Thirteen of the world's top 20 most polluted cities are in India**, with Byrnihat on the Assam-Meghalaya border being the most polluted.
- **India is the fifth most polluted country in the world**, with an average Air Quality Index (AQI) of 50.6  $\mu\text{g}/\text{m}^3$  – 10 times higher than the World Health Organization's (WHO) annual PM<sub>2.5</sub> guideline value of 5  $\mu\text{g}/\text{m}^3$ .
- **Delhi continues to be the most polluted Capital city** in the world with an average PM<sub>2.5</sub> concentration of 91.8  $\mu\text{g}/\text{m}^3$ .

#### Air Pollution

- **When harmful substances (pollutants)** – particles, gases, or matter – are released into the air and reduce its quality, the air is polluted.
- **Common air pollutants include:** Particulate Matter (PM), Nitrogen Dioxide (NO<sub>2</sub>), Sulfur Dioxide (SO<sub>2</sub>), Ozone (O<sub>3</sub>), Carbon Monoxide (CO), Volatile Organic Compounds (VOCs), Lead etc.
- **Source:** These pollutants can originate from natural sources such as volcanic eruptions and wildfires, but human activities such as industrial production, transportation, agriculture, and residential heating are significant contributors to air pollution.
- **Concerns:**
  - ♦ **Health Related:** Respiratory issues, cardiovascular problems, reduced lung function.
  - ♦ **Environmental:** Ecosystem damage, Biodiversity loss, Water pollution, climate change, crop damage.
  - ♦ **Healthcare Costs:** The health impacts of air pollution result in increased healthcare costs, including expenses related to the treatment of respiratory and cardiovascular diseases.

#### Reasons for High Level of Air Pollution in India

- **Vehicular Emissions:** High number of old, inefficient vehicles and dependence on diesel and petrol contribute to air pollution.
- **Industrial Emissions:** Large-scale industries, especially coal-based power plants, contribute significantly to air pollution.
- **Burning of Biomass:** Widespread use of crop residue burning and solid fuels like wood and cow dung for cooking in rural areas.
- **Construction Dust:** Rapid urbanization leads to construction activities, generating significant amounts of dust and particulate matter.
- **Waste Burning:** Open burning of garbage and waste is common, especially in urban and semi-urban areas, releasing harmful pollutants.
- **Population Density:** Overcrowded cities with high vehicular traffic and industrial activity increase pollution levels.
- **Climate and Geography:** Seasonal weather patterns, especially during winters, cause pollutants to remain trapped in the air, exacerbating smog and haze.
- **Deforestation:** Loss of green cover reduces the natural filtration of air, leading to higher pollution levels.

**Government Initiatives**

- **National Clean Air Programme (NCAP):** Launched in 2019, NCAP is a comprehensive initiative with the goal of reducing air pollution in identified cities and regions across India.
  - ♦ The program focuses on improving air quality monitoring, implementing stricter emission standards, and promoting public awareness.
- **Bharat Stage VI (BS-VI) Emission Standards:** The government implemented BS-VI emission standards for vehicles nationwide in 2020.
  - ♦ These standards aim to reduce vehicular emissions by mandating the use of cleaner fuel and more advanced emission control technologies.
- **Pradhan Mantri Ujjwala Yojana (PMUY):** The PMUY scheme aims to provide clean cooking fuel to households by promoting the use of liquefied petroleum gas (LPG) as an alternative to traditional biomass-based cooking methods.
- **FAME (Faster Adoption and Manufacturing of Hybrid and Electric Vehicles) Scheme:** The FAME scheme promotes the adoption of electric and hybrid vehicles to reduce air pollution caused by vehicular emissions.
  - ♦ Incentives are provided to both manufacturers and consumers to encourage the use of electric vehicles.
- **Green Initiatives for Sustainable Habitat (GRIHA):** GRIHA is an initiative to promote sustainable and environmentally friendly practices in the construction and operation of buildings.
  - ♦ It encourages the use of energy-efficient technologies and materials to reduce pollution.
- **Waste Management Programs:** It is crucial to prevent the burning of waste, which contributes to air pollution.
  - ♦ Various waste management initiatives, including the Swachh Bharat Abhiyan, aim to address solid waste issues and promote cleaner disposal methods.
- **Commission for Air Quality Management:** The Commission has been set up for Air Quality Management in the National Capital Region and Adjoining Areas for better coordination, research, identification, and resolution of problems surrounding the air quality index.
- **Afforestation Programs:** Initiatives like the Green India Mission aim to increase tree cover, which can help absorb pollutants and improve air quality.

**Way Ahead**

- **National Targets:** India aims to reduce **PM2.5 levels by 40% by 2026**, but more detailed local

data is needed for effective action, such as vehicle types, fuel used, and traffic patterns.

- ♦ The current data gap affects fund utilization and makes air pollution a secondary concern for municipalities.
- **Avoiding the “Western Trap”:** Over-reliance on high-tech solutions and urban-centric tools could divert attention from basic pollution sources like biomass burning, old industrial processes, and polluting vehicles.
  - ♦ India's strategy must remain rooted in on-ground realities rather than imported models.
- **Focus on Implementation:** Separate funding streams for research and immediate interventions are needed. The emphasis should be on short-term, scalable solutions.
- **Global Guidance:** Countries like China, Brazil, California, and London offer lessons on contextual, tailored approaches.
  - ♦ India should innovate based on its own unique needs, focusing on federalism and informal economies.

Source: TH

**NEWS IN SHORT****THE WAQF (AMENDMENT) BILL, 2024****Context**

- The government re-introduced the **Waqf (Amendment) Bill, 2024 in Parliament.**

**Waqf Bill Amendments Overview:**

- **Amends the Waqf Act, 1995**, which governs Waqf property management in India.
- **Waqf by User:** The Bill removes the concept of “Waqf by use,” meaning properties continuously used as Waqf (like mosques) will require official documentation (Waqfnama) to be recognized as Waqf.
- **Survey of Properties:** The Bill replaces the Survey Commissioner with the District Collector or other senior officers to oversee the survey of Waqf properties.
- **Representation on Waqf Boards:** The Bill proposes allowing **non-Muslim Chief Executive Officers and members** to be appointed to state-level Waqf Boards.
- **Application of Limitation Act:** The Bill deletes Section 107 of the 1995 law, making the Limitation Act (1963) applicable to Waqf properties.



- ♦ This change allows someone who has unlawfully possessed Waqf property for more than 12 years to claim it through adverse possession.

#### Reasons for Amendment

- The government argues that the 1995 Act has loopholes in regulating Waqf properties, such as title disputes and illegal occupations.
- The new Bill mandates a unified digital listing of Waqf properties to reduce litigation and ensure transparency.

#### Criticism

- The Bill gives the government power to determine whether a property is Waqf.
- The District Collector, rather than the Waqf Tribunal, will decide disputed properties, treating them as government properties until resolved.
- Opposition parties oppose the amendments, arguing it undermines Muslim community rights.

#### Do you know?

- Waqf refers to properties dedicated exclusively for religious or charitable purposes under Islamic law, and any other use or sale of the property is prohibited.
  - ♦ Waqf means that the ownership of the property is now taken away from the person making Waqf and transferred and detained by Allah.
- In India, the history of Waqf can be traced back to the early days of the **Delhi Sultanate when Sultan Muizuddin Sam Ghaor** dedicated two villages in favour of the Jama Masjid of Multan and handed its administration to **Shaikhul Islam**.

Source: IE

## NITI-NCAER PORTAL ON STATE FINANCES

#### Context

- Finance Minister Nirmala Sitharaman launched the "NITI NCAER States Economic Forum" portal.

#### About

- **Portal Launch:** Developed by NITI Aayog and **National Council of Applied Economic Research (NCAER)**.
- It is a **comprehensive repository of data on state finances** covering the **period 1990-91 to 2022-23**.

- **Purpose:** The portal will act as a **research hub**, offer a historical and real-time data analysis to track state progress, identify trends, and help formulate evidence-based policies for development.

#### Main Components:

- ♦ **State Reports:** Summarizes macro and fiscal data of 28 states, covering demography, economic structure, and fiscal indicators.
- ♦ **Data Repository:** Provides access to a complete database categorized across five verticals: Demography, Economic Structure, Fiscal, Health, and Education.
- ♦ **State Fiscal and Economic Dashboard:** Offers graphical representations of key economic variables and quick access to data through appendices and summary tables.
- ♦ **Research and Commentary:** Includes extensive research on state finances and fiscal policy at both state and national levels.

Source: PIB

## GOVERNMENT SECURITIES

#### In News

- The Reserve Bank of India announced the injection of 80,000 crore by purchasing government securities citing "evolving liquidity conditions."

#### Government security(G-Sec)

- It is a tradeable instrument issued by the Central Government or the State Governments.
- It acknowledges the Government's debt obligation.
  - ♦ Such securities are short term (usually called treasury bills, with original maturities of less than one year) or long term (usually called Government bonds or dated securities with original maturity of one year or more).

#### Scenario In India

- In India, the Central Government issues both, treasury bills and bonds or dated securities while the State Governments issue only bonds or dated securities, which are called the State Development Loans (SDLs).
  - ♦ G-Secs carry practically no risk of default and, hence, are called risk-free gilt-edged instruments.
- RBI acts as the debt manager for the Centre and the States.

Source :TH



## FUTURE CIRCULAR COLLIDER (FCC) FEASIBILITY STUDY

### In News

- CERN and international partners completed a study on the **Future Circular Collider (FCC)**, reflecting contributions from over 1,000 physicists and engineers.

### Future Circular Collider (FCC)

- The FCC aims to succeed the **Large Hadron Collider (LHC) in the 2040s**.
- It will have a 91 km circumference and focus on fundamental physics questions, particularly related to the **Higgs boson**.
- It seeks to address key physics questions left unanswered since the discovery of the Higgs boson in 2012, including the origin of mass and the fate of the universe.
- The FCC could lead to technological advancements with applications in medical fields, fusion energy, electricity transmission, and advanced accelerators.

### Purpose

- It is a proposed particle accelerator designed to collide protons at unprecedented energies, aiming to study fundamental forces and particles. The project will unfold in two phases: the first phase, featuring an electron-positron collider, is expected to begin operations in 2046, while the second phase, a proton-proton collider, is slated for 2070.
  - The FCC will target an energy level of 100 trillion electronvolts, more than seven times higher than the Large Hadron Collider (LHC).

### Do you know ?

- Large Hadron Collider (LHC) is the world's largest and most powerful particle accelerator, has been operational since 2008 and has made significant discoveries, such as the Higgs boson. It is expected to conclude operations by 2041, with the FCC poised to continue advancing research in fundamental physics.

Source :IE

## SATURN GAINED 128 NEW OFFICIAL MOONS

### Context

- Saturn **has "gained" 128 new moons** in a groundbreaking discovery by astronomers in Taiwan.

### About

- Saturn's New Title:**
  - Saturn now holds the **title of "moon champion" with 274 moons**, the most of any planet in the solar system.
  - This **surpasses the total number of moons of all other planets combined**.
- Discovery Details:** Some moons were found during space missions like Voyager 1 and others during "ring-plane crossings."
- Irregular Moons:** All newly discovered moons are classified as "irregular" moons, which have **elliptical orbits at various angles**.
  - Irregular moons were likely once small planets** captured by Saturn's gravity and later shattered by collisions.
  - Regular moons** are formed around a planet at the same time as the planet itself forms.
- Size of Moons:** The new moons are small, **only a few kilometers in size**, but still classified as moons by NASA.
- Insights into Saturn's Rings:** The discovery of irregular moons offers **clues about the formation of Saturn's rings**, believed to be fragments from comets, asteroids, and moons torn apart by Saturn's gravity.
- Naming of Moons:** Saturn's moons typically follow names from Greco-Roman mythology and other mythologies.
  - The 128 new moons are currently named with technical designations (e.g., "S/2020 S 27") and await official names from the International Astronomical Union (IAU).

### About Saturn

- Saturn, is the **second-largest planet** in the Solar System and the **6th** closest planet to the sun.
- Saturn's rings** are composed mainly of water ice, with a minor component of rocky material.
- Titan** is the largest moon of Saturn, larger than Mercury and Pluto.

Source: IE

## GREEN CREDIT PROGRAMME

### In News

- The government is inviting voluntary participation in sectors ranging from plantations to water conservation in exchange of tradable credits under the Green Credit Programme.

### About Green Credit Programme

- Launched by:** Ministry of Environment, Forest and Climate Change (MoEFCC)

- **Officially unveiled:** December 1, 2023, at COP28 in Dubai by PM Modi and UAE President Sheikh Mohammed bin Zayed Al Nahyan
- **Objective:** To incentivize voluntary pro-environmental actions through tradable “green credits”
- **Linked to:** Mission LiFE (Lifestyle for Environment)
- **Participation:** Open to individuals, companies, PSUs, and institutions on a voluntary basis
- **Activities Eligible for Green Credits:** Tree plantation, Eco-restoration (grasses, shrubs, herbs), water conservation (rainwater harvesting, soil moisture conservation), Waste management & air pollution reduction.
- **Incentive Structure:** Participants earn green credits (e.g., 1 grown tree = 1 green credit)
  - ♦ Credits are tradable on a domestic market platform
  - ♦ Can be used for:
    - Meeting compensatory afforestation obligations
    - Environmental social and governance (ESG) under SEBI guidelines

#### Concerns & Criticism

- **Legal flagged:** Ministry of Law and Justice questioned the legality of the trading model.
- **Supreme Court:** Reviewing petition on survival of plantations and legality under amended Forest Act.
- **Ecological concerns:** May incentivize forest diversion by replacing non-forest land with degraded forest land.
  - ♦ Risk of harming ecologically important scrublands and open forests.
- **Key issue:** Undermines “land-for-land” principle of compensatory afforestation.

Source: IE

## MIGRATION PATTERN OF PAINTED LADY BUTTERFLIES

#### Context

- Daria Shipilina, an evolutionary biologist, is studying how genetics contribute to observable traits, or phenotypes, in organisms, with a focus on migration in insects, **particularly butterflies.**

#### About the study

- Researchers studied butterflies from regions in Europe and North Africa, documenting their migration patterns from the Sahara Desert to southern Europe and back.
- Researchers analyzed stable isotopes of hydrogen and strontium in butterfly wings to determine their place of origin, as the isotopic signature remains after the butterflies' larvae stage.

#### Findings of Latest research

- The butterflies follow a **multi-generational migration cycle**, spanning 8-10 generations, with each butterfly living only 2-4 weeks.
- Recent research examines **painted lady butterflies (Vanessa cardui)**, which are known for their long migratory journeys of up to 15,000 km.
- Unlike birds, which have distinct genetic groups for short- and long-distance migration.
  - ♦ It was found that **painted lady butterflies** do not have significant genetic differences based on migration distance.
    - Instead, environmental factors seem to influence migration patterns.

#### Do you know?

- The painted lady butterfly is known for its remarkable ability to thrive in diverse climates, from temperate grasslands to deserts, and is found on **every continent except Antarctica and South America.**
- They are strong flyers, capable of high speeds and altitudes, with specialized thoracic muscles for long-distance flight.
- IUCN Red List status: **Least Concern.**

Source :TH