

## DAILY CURRENT AFFAIRS (DCA)

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## STRENGTHENING AI GOVERNANCE THROUGH TECHNO-LEGAL FRAMEWORK

### Context

- The Office of the Principal Scientific Adviser (OPSA) to the GOI has released a White Paper titled “**Strengthening AI Governance Through Techno-Legal Framework**”, outlining India’s approach to building an accountable, and innovation-aligned artificial intelligence (AI) ecosystem.

### Techno-Legal AI Governance

- The techno-legal approach integrates **legal instruments, regulatory oversight, and technical enforcement mechanisms** directly into the design and operation of AI systems.
  - Governance is treated as an **intrinsic feature of AI systems**, rather than an external compliance obligation.
- This approach ensures that AI systems, **whether developed domestically or sourced globally**, remain aligned with India’s constitutional values, legal norms, and developmental priorities.

### Rationale for a New AI Governance Framework

- Artificial Intelligence is **adaptive, opaque, rapidly evolving, and borderless**, making traditional command-and-control regulation inadequate.
- Existing Indian regulations** such as the Information Technology (IT) Act, 2000, DPDP Act, 2023, Bhartiya Nyaya Sanhita (BNS), 2023, sectoral guidelines, and voluntary standards provide baseline safeguards but are **not designed to address AI-specific lifecycle risks**.
- There is a need for a governance model that **prevents harm proactively**, rather than relying on post-facto legal enforcement.

### Objectives of the Techno-Legal Framework

- The framework seeks to **uphold fundamental rights** such as **privacy, security, safety, access to fair information**, and livelihood protection in the AI era.
- It aims to ensure that **AI systems are trained, deployed, and used** in a manner that guarantees fair treatment and non-discrimination.
- The framework **balances innovation and safety**, rejecting the false binary of “innovation versus regulation.”

### Technological pathways to Techno-Legal AI Governance

- The **IndiaAI Mission**, under its “**Safe and Trusted AI**” pillar, reflects India’s shift towards

embedding legal, ethical, and safety safeguards directly into AI systems.

- In 2024, MeitY launched a national “**Responsible AI**” call, selecting indigenous solutions for operationalising AI governance across government and industry.
- AI Auditing Tools:**
  - Nishpaksh (fairness audits) and ParakhAI (participatory algorithm audits).
  - Track-LLM for governance testing of large language models.
- Integration with Digital Public Infrastructure (DPI):** Integration of techno-legal AI tools with India’s Digital Public Infrastructure (DPI) enhances scalability and enforceability.
  - Platforms such as **Aadhaar, DigiLocker, and UPI provide secure**, interoperable foundations for embedding governance mechanisms.

### Challenges in Operationalising Techno-Legal AI Governance

- AI-Subject vs AI-User Asymmetry:** In welfare domains such as healthcare, education, and public safety, affected individuals are often AI subjects, not users.
  - AI subjects usually **lack awareness, consent, or effective means** to contest algorithmic decisions, increasing risks of exclusion and injustice.
- Deepfake Governance Limitations:** Content-level takedowns are insufficient, as deepfakes operate through distributed pipelines involving generation tools, platforms, bots, and infrastructure providers.
  - Rapid re-upload, domain migration, and cross-platform amplification weaken conventional enforcement.
- Cost Constraints:** Techno-legal compliance imposes high costs on firms due to audits, security upgrades, skilled personnel, and data infrastructure.
- Legal and Operational Misalignment:** Rapidly evolving laws on data protection, IP, and AI governance create uncertainty in implementation.

### Way Ahead

- AI-Subject-Centric Governance:** Mandate algorithmic impact assessments, proactive disclosure of AI use, and human-in-the-loop mechanisms at critical decision points.
  - Establish grievance redressal systems** and regular demographic audits for subject-facing AI applications.

- **Deepfake Regulation:** Adopt content provenance mechanisms such as mandatory labeling, persistent identifiers, and cryptographic metadata.
  - ♦ Impose infrastructure-level obligations like usage logging, repeat-offender detection, and coordinated incident reporting.
- **Capacity Building:** Invest in interdisciplinary training, shared testing environments, and open-source risk assessment tools.

Source: PIB

## WALKOUTS BY GOVERNORS TEST CONSTITUTIONAL LIMITS

### Context

- Recent walkouts by Governors in Karnataka, Tamil Nadu, and Kerala during state assembly sessions have sparked constitutional debates over **gubernatorial discretion versus elected governments' authority**.
  - ♦ These incidents test the limits of **Article 176 (Governor's mandatory address)** and **Article 163 (aid and advice of Council of Ministers)**.

### About the Governor

- The governor is the **chief executive head** of the state and is appointed by the **President by warrant under his hand and seal**.
- It has an **independent constitutional office** and is not under the control of or subordinate to the Union government.

### Constitutional Position of the Governor

- **Article 176(1)** states that the Governor "shall" address the Legislative Assembly (or both Houses where a Legislative Council exists) at the commencement of the first session each year.
  - ♦ The address serves to **inform the Legislature of the causes of its summons**, reflecting the policy priorities of the elected government.
  - ♦ The address is not the personal opinion of the Governor, it represents the **aid and advice of the Council of Ministers**, making it a formal executive function, not a discretionary one.

### Key Powers of the Governor

- **Executive Powers:** He **appoints the chief minister and other ministers**. They also hold office during his pleasure.
  - ♦ He can recommend the imposition of **constitutional emergency** in a state to the president. During the period of the **President's rule (Article 356)** in a state, the governor enjoys extensive executive powers as an agent of the President.

- ♦ Dr. Ambedkar envisioned the Governor as a non-partisan people's representative, not an independent executive.
- **Legislative Powers:** Under **Article 200**, when a bill is sent to the governor after it is passed by state legislature, he can;
  - ♦ **Grant Assent:** The Governor may approve the bill, making it a law.
  - ♦ **Withhold Assent:** The Governor may reject the bill, effectively stopping it from becoming law.
  - ♦ **Return the Bill for Reconsideration:** The Governor can send the bill back to the legislature with suggestions. However, if the legislature passes the bill again without modifications, the Governor is bound to give assent.
  - ♦ **Reserve the Bill for Presidential Assent:** If the bill is contrary to the Constitution, affects the powers of the High Court, or contradicts central laws, the Governor may reserve it for the President's decision.

### Concerns

- **Erosion of Constitutional Mandate:** The Governor's selective reading or walkout from the address under **Article 176(1)** violates the mandatory nature of the provision and undermines the constitutional scheme envisaging a formal communication between the elected government and the Legislature.
- **Threat to Parliamentary Sovereignty:** Expanding discretion in routine executive functions creates the danger of the Governor acting as a parallel authority, which the Supreme Court has repeatedly warned would hollow out parliamentary democracy.

### Supreme Court's Jurisprudence on Governor's Role

- In **Shamsher Singh vs State of Punjab (1974)**, the Court established that the Governors are formal heads who must act on the aid and advice of the Council of Ministers, not independent authorities.
  - ♦ The Court observed that for such a functionary to publicly criticize settled Cabinet policy is an "unconstitutional faux pas" violating the parliamentary system.
- In the **Nabam Rebia & Bamang Felix v. Deputy Speaker (2016)** case, the Court ruled that the Governor is a formal head and, under **Article 163**, must act on the aid and advice of the Council of Ministers, with discretion limited only to specific constitutional provisions.

- In the **State of Tamil Nadu v. The Governor of Tamil Nadu (2025)**, the court held that gubernatorial discretion cannot negate or obstruct a responsible elected government.

#### Way Ahead

- **Strengthening cooperative federalism:** Institutional mechanisms, such as regular consultation between Governors and State governments, could reduce friction.
- **Adherence to Constitutional Text and Conventions:** Governors should act strictly in accordance with the Constitution and well-established conventions, particularly in matters relating to assent to Bills and addressing the Legislature.
- **Revisiting Sarkaria and Punchhi Commission recommendations:** Both commissions stressed the need for Governors to act impartially and within constitutional limits.

Source: TH

## FOURTH INDUSTRIAL REVOLUTION

### Context

- The World Economic Forum (WEF) will establish five new Centres for the Fourth Industrial Revolution, including one in India's **Andhra Pradesh**.

### Fourth Industrial Revolution (4IR) Network

- The Fourth Industrial Revolution Network is a global platform for **multi-stakeholder collaboration** involving governments, industry, academia and civil society.
- It was launched by the **World Economic Forum in 2017** to ensure that emerging and exponential technologies deliver societal benefits while minimising risks.
- The focus areas of these centres would include **AI innovation, the energy transition, cyber resilience, and frontier technologies**.
- Existing centres span **Europe, the Middle East, Asia and the Americas**, reflecting region-specific priorities within a global governance framework.

### Newly Announced Centres

- **European Centre for AI Excellence, Paris (France):** Aims to enhance Europe's global competitiveness through sovereign and trustworthy AI.
- **Centre for AI-Driven Innovation, London (United Kingdom):** Explores AI convergence with frontier technologies such as quantum and biotechnology.

- **Centre for Frontier Technologies, Abu Dhabi (UAE):** Concentrates on quantum technologies, robotics and space, with strong public-private collaboration.
- **Centre for Intelligent Future, Abu Dhabi (UAE):** Focuses on linking frontier AI research with economic and societal challenges.
- **Centre for Energy and Cyber Resilience, Andhra Pradesh (India):** Promotes innovation in energy transition and strengthens cyber resilience across industries.

### Global Significance

- **Strengthens international cooperation** on responsible adoption of emerging technologies.
- **Enables sharing of regional insights** to address global technology challenges.
- **Supports governments** in developing adaptive, future-ready regulatory frameworks.
- Reinforces the role of **technology as a driver of inclusive growth** and sustainable development.

### Fourth Industrial Revolution (4IR)

- The Fourth Industrial Revolution (4IR) refers to a new phase of technological transformation in which the physical, digital and biological worlds are increasingly converging.
- Unlike earlier revolutions that were driven by a single breakthrough, 4IR is powered by the simultaneous, rapid advancement and fusion of multiple technologies.

### Navigating the next industrial revolution

Revolution	Year	Information
	1	1784 Steam, water, mechanical production equipment
	2	1870 Division of labour, electricity, mass production
	3	1969 Electronics, IT, automated production
	4	? Cyber-physical systems

Source: TH

## GOVERNMENT TO LAUNCH VEHICLE-TO-VEHICLE (V2V) SAFETY TECHNOLOGY

### Context

- The government is planning to launch **Vehicle-to-Vehicle (V2V)** safety technology to **prevent road accident deaths and reduce traffic**.

### Vehicle-to-Vehicle (V2V) Technology

- **V2V is a wireless technology** that will enable the **vehicles to communicate or talk with one another** to share real-time information like **speed, location, acceleration, braking, etc.**
  - ♦ It is the **sub-category of Vehicle-to-Everything (V2X)** and comes under the umbrella of the **Intelligent Transport System.**
- The system is **similar to the aviation sector technology**, where aircraft broadcast their position, speed, altitude, and the nearby aircraft and ground stations receive it.
  - ♦ V2V is working in a few countries, mostly developed nations.
- **How will it work?**
  - ♦ The V2V system will be **installed in cars** so that the **nearby vehicles can exchange information** among vehicles wirelessly.
  - ♦ It will **alert the driver** about the black spots, obstacles, parked vehicles on roadsides, fog or any potential threats.
  - ♦ Usually, V2V systems have a **range of 300 metres** and can detect vehicles in this range.
- **Concerns:** Limited frequency bands may not support all vehicles, and miscommunication could cause accidents.
  - ♦ The system also stores vast amounts of sensitive vehicle and driver data, raising privacy and misuse concerns.
  - ♦ Additionally, cyberattacks could compromise control of the system, posing serious security risks.
- The government has **not yet announced any specific date** for rolling out this system.

### Road Accidents in India

- **India ranks first** globally in terms of the number of annual road accident fatalities.
  - ♦ Its numbers are far ahead of **second and third-ranked countries:** China accounts for just 36% of India's total road deaths, and the United States for 25%.
- The number of road accident fatalities in India **rose 2.3% to over 1.77 lakh in 2024**, resulting in the death of **485 persons every day.**
- **As per the World Road Statistics 2024**, the fatality rate per lakh population is 4.3 in China, and 12.76 in the United States of America, as compared to India, where it is 11.89.

#### Do you know?

- **In September 2020**, the UN General Assembly launched the **Decade of Action for Road Safety 2021-2030** which aims to reduce road traffic deaths and injuries by **at least 50% by 2030.**

- The 2nd Global High-Level Conference on Road Safety was held in **Brazil**, which declared **2011-2020 as the 1st decade of action for Road Safety.**
  - ♦ In the **Brasilia Declaration**, the participating countries set targets under the **Sustainable Development Goals** and pledged to reduce road crash fatalities by **50% in the next 5 years.**

### Government Initiatives

- **National Road Safety Policy India, 2010:** It emphasized the need for better road infrastructure, stricter enforcement of traffic rules, enhanced emergency medical services, public awareness campaigns, and improved post-crash care.
- **Electronic Detailed Accident Report (e-DAR)/ Integrated Road Accident Database (iRAD):** Centralized system for reporting, managing, and analyzing road accident data to improve safety.
- **Speedy Assistance to Accident Victims:**
  - ♦ Award ₹25,000 for Good Samaritans who help accident victims.
  - ♦ Faster compensation: ₹2.5 lakh for grievous hurt, ₹5 lakh for death.
  - ♦ Enhanced compensation for hit-and-run victims: ₹2 lakh for death, ₹50,000 for grievous hurt.
  - ♦ Simplified procedures for third-party insurance, including hired drivers.
- **Vehicle Fitness:** Old, unfit vehicles contribute to accidents. The Ministry is setting up model Inspection and Certification Centers across States/UTs (28 States/UTs covered by 2024).
- **IIT Madras Collaboration:** Establishing a Center of Excellence for Road Safety to develop new products, conduct research, and promote safety initiatives.
- **Accident Blackspot Rectification:** Priority on identifying and improving accident-prone spots on National Highways through engineering measures.
- **Road Safety Audits:** Mandatory audits for all highway projects at design, construction, and operation stages.
- **Brasilia Declaration:** India was one amongst the initial 100+ countries to have signed the Brasilia Declaration in 2015 committing to achieve the Sustainable Development Goal 3.6 i.e. to half the number of global deaths and injuries from road traffic crashes by 2030.
- **Motor Vehicles Amendment Act, 2019:** The act brought about higher penalties for traffic violations, including speeding, drunk driving, and not wearing helmets or seat belts.

**Way Ahead**

- Vehicle-to-Vehicle communication systems are working in a few countries. This will have a significant impact on road safety.
- Like India, countries like the UAE, Saudi Arabia, Brazil, Mexico, etc., are in early pilot stages to roll out V2V communication systems.
- India has done substantial research on road safety through premiere institutions like Indian Institute of Technology (IITs) and Central Road Research Institute (CRRRI).
  - ♦ The government can collaborate with these institutes to improve policies and action plans.

Source: IE

**NEWS IN SHORT****POLAR VORTEX****Context**

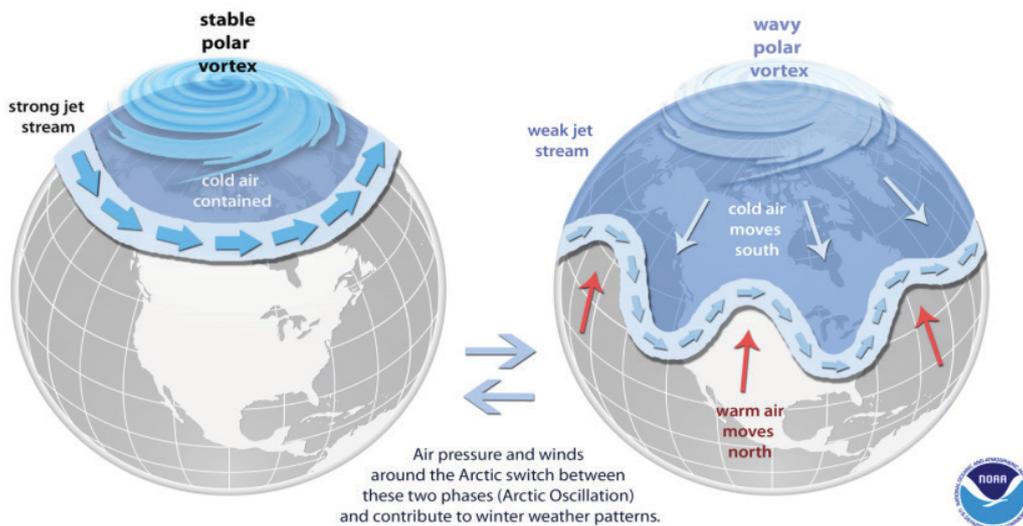
- A powerful winter storm has been fueled by the **activity of the polar vortex** in the US triggering heavy snow.

**About**

- The polar vortex is a **large area of low-pressure and cold air** that swirls like a wheel around both of the **Earth's polar regions**.

**The Science Behind the Polar Vortex**

The polar vortex is a large area of low pressure and cold air surrounding the Earth's North and South poles. The term vortex refers to the counterclockwise flow of air that helps keep the colder air close to the poles (left globe). Often during winter in the Northern Hemisphere, the polar vortex will become less stable and expand, sending cold Arctic air southward over the United States with the jet stream (right globe). The polar vortex is nothing new — in fact, it's thought that the term first appeared in an 1853 issue of E. Littell's *Living Age*.



- **There are two types of polar vortex:** tropospheric and stratospheric.
- **The tropospheric polar vortex** occurs at the lowest layer of the atmosphere; it extends from the surface up to about **10 km to 15 km** where most weather phenomena occur.
- **The stratospheric polar vortex** occurs at around **15 km to 50 km high**.
  - ♦ Unlike the tropospheric polar vortex, **the stratospheric polar vortex disappears during the summer** and is the strongest during the autumn.
- **As this system weakens**, some of the cold, arctic air can break off and migrate south, **bringing plenty of cold air with it**.

Source: IE

**INDIAN RAILWAYS DEPLOYS HUMANOID ROBOT 'ASC ARJUN'****In Context**

- Indian Railways has deployed a humanoid robot named 'ASC ARJUN' at Visakhapatnam Railway Station.

**About**

- ASC ARJUN is a humanoid robot that works with the Railway Protection Force (RPF) for security, surveillance and assistance at the station.

**Impact of the Polar Vortex**

- **The US, parts of Europe, and Asia** experience **chilly winds** when the **polar vortex at the North Pole weakens** and travels from its usual position.

- It is fully designed and developed in Visakhapatnam using indigenous, home-grown technology by a dedicated technical team.

#### Significance

- Enhance safety and security of passengers at a busy station.
- Optimise manpower by taking over routine patrolling and monitoring tasks so RPF staff can focus on critical work.
- Use emerging technologies (AI, IoT, robotics) to improve service delivery and modernise rail operations.

Source: PIB

## SHRI NARAYAN RAMACHANDRAN COMMITTEE

#### In News

- The PFRDA has constituted the Committee for **Strategic Asset Allocation and Risk Governance (SAARG)** chaired by **Narayan Ramachandran** to review the National Pension System (NPS) investment guidelines.

#### About

- The committee will review and modernise NPS investment guidelines for both Government and Non-Government sectors so that returns, risk and long-term security for subscribers are better balanced.
- It aims to align NPS with global pension standards, changes in Indian financial markets, and the evolving needs of long-horizon investors like government employees and private sector subscribers.

#### Main tasks

- **Foundational review & benchmarking:** Examine whether current rules (caps, exposure norms, valuation, etc.) are adequate and compare them with large foreign pension systems (e.g., Canada, Netherlands).
- **Asset classes & diversification:** Reassess equity, debt, money market and recommend new asset classes (like REITs/InvITs, certain alternatives) to improve diversification and resilience to shocks.
- **Strategic asset allocation:** Suggest optimal mixes between equity and fixed income, with prudential limits to protect conservative savers while giving growth potential to younger subscribers.
- **Performance & accountability:** Rework benchmarks, evaluation frameworks and

disclosure so that Pension Funds are judged fairly on risk-adjusted performance and are more accountable for under/over-performance.

- **Risk & ALM (asset-liability management):** Propose comprehensive frameworks for market, credit, liquidity and operational risk, linked explicitly to long-term pension liabilities rather than just short-term NAV moves.

Source: TH

## AGARWOOD

#### In News

- The Union Minister laid the foundation stone of the **₹80 crore Agarwood Value Chain Development Scheme** in Tripura.

#### About Agarwood

- **Agarwood** is a rare, highly fragrant wood that forms inside certain trees (Aquilaria) when they get infected or wounded, and the tree produces a **special dark resin as a defence**.
- This **resin-rich wood** is then used to make **high-value perfume oils (oud), incense and traditional medicines**, and is traded globally, especially in West Asia and East Asia.
- It is mainly **found in tropical, high-rainfall regions of South and Southeast Asia, including Tripura** and other parts of Northeast India, where the climate and soils suit Aquilaria trees.
- Only a small share of trees naturally develop resin, and it can take decades, which is why agarwood is rare and expensive.

Source: PIB

## AMMONIUM NITRATE

#### In News / Context

- Security agencies seized 10,000 kg of ammonium nitrate ahead of Republic Day celebrations.

#### About Ammonium Nitrate

- Ammonium nitrate is a **white, crystalline chemical compound (NH<sub>4</sub>NO<sub>3</sub>)** that serves as both a high-nitrogen fertilizer for agriculture and a key ingredient in industrial explosives when mixed with fuel oil (like ANFO).
- It's **highly soluble in water** and acts as a strong oxidizer, providing oxygen to fuel rapid combustion but doesn't explode on its own.
- Its **dual-use nature creates risks:** while vital for farming (supplying 34% nitrogen to crops) and mining, it can be diverted to make powerful improvised explosive devices (IEDs).

- India tightly controls it under the **Explosives Act, 1884 and Ammonium Nitrate Rules, 2012**, mandating licenses for production, storage, transport and sales.

Source: PIB

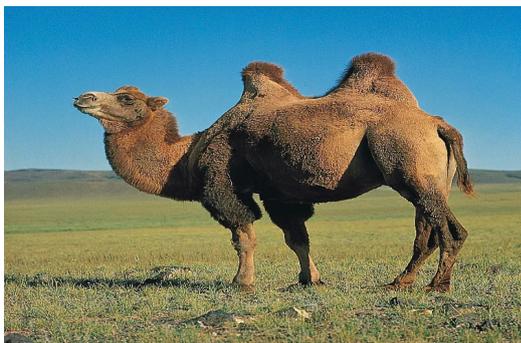
## BACTRIAN CAMELS

### Context

- Two majestic Bactrian camels named **'Galwan' and 'Nubra'**, were showcased at the Republic Day Parade on Kartavya Path.
  - 'Galwan' and 'Nubra' are named after places in the **cold desert of Ladakh**, the only place in India where this species is found.

### Bactrian camels (*Camelus bactrianus*)

- The name "Bactrian" comes from a region (former kingdom conquered by Alexander the Great) located between Afghanistan, Iran, and Kazakhstan.
- It is a **double-humped camel**, also called the **Asian or Mongolian camel** and is listed as **Critically Endangered** on the **IUCN Red List**.
- It is mainly found in Northern Pakistan, Iran, Turkey, India, with the largest domestic population in China.
- Bactrian camels are considered **omnivorous**; however, they are **primarily herbivorous, feeding on a wide selection of vegetation**, even those that other animals might refuse, such as thorny, tough, or dry plants.
- Bactrian camels, known as the 'Ships of the Silk Road', were crucial for crossing the harsh trade routes of Central Asia.



Source: DTE

## JEEVAN RAKSHA PADAK AWARDS

### In News

- The President of India has approved the conferment of the **Jeevan Raksha Padak Series of Awards–2025** on 30 individuals for displaying exceptional courage in saving human lives.

### About

- The Jeevan Raksha Padak series are **civilian life-saving gallantry awards** that honour people who risk their own lives to save others in emergencies like drowning, fires, accidents, electrocution, mine incidents or natural calamities.
- It **started in 1961 as a civilian offshoot of the Ashoka Chakra** series to recognise brave, humane acts by ordinary people.
- Its aim is to **reward civic courage, altruism and humanitarian values** when someone voluntarily puts themselves in danger to save another person.
- It is **open to all people**, any gender, any profession; can also be given posthumously.
- It is of three categories:
  - Sarvottam Jeevan Raksha Padak:** For saving life in situations of very great danger to the rescuer.
  - Uttam Jeevan Raksha Padak:** For courage and prompt action in situations of great danger.
  - Jeevan Raksha Padak:** For courageous, quick action where there is serious risk of bodily injury to the rescuer.
- Each award consists of a medal and certificate, plus a one-time cash amount (approximately: Sarvottam – ₹2 lakh, Uttam – ₹1.5 lakh, Jeevan Raksha – ₹1 lakh).

Source: PIB

## PADMA AWARDS

### In News

- On the eve of Republic Day, President Droupadi Murmu approved the conferment of 131 Padma Awards.

### About

- The awards **instituted in 1954** initially as a single class, they were restructured in 1955 into the current three levels.
- Padma Awards are among **India's highest civilian honours**, recognising exceptional contributions across diverse fields like art, social work, science and public affairs.
- They are presented in **three categories, Padma Vibhushan** (topmost for extraordinary service), **Padma Bhushan** (high-order service), and **Padma Shri** (distinguished service)—with Bharat Ratna as the nation's supreme civilian award above them.
- The number of awards is capped at 120 per year (excluding posthumous and foreigners).

**Eligibility and Process**

- Open to all persons, including citizens, foreigners / NRI / PIO / OCI & posthumous awards allowed in highly deserving cases.
  - ♦ Government servants, including PSU employees are not eligible except Doctors and Scientists.
- Nominations go to a **Padma Awards Committee (chaired by Cabinet Secretary)**, whose recommendations reach the Prime Minister and President for approval.
- Cannot be used as titles (**per Article 18(1) and 1996 Supreme Court ruling**) and higher awards require a 5-year gap from prior ones.

Source: PIB

