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CLIMATE CRISIS HAS INTENSIFIED MARINE HEATWAVES ACROSS THE WORLD

In News

- In January 2025, marine heatwaves (MHWs) in Western Australia led to the death of over 30,000 fish.

What are Marine Heatwaves?

- They are periods of extremely high temperatures in the ocean.
- They occur when sea surface temperatures rise 3-4°C above average for at least five days.
 - They can last from weeks to years.
- Climate change** is the primary cause, with 90% of excess heat absorbed by oceans.
 - They have become more frequent, intense, and longer-lasting in recent decades.

Global Presence

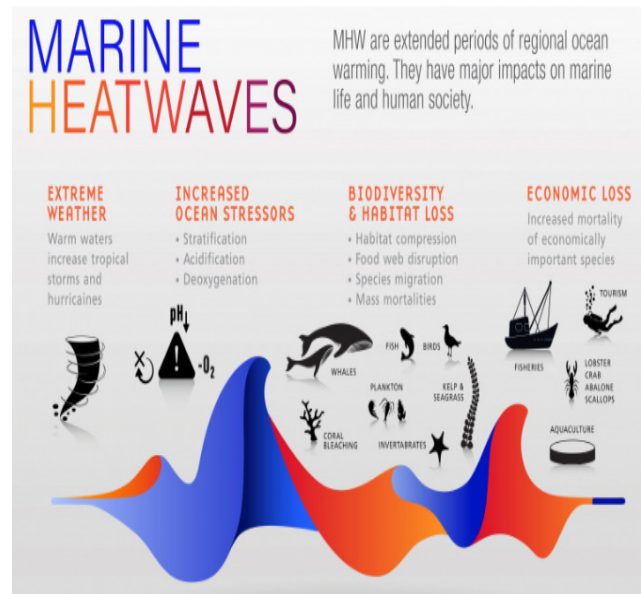
- They are observed in several oceanic regions: North Pacific, North Atlantic, Mediterranean, Caribbean Sea, and parts of the Indian Ocean.
- They can cause extreme weather events, like tropical storms and hurricanes, and disrupt the water cycle, increasing floods, droughts, and wildfires.

Recent Trends in the Indian Ocean

- MHWs, once rare in the tropical Indian Ocean, have become annual events.
- Western Indian Ocean and Bay of Bengal experienced a significant rise in MHWs, with 1.5 events per decade in the western Indian Ocean and 0.5 events per decade in the Bay of Bengal between 1982-2018.

Impacts

- Monsoons:** MHWs in the western Indian Ocean and Bay of Bengal influence monsoon patterns, causing drying in central India and increased rainfall in southern India.
 - These changes are linked to altered atmospheric circulation driven by the heatwaves.
- Socio-economic:** MHWs negatively affect coastal communities, aquaculture, fisheries, and tourism.
 - They can reduce productivity of important species like lobster, snow crab, and scallops.
 - Disruption of ecosystems can harm the fishing industry and related livelihoods.



- Biodiversity and Ecosystem Destruction:** MHWs can cause mass mortality of marine species, forcing them to relocate or change behavior.
 - Ecosystems, such as kelp forests and coral reefs, are especially sensitive to MHWs.
 - MHWs contribute to coral bleaching, reducing coral reproductive ability and making them more vulnerable to disease.
 - Other threats, like ocean acidification and overfishing, compound the damage caused by MHWs.

Strategies to Combat MHWs

- Slow down ocean warming** by reducing fossil fuel emissions (aligning with Paris Agreement goals).
- Invest in nature-based solutions** and apply the IUCN Global Standard for Nature-based Solutions.
- Build research capacity** to monitor MHWs, understand their impacts, and predict future events.
- Develop global research networks** (e.g., Marine Heatwave International Group).

Way Ahead

- Governments should implement protective measures, such as marine protected areas, to safeguard vulnerable species.
 - Enforce fishing regulations and catch management to limit economic losses.
 - Raise awareness among stakeholders, including policymakers, researchers, and the private sector.

Source :IE

ROLE OF GOVERNOR OVER ASSENTING BILLS

Context

- Recently, the Supreme Court questioned the Tamil Nadu Governor over his decision to keep several Bills pending for over three years.

About

- The **Governor**, as the constitutional head of a state, plays a crucial role in the legislative process, particularly in **assenting to bills passed by the state legislature**.
- The discretion exercised by Governors in withholding or delaying assent has been a subject of legal scrutiny and political contention.

Constitutional Provisions

- Article 200 of the Indian Constitution:** It outlines the Governor's role in the assent process.
 - When a bill is presented to the Governor after being passed by the State Legislature, they have four options:
 - 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.
- Article 201: President's Role in Reserved Bills**
 - If a bill is reserved for the President's consideration under Article 200, the President has two options:
 - Give Assent:** The bill becomes law.
 - Withhold Assent or Direct Reconsideration:** The President may send the bill back to the State Legislature for reconsideration. If the Legislature re-passes the bill, the President is not bound to give assent.

Controversies and Recent Developments

- Delays in Assent:** While the **Constitution does not specify a timeframe** for the Governor to act on a bill, it mandates that actions should be taken **'as soon as possible'**.

- Indefinite delays can lead to a constitutional impasse, undermining the democratic process.
- Instances of prolonged delays and the use of the **'pocket veto' (withholding assent without returning the bill)** have raised concerns about the Governor's impartiality and adherence to constitutional norms.
- Political Disputes:** Some state governments have accused Governors of acting under the influence of the central government, undermining the **principles of federalism**.
 - In states like West Bengal, Maharashtra, and Punjab, conflicts have arisen over the Governor's refusal to sign bills crucial for governance.

Supreme Court Observations/Interpretations

- Shamsher Singh v. State of Punjab (1974):** Governor is bound to act on the aid and advice of the **Council of Ministers** except in certain specified cases.
- Nabam Rebia v. Deputy Speaker (2016):** Governor cannot act in a partisan manner or override the elected government's decisions without valid reasons.
- Rameshwar Prasad Case (2006):** Governor's discretion should not be arbitrary and must align with constitutional principles.

Discretionary Powers

- The Governor's discretion in withholding assent or returning a bill is **not absolute**.
- The **Sarkaria Commission (1987)** further emphasized that the reservation of bills for the President's consideration should be an exception and not the norm.
 - It recommended that the President should decide on such bills within six months and communicate reasons if assent is withheld.

Reforms and the Way Forward

- Time-bound decision-making:** The Supreme Court has hinted that Governors should not indefinitely delay assent.
 - The Governor should communicate promptly with the state legislature, providing reasons for withholding assent or referring bills to the President.
- Clarification on discretionary powers:** A clearer constitutional or judicial framework is needed to define the limits of the Governor's role.
 - Establishing clear guidelines for the Governor's actions in assenting bills can help ensure transparency and accountability.

- **Greater accountability:** The Governor's actions should be subject to parliamentary or judicial review if they appear to be politically motivated.
 - ♦ Strengthening judicial oversight can help prevent misuse of the Governor's powers and ensure adherence to constitutional principles.

Source: TH

STATES DEMAND FOR INCREASE SHARE IN CENTRAL TAXES

Context

- Odisha has joined the growing demand for the Finance Commission to raise States' share in India's divisible tax pool to 50%, from about 41% currently.

What is Tax devolution?

- Tax devolution refers to the **distribution of tax revenues** between the central government and the state governments.
- The central government collects taxes (like income tax, GST, etc.) and a portion is shared with the states based on the **Finance Commission's** recommendations.
 - ♦ **Objective:** To promote fiscal federalism, strengthen the financial autonomy of state governments, and empower them to meet the needs of their respective populations.
- **Formula Used:** States' share is decided by a formula meant to incentivize demographic performance and each state's effort to mobilize its own tax revenue.
 - ♦ The formula also takes into account geographic area, forest cover and the state's per capita income.
- The Centre also aids States through additional grants for certain schemes that are jointly funded by the Centre and the States.

Constitutional Provisions Related to Centre State Financial Relations

- **Articles 202 to 206** deal with the financial administration of states, including provisions related to their budget, expenditure, borrowing, and taxation powers.
- **Articles 268 to 272** outline the distribution of revenues between the Union and the states.
- **Article 280** provides for the establishment of a Finance Commission every five years (or as specified by the President).
- **Article 282** allows the Union government to provide financial assistance to states for any public purpose.

Current Share of the States

- **Recommendations of the 14th FC:** It hiked the tax devolution to states to 42% from 32%, and also added a new provision of revenue deficit grants to states facing any resource gap.
- **The 15th finance commission**, under the chairmanship of N K Singh has revised tax devolution and brought it down to 41% from 42%.
 - ♦ So the current tax devolution to states stands at 41% till 2026.
 - ♦ **The 90:10 rule** is still applicable to the northeastern and hill states, although there is no special status category.
 - ♦ All the other states receive Central funding in a **60:40 ratio**, 60% being the Central government's contribution and 40% states.

Concerns of the States

- **Demand for more funds:** States argue they should receive more funds than recommended by the Finance Commission.
 - ♦ States argue that they have greater responsibilities, including education, healthcare, and policing services.
- **Disparities Among States:** Developed States like Karnataka and Tamil Nadu feel they receive less money from the Centre than they contribute in taxes.
 - ♦ It is argued that more developed States with better governance are being penalized by the Centre to help States with poor governance.
- **Divisible Pool Concerns:** Cesses and surcharges, which are not shared with the States, can constitute up to **28%** of the Centre's tax revenues, leading to revenue losses for States.

Way Ahead

- **The 16th Finance Commission** should review the States' demand for a higher tax devolution based on fiscal needs and expenditure responsibilities.
- **Strengthening Disaster Resilience Funding:** A separate central disaster relief fund could be established for disaster-prone States to ease their financial burden.
- **Capacity Building:** Strengthening the financial management and capacity of states to better utilize devolved funds for development.

Source: TH

PRIVATE SECTOR INVOLVEMENT IN INDIA'S NUCLEAR SECTOR

Context

- The Union government is considering allowing private sector participation to achieve 100 GW of nuclear power capacity by 2047.

About

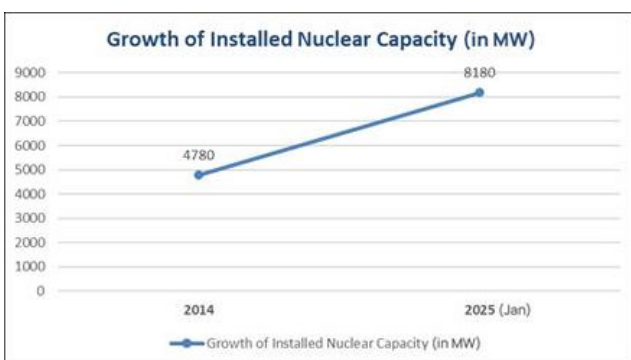
- Traditionally, nuclear power plants in India have been owned and operated only by state-owned **Nuclear Power Corporation of India Ltd (NPCIL)** and its fully-owned subsidiary **Bharatiya Nabhikiya Vidyut Nigam (BHAVINI)**.
- To allow private sector participation government has proposed amendments to key legislations;
 - Atomic Energy Act, 1962**, a framework for nuclear energy development and regulation.
 - Civil Liability for Nuclear Damage Act, 2010**, ensuring compensation mechanisms for nuclear incidents.
- The government will enter into partnerships with the private sector with the motive of;
 - Setting up **Bharat Small Reactors**,
 - Research & development of **Bharat Small Modular Reactor**, and
 - Research & development of newer technologies for nuclear energy.

What is Nuclear Energy?

- Nuclear energy is the **energy released during nuclear reactions**, either through fission (splitting of atomic nuclei) or fusion (merging of atomic nuclei).
- In nuclear fission**, heavy atomic nuclei, such as those of uranium or plutonium, are split into lighter nuclei, releasing a large amount of energy.
 - This process is utilized in nuclear power plants to generate electricity.

Status of Nuclear power capacity in India

- The current installed nuclear power capacity in the country is **8,180 MW**, spread across **24 nuclear power reactors**.
- Capacity Expansion:** 10 new reactors (totaling 8 GW) under construction across Gujarat, Rajasthan, Tamil Nadu, Haryana, Karnataka, and Madhya Pradesh.
 - Approval for a 6×1208 MW nuclear plant in Andhra Pradesh in collaboration with the USA.



Benefits of Private Sector Involvement

- Faster Capacity Expansion:** Private investment will help bridge the financial gap needed for rapid nuclear power growth.
- Technological Advancement:** Collaboration with private companies drive innovation and bring in global expertise.
- Cost Efficiency:** Competitive bidding and private participation will help reduce project costs and delays.
- Energy Security:** Increased nuclear power generation helps India reduce dependence on fossil fuels and meet clean energy goals.

Concerns to Private Sector Entry

- Regulatory Hurdles:** Amendments to existing laws are required to enable private sector participation.
- High Capital Requirement:** Nuclear power projects involve long gestation periods and large upfront investments, which deters private players.
- Liability Concerns:** The Civil Liability for Nuclear Damage Act imposes high liability on operators, making private investment risky.
- Safety and Security:** Nuclear energy requires strict safety protocols, and allowing private firms to operate reactors necessitates robust regulatory oversight.
- Public Perception:** Concerns over nuclear safety, waste management, and radiation risks will face public resistance.

Government steps

- India had announced a **Rs 20,000 crore** R&D mission for development of **small modular reactors (SMRs)**.
 - India is also targeting the deployment of at least five of these indigenously developed reactors by 2033.
- NPCIL and National Thermal Power Corporation (NTPC)** have signed a supplementary Joint Venture agreement to develop nuclear power facilities in the country.

Way Ahead

- Clear Regulatory Framework:** Establish a robust regulatory environment to ensure safety, compliance, and transparency, addressing concerns about accountability and national security.
- Public-Private Partnerships (PPPs):** Promote partnerships where the government maintains oversight, while private players handle operations, innovation, and investment, ensuring a balance of interests.

- **Gradual Implementation:** Start with pilot projects and small-scale initiatives to test private sector involvement, ensuring risk management before large-scale implementation.

Source: IE

INDIA'S DIAGNOSTICS SECTOR

Context

- **India's diagnostics sector** plays a **crucial role in the healthcare industry**, facilitating early disease detection and treatment planning.
- The tragic case of **Shankar Dhange**, whose sister lost her life due to incorrect diagnostic test results, underscores the **serious risks posed by inadequate regulation and oversight**.

India's Diagnostics Sector: Growth and Importance

- The diagnostics sector contributes **9% of the total healthcare industry** and plays a crucial role in **disease management and medical decision-making**.
- The Indian diagnostics industry is expanding **at a rapid pace**, with an estimated value of **₹1,275 billion by 2028**.
- There are **approximately 300,000 labs across India**, serving a growing population.
- The **early disease detection** with the rise of **digital health platforms and AI-driven diagnostics** is shaping the future of medical testing in India.

Challenges Facing the Diagnostics Sector

- **Weak Regulatory Oversight:** Only **12 states and Union Territories** have adopted the **Clinical Establishments Act**, leading to **inconsistent regulations across the country**.
 - ♦ **No mandatory accreditation** for labs, allowing many to operate **without standardized quality control**.
- **Shortage of Skilled Personnel:** **Lack of trained pathologists, microbiologists, and lab technicians** affects diagnostic accuracy.
- **Urban-Rural Divide:** Only **24% of diagnostics revenue comes from rural areas**, despite **70% of India's population residing there**.
 - ♦ Government-run labs **lack proper infrastructure, funding, and trained staff**.
- **High Cost of Private Diagnostics:** **No standardized pricing for tests**, leading to **disparities in cost**.

- ♦ Private labs often charge **exorbitant fees**, making diagnostic services **inaccessible to low-income groups**.
- ♦ Initiatives like **Telangana's 'T-Diagnostics'** and **Kerala's 'Aardram Mission'** aim to provide affordable diagnostics but face logistical challenges.
- **Fraudulent Practices:** **Fake pathologists and unauthorized technicians** are common, compromising patient safety.
 - ♦ Some labs use **"bought signatures"** of **pathologists** to issue reports **without proper review**.

Regulations of the Sector

- **Clinical Establishments (Registration and Regulation) Act, 2010:** Aims to **regulate diagnostic centers** and set minimum standards for services.
 - ♦ Adopted by **only 12 states and Union Territories**, with poor implementation.
- **NABL Accreditation:** The **National Accreditation Board for Testing and Calibration Laboratories (NABL)** provides voluntary accreditation.
 - ♦ Large diagnostic chains follow NABL guidelines, but **many small labs operate without accreditation**.
- **State-Specific Regulations:** **Karnataka and Kerala** have separate regulatory frameworks, but **enforcement remains inconsistent**.
 - ♦ Tamil Nadu's new **Clinical Establishments (Regulations) Rules, 2018**, mandate minimum space requirements for labs.

Way Ahead: Reforming India's Diagnostics Sector

- **Strengthening Regulations and Compliance:** **Make NABL accreditation mandatory** for all diagnostic centers.
 - ♦ Ensure **uniform implementation of the Clinical Establishments Act across all states**.
 - ♦ Establish a **central regulatory body** for consistent oversight.
- **Expanding Workforce and Training Programs:** **Increase medical education seats and training programs** for microbiologists, pathologists, and lab technicians.
 - ♦ Mandate **regular upskilling and certification** for lab technicians.
 - ♦ Set a **cap on the number of labs a pathologist can be associated with** to curb ghost pathologists.

- **Eliminating Fraudulent Practices:** Implement **digital tracking of lab reports** to prevent misuse of pathologists' credentials.
 - ♦ Enforce **strict penalties for ghost pathologists and unqualified technicians.**
 - ♦ Conduct **regular audits and surprise inspections** to ensure compliance.
- **Bridging the Urban-Rural Divide:** Increase government investment in rural diagnostic centers.
 - ♦ Expand **public-private partnerships (PPPs)** to improve access to diagnostics in remote areas.
 - ♦ Extend **successful state-funded diagnostic initiatives** like 'T-Diagnostics' and 'Aardram Mission' to other regions.
- **Standardizing Pricing and Quality Control:** Introduce **price caps for essential diagnostic tests.**
 - ♦ Mandate **Standard Operating Procedures (SOPs)** for sample collection, testing, and reporting.
 - ♦ Enforce **external and internal quality control measures.**

Source: TH

NEWS IN SHORT

WESTERN DISTURBANCE

In Context

- The India Meteorological Department (IMD) has reported a sharp temperature drop across North India due to an active western disturbance positioned over North Pakistan.

What is Western Disturbance (WD)?

- It is an **extra-tropical storm** that originates in the **Mediterranean region.**
 - ♦ The disturbance travels from the **"western" to the eastern direction** and gradually travels across the middle-east from Iran, Afghanistan and Pakistan to enter the Indian subcontinent.
 - Disturbance means an area of **"disturbed" or reduced air pressure.**
- Equilibrium exists in nature due to which the air in a **region tries to normalize its pressure.**
 - ♦ In the term "extra-tropical storm", the storm refers to low pressure.
 - "Extra-tropical" means outside the tropics (as WD originates outside the tropical region).

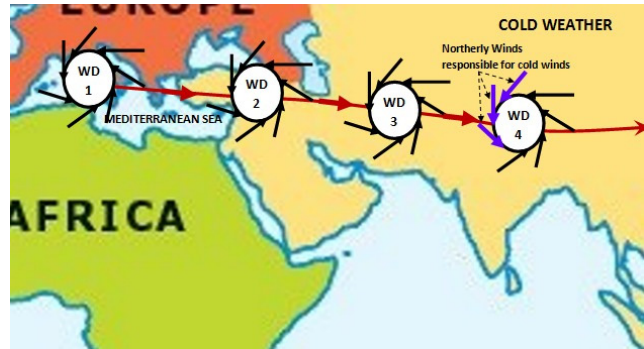


Image Courtesy: Weatherview

Impacts

- It brings **rainfall, snowfall, and fog** to northern India.
- WD is important for the **agriculture of the Rabi crop in the Northern subcontinent.**
- The WD is **not always the harbinger of good weather** and sometimes, they can cause extreme weather events like floods, flash floods, landslides, dust storms, hail storms and cold waves killing people, destroying infrastructure and impacting livelihoods.

Indian Meteorological Department

- Established in 1875.
- The India Meteorological Department is an agency of the Ministry of Earth Sciences of the Government of India.
- It is the principal agency responsible for meteorological observations, weather forecasting and seismology.

Source: PIB

DARIEN GAP

Context

- Darien Gap was in the news for being a major route for the illegal migration to the US.

Darien Gap

- The Darien Gap is a dense, swampy rainforest spanning approximately **97 km (60 miles)** between **northern Colombia in South America and southern Panama in North America.**
- **Environment:** The terrain is characterized by **muddy trails, wetlands, and steep mountains**, making it one of the most inhospitable and dangerous regions in the world.
- **Concerns:** The area is controlled by criminal gangs and armed groups, further increasing the dangers for those attempting to cross it.



Source : IE

POWER TO GRANT FURLOUGHS

In News

Convicts of the Hashimpura massacre have moved the Delhi High Court against a Delhi prison rule about furloughs.

- The rule vests power to grant furlough with the court where the appeal against conviction is pending.

About Furloughs and How is it different from Parole?

- Both furlough and parole are conditional releases, but differ in their implications.
- Furlough** allows convicts to be temporarily released without suspending their sentence, meaning the time spent on furlough counts toward the sentence.
 - It is typically granted to long-term prisoners for reasons like preventing isolation and fostering social ties.
- Parole** suspends a **convict's sentence temporarily** and is usually granted for specific reasons like illness or agricultural needs.
- Delhi Prison Rules 2018:** The challenged rule (Note 2 of Rule 1224) states that furlough cannot be granted if an appeal is pending before the High Court or Supreme Court, and the convict must seek the court's direction.
 - This provision is under scrutiny as it may violate constitutional rights, including Articles 14 (equality) and 21 (right to life and liberty), and may contradict the reformatory approach to punishment.
- High Court's Interpretation:** A single judge of the Delhi HC has interpreted that the rule applies to both the Delhi HC and SC.

- Now, a division bench is examining the rule's constitutional validity and whether it unfairly denies furlough despite good behavior.

Do you know?

- The case of KM Nanavati in 1960 set a precedent where the SC ruled that only the court, not the governor, can suspend a sentence during the pendency of an appeal.
- Some states deny furlough during an appeal, with NALSA highlighting that this is because convicts can request relief from the court.
 - Several states are part of ongoing litigation regarding this practice.

Source : IE

BRUCELLOSIS

In News

- An eight-year-old girl from Kerala recently died after being treated for brucellosis for two months.

About Brucellosis

- It is a bacterial zoonotic disease caused by Brucella species, mainly affecting livestock like cattle, goats, sheep, and swine.
- Transmission** : It is transmitted to humans through contact with infected animals, consumption of unpasteurized milk or cheese, or inhalation of airborne agents.
 - The disease is common in endemic areas and can have serious public health implications.
 - Most cases result from consuming raw milk or cheese, especially from sheep and goats.
- Symptoms** of brucellosis include fever, weakness, weight loss, and general discomfort.
 - In many cases, symptoms are mild, which can delay diagnosis. The incubation period varies from one week to two months, but usually lasts 2-4 weeks.
- Risk Groups:** Farmers, butchers, veterinarians, and laboratory workers are at higher risk due to direct contact with infected animals, blood, or bodily fluids.
- Prevention and Control:** The key strategy is to eliminate infection in animals, including vaccination and culling.
 - Pasteurization of milk and raising awareness about food safety help reduce human infection.
 - Brucellosis is treated with doxycycline combined with streptomycin or rifampicin, typically for 45 days.

Source : TH

CHANDRAYAAN-4 SET TO LAUNCH IN 2027

Context

- India will launch the **Chandrayaan-4** mission to bring back samples of moon rocks to the Earth in **2027**.

About

- Chandrayaan-1:** It was launched in **2008** and was India's first lunar mission. It made India the **fifth country** to reach the Moon.
 - The mission's most significant discovery was the presence of water molecules on the lunar surface, a finding confirmed by NASA.
- Chandrayaan-2:** It was launched in **2019** with an orbiter, a **lander (Vikram)**, and a **rover (Pragyan)**.
 - The mission aimed to achieve a soft landing on the lunar surface, but ISRO lost contact with the lander just before touchdown, resulting in a crash landing.
 - Despite this setback, the orbiter continued functioning and provided crucial data on the Moon's surface and atmosphere.
- Chandrayaan-3,** a follow-on mission to Chandrayaan-2, successfully achieved a soft landing on the **Moon's south pole in 2023**.
 - Lander payloads:** Chandra's Surface Thermophysical Experiment (**ChaSTE**) to measure the thermal conductivity and temperature; Instrument for Lunar Seismic Activity (**ILSA**) for measuring the seismicity around the landing site etc.
 - Rover payloads:** Alpha Particle X-ray Spectrometer (**APXS**) and Laser Induced Breakdown Spectroscopy (**LIBS**) for deriving the elemental composition in the vicinity of landing site.

Source: TH

PINAKA MULTIPLE ROCKET LAUNCH SYSTEMS (MRLS)

In News

- The Union Defence Ministry signed contracts worth ₹10,147 crore for ammunition to enhance the **Army's Pinaka Multiple Rocket Launch Systems (MRLS)**.

About contracts

- The contracts, with Economic Explosives Limited (EEL) and Munitions India Limited (MIL), involve procuring Area Denial Munition (ADM) Type-1 and High Explosive Pre-Fragmented (HEPF)-Mk-1 rockets, respectively.

- These advanced munitions will improve the **Pinaka's range and firepower**.

About Pinaka

- The Pinaka rocket system has been developed by Armament Research and Development Establishment, Pune supported by High Energy Materials Research Laboratory, another Pune-based laboratory of DRDO.
- The Pinaka Mk1** has a range of **38 km** and it can fire a variety of ammunition.
 - The upgraded Pinaka system, which is becoming the Army's primary long-range artillery, has already completed successful flight tests of guided rockets with a **75 km range**, with plans to extend the range to 120 km and 300 km.
 - The Pinaka MLRS can fire 72 rockets in 44 seconds, with four regiments in service and six more ordered.
- Armenia** became the first export customer for the indigenously developed Pinaka with interest expressed by several countries in the system.
 - The Indian Army has four Pinaka regiments in service and six more are on order.

STRYKER INFANTRY COMBAT VEHICLE

In News

- India and the United States continue to deepen their defence cooperation, with the **Stryker Infantry Combat Vehicle (ICV) deal** emerging as a key development.

What is the Stryker?

- The Stryker is a highly mobile, **eight-wheeled armoured infantry combat vehicle** developed by General Dynamics Land Systems (GDLS) in the U.S. and Canada.
- It is designed for **rapid deployment, high-altitude warfare**, and urban combat scenarios, making it a crucial asset for modern battlefields.

Features of Stryker ICV

- Protection and Survivability:**
 - Double V-Hull Design:** Improves **blast resistance** against **landmines and IEDs**.
 - Composite Armour with Ceramic Tiles:** Provides enhanced **ballistic protection** from **small arms fire and shrapnel**.
- Firepower and Combat Capabilities:**
 - 30 mm autocannon** (enhanced firepower for armoured threats).

- ♦ **Optional 105 mm Mobile Gun System (MGS)** for anti-tank capabilities.
- ♦ **Javelin Anti-Tank Guided Missile (ATGM) compatibility** (future upgrades may replace outdated versions).
- **Mobility and Deployment:**
 - ♦ **Top Speed:** 100 km/h.
 - ♦ **Range:** 483 km on a single refuel.
 - ♦ **All-Terrain Capability:** Performs well in desert, jungle, and high-altitude terrains.

Significance for India

- **Improves mobility and protection** of Indian troops in **harsh Himalayan terrains**.
- Strategic deployment in **Ladakh and Arunachal Pradesh** strengthens India's position against **Chinese border threats**.
- The **Make in India initiative** will be supported through **co-production with Bharat Earth Movers Limited (BEML)**.

- Collaboration will likely involve **technology transfer**, reducing India's reliance on foreign defence suppliers.

India-U.S. Defence Collaboration

- **Strengthening Bilateral Defence Ties**
 - ♦ Builds on previous **India-U.S. defence agreements**, including:
 - **General Electric (GE) F414 jet engine technology transfer.**
 - **MH-60R Seahawk helicopters for the Indian Navy.**
 - **P-8I Poseidon surveillance aircraft** for maritime security.
 - **Predator MQ-9B drones** for reconnaissance and strike missions.
 - ♦ Reinforces **India's role as a key strategic partner in the Indo-Pacific.**
 - ♦ Aligns with **QUAD (India, U.S., Japan, Australia)** defence cooperation to counter regional threats.

Source: TH

